Helicopter Safety Advisory Conference

Safety Through Cooperation - Since 1978

Inspection, Maintenance And Operation Of Offshore Helidecks

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Safety Through Collaboration

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Recommended Practices (RP) are published under the direction of the Helicopter Safety Advisory Conference (HSAC). RPs are a medium for discussion of aviation operational safety pertinent to the transmission of product, energy exploration and production industry in the United States. RPs are not intended to replace individual engineering or corporate judgment or to replace instruction in company manuals or government regulations. Adoption of this HSAC RP as a company internal standard is the responsibility of each individual company and is highly recommended. In this HSAC RP the word 'shall' is used to indicate high value safety practices not an imperative command. Companies choosing to adopt practices recommended in this document should be aware that substitution of "shall" to "should" would likely diminish the effectiveness of the practice. HSAC encourages and welcomes suggestions for subject matter relating to this document intended to improve or update practices contained within.

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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*)

The latest version of this document is available in electronic format at: *http://www.hsac.org/library*

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1 SCOPE

It is a responsibility of the offshore facility owner with cooperation of the helicopter operator to provide a safe helideck that meets prescribed design, operational, maintenance and management guidelines. This Recommended Practice (RP) provides a guide for inspection, maintenance, and management of offshore helidecks; including safety and operational guidelines. These guidelines are effective with the publication of first edition of this document issued March, 2019 and replace previously issued HSAC RPs regarding helideck inspection, maintenance, and management.

For helideck design refer to HSAC RP 161 for "New Build Helidecks" after May 2016 and HSAC RP 162 for "Legacy Helideck Marking and Design" inclusive of details for "Assessment, Upgrades, Modification, Replacement and Marking of Existing and Temporary Helidecks" built prior to May 2016. American Petroleum Institute (API) Helideck Design documents (API 2L) are not recognized by HSAC as acceptable for either design of new build helidecks or marking/upgrade of legacy helidecks.

Note: The requirements for mobile offshore drilling units (MODUs) are given in the International Maritime Organization (IMO) Code for the Construction and Equipment of Mobile Offshore Drilling Units (MODU Code) and for ships in International Chamber of Shipping (ICS) Guide for Helicopter/Ship Operations.

2 BACKGROUND

In 2017, the five-year average Gulf of Mexico Oil & Gas industry helicopter accident rate per 100,000 flight hours was reported by HSAC as 0.91. The fatal accident rate per 100,000 flight hours during these five years was 0.35. As every accident is one too many, causal and contributing factors to accidents are being identified and mitigation is developed to prevent re-occurrence. When reviewing accident information since 1999, in the period from 1999 through 2017 there have been 29 accidents of which 7 were fatal (24%), resulting in 15 fatalities and 18 injuries. The causes, not all-inclusive, of the accidents since 1999 are listed below. Among the leading and secondary causes of these events there are 13 related to helideck size or design related issues.

- 21 engine related,
- 25 loss of control or improper procedures,
- 18 helideck obstacle strikes,
- 13 controlled flight into terrain, and
- 12 other technical failures

The data above shows that many of the accidents in the reviewed period had a causal or contributing factor related to helideck design or helideck operations. Additionally, around the world in the oil and gas industry in the last ten years (through 2017) there have been 23 helideck related accidents.

All too often helideck related incidents could have been prevented if proper procedures/guidelines had been followed. For example, pilots' lack of attention or understanding of helideck markings, aircraft strikes of recently installed antennas within the helicopter flight path, or misunderstanding of whether a helideck is open for flight operations. In many cases, helideck markings were not clearly visible or available lighting and signage was disregarded. These are all areas where safety reporting and proper/timely communication of issues are of paramount importance.

Much work has been done by both oil and gas companies and their contractors to develop HSAC RPs in order to provide a holistic set of guidelines to ensure helideck related activities can be conducted safer than ever before in our history. However, it will take a proactive and safety conscious effort by all concerned to realize the benefit of the application of these guidelines. All owners and users of offshore helidecks are encouraged to adopt the recommended practices described in the document. Consideration should be given to performing a risk analysis to substantiate those practices which are not adopted. It is only with this determination and coordination that the O&G industry will be able to achieve 'zero' helideck related incidents.

This HSAC RP together with HSAC RP's 161, 162, 164 and 191 will provide helideck owners and operators with design, operational, maintenance and management guidelines to engineer out the causal factors for these accidents.

3 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
Helicopter Safety Advisory Conference (HSAC)	**HSAC RP 161**	Recommended Practice for New Build Helideck Design Guidelines For all HSAC documents: *http://www.hsac.org/library*
	HSAC RP 162	Recommended Practice for Assessment, Upgrades, Modification, Replacement and Marking of Existing Helidecks
	HSAC RP 164	Helideck Information Plates
	HSAC RP 191	Offshore Helicopter Incident Bowtie
	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 this RP
American Petroleum Institute (API)	**API RP 2 SIM**	Recommended Practice for Structural Integrity Management of Fixed Offshore Facilities For all API Documents: *http://www.api.org/products-and-services/standards/purchase*
	API/IP 1542	Identification Markings for Dedicated Aviation Fuel Manufacturing and Distribution Facilities, Airport Storage and Mobile Fueling Equipment
American Standard for Testing Materials (ASTM)	**ASTM D1655**	Standard Specification for Aviation Turbine Fuels and Standard Test Method for Density, Relative Density (Specific Gravity) *https: https://www.astm.org/Standards/D1655.htm*
American Transport Association (ATA)	**ATA Specification 103**	Standards for Jet Fuel Quality Control at Airports *https://publications.airlines.org/CommerceProductDetail.aspx?Product=251*
British Standard (BS) Institute (BSI)	**BS 4800**	Schedule of Paint Colors for Building Purposes For all British Standards: *https://www.bsigroup.com/en-GB/standards/british-standards-online-database/*
	EN 12079	Standards for Offshore containers and associated lifting sets.
	EN ISO 10855	Periodic Inspection, examination and testing of Offshore containers and lifting sets.
Energy Institute (EI)	**EI 1529**	Aviation Fueling Hose and Hose Assemblies For all EI documents: *https://www.energyinst.org*
	EI 1542	Identification Markings for Dedicated Fuel Manufacturing and Distribution Facilities, Airport Storage and Mobile Fueling Equipment

Organization	Reference #	Title
	EI 1581	Filter separator: EI Specification 1581 Specifications and laboratory qualification procedures for aviation fuel filter/water separators
	EI 1583	Filter monitor: EI 1583 Laboratory tests and minimum performance levels for aviation fuel filter monitors
Federal Aviation Administration (FAA)	**AC 150/5230-4B**	Aircraft Fuel Storage, Handling, and Dispensing on Airports *https://www.faa.gov/airports/resources/advisory_circulars/index.cfm/go/document.current/documentNumber/150_5230-4*
Helideck Certification Agency (HCA)	**Helideck Courses**	Helideck Certification and Courses *http://helideck.agency*
International Air Transport Association (IATA)	**DGR**	Dangerous Goods Regulations *https://store.iata.org*
International Maritime Organization (IMO)	**IMO MODU Code**	Code for Construction and Equipment of Mobile Offshore Drilling Units (MODU Code) *http://www.imo.org/en/Publications/Documents/Newsletters%20and%20Mailers/Mailers/I810E.pdf*
	IMDG Code	International Maritime Dangerous Goods Regulation *http://www.imo.org/en/Publications/IMDGCode/Pages/Default.aspx*
International Chamber of Shipping (ICS)	**ICS Guide**	ICS Guide to Helicopter/Ship Operations *http://www.ics-shipping.org/docs/default-source/publications/safety-security-and-operations/ics-guide-to-helicopter-ship-operations.pdf?sfvrsn=10*
International Civil Aviation Organization (ICAO)	**ICAO Annex 2**	Annex 2 – Rules of the Air, APPENDIX 1 "Hand Signals" *https://store.icao.int/index.php/annexes/2-rules-of-the-air.html*
	ICAO Annex 14 Vol II	Annex 14 Volume II – Heliports *http://store1.icao.int/index.php/annex-14-aerodromes-volume-ii-heliports-4th-edition-july-2013-volume-2-english-printed.html*
	ICAO 9261-AN/903	Heliport Manual - Section "Helidecks
National Fire Protection Association (NFPA)	**NFPA 30A**	Acft Fuel Servicing and Marine Service Station Code for Fuel Storage Tanks For all NFPA documents: *https://www.nfpa.org/Codes-and-Standards/All-Codes-and-Standards/List-of-Codes-and-Standards*
	NFPA 407	Standard for Aircraft Fuel Servicing
	NFPA 418	Standard for Heliports
National Weather Service (NWS)	**SAWS and SAWSII**	Weather Observation Programs *https://www.weather.gov/lch/sawrs2*
Offshore Petroleum Industry Training Organization (OPITO)	**OPITO Standards**	7040 - Helideck Operations Initial Training Standard 7041 - Helideck Emergency Response Team Member (HERTM) Training 7042 - Helideck Emergency Response Team Leader (HERTL) Training 7042 & 7045 - HDA and HERTM Workplace Competence Assessment Standards

Organization	Reference #	Title
		7044 & 7046 - HLO and HERTL Workplace Competence Assessment Standards 7541 - Helideck Emergency Response Team Member (HERTM) Further Training 7542 - Helideck Emergency Response Team Leader (HERTL) Further Training 5095 - HUET – Helicopter Underwater Escape Training (with EBS) For all OPITO documents: *https://www.opito.com/standards-library/opito-standards*
UK Civil Aviation Authority (CAA)	**CAA Paper 2008/03**	Helideck Design Considerations – Environmental Effects *https://publicapps.caa.co.uk/docs/33/2008_03.pdf*
	CAP 437	Standards for Offshore Helicopter Landing Areas *http://publicapps.caa.co.uk/modalapplication.aspx?appid=11&mode=detail&id=523*
	Standard Helideck Monitoring Systems	Standard Measuring Equipment for Helideck Monitoring System (HMS) and Weather Data *http://www.helidecks.org/download%20files/HMS%20Specification%20V9.0%20clean.pdf*
Underwriter Laboratory (UL)	**UL 142**	Flame Shield Double Wall Tanks with 2 Hour Fire Rating *https://standardscatalog.ul.com/standards/en/standard_142*
	UL 2085	Fire Guard Double Wall Tanks with Lightweight Concrete installation Ballistic and impact resistant *https://standardscatalog.ul.com/standards/en/standard_2085_2*
US Regulations	**Code of Federal Regulations (CFRs: 33, 46, 49)**	33 CFR 143.120 *https://www.gpo.gov/fdsys/granule/CFR-2010-title33-vol2/CFR-2010-title33-vol2-sec143-120*
		46 CFR Parts 64 - APPENDIX 2, 107, 108 *https: https://www.gpo.gov/fdsys/granule/CFR-2004-title46-vol2/CFR-2004-title46-vol2-part64*
		49 CFR Parts 173.32, 180 subpart G *https: https://www.gpo.gov/fdsys/granule/CFR-2010-title49-vol2/CFR-2010-title49-vol2-sec173-32*
	USCG - US Coast Guard Standards for helidecks on Mobile Offshore Drilling Units (MODUs) and Floating OCS Facilities. *https://www.dco.uscg.mil/OCSNCOE/Regulations-Policy-Guidance/*	

Table 1: References

4 TERMS, DEFINITIONS, AND ABBREVIATIONS

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

4.1 Terms and Definitions

Term	Definition
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.
Associated Systems	Systems used to support helideck operations such as firefighting, fuel, weather, lighting, etc. Not all are needed for all helidecks.
Aviation Advisor	"Aviation Advisor" refers to an aviation professional from a helicopter operator or oil company.
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.
Conformance/ Conformity	In this RP Conformance or Conformity is linked to the (voluntary) adherence with the standards and guidelines in this RP.
Compliance	In the RP Compliance is linked to regulatory requirements that have to be met.
Corrective Maintenance	Maintenance where equipment is repaired or replaced after wear, malfunction or break down
D-Value	The largest overall dimension of the helicopter when rotors are turning. This dimension will normally be measured from the most forward position of the main rotor tip path plane to the most rearward position of the tail rotor tip path plane (or the most rearward extension of the fuselage in the case of Fenestron or Notar tails).
Design Helicopter	A composite helicopter used in design of the helideck having the largest set dimensions and the maximum take-off weight/mass (MTOW/MTOM) of the range of helicopters for which the helideck is designed. **Note:** The maximum design weight (mass) of the helideck may limit the usable weight (mass) of a helicopter, (See Design Load section 5.2 and Weight (Mass)/Size Limitation Markings section 6.5).
Deck integrated firefighting system(s) (DIFFS)	A fire suppression system using foam/water nozzles integrated into the helideck surface structure.
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.

Term	Definition
Fuel Filtration	Types of fuel filters: - **Filter Water Separator:** A two stage device with a filter medium that allows fuel to pass through, but traps water on its surface. As more water droplets are removed they coalesce to form larger droplets until they are large enough for gravity to transport them to a settling chamber. - **Fuel Monitor:** Single stage filtration unit designed to absorb any water present in the fuel and to cut off the flow of fuel once a certain amount of water has been exceeded. - **Combined Three-Stage Filter Unit:** A single filtration unit that embeds 3 different filtration stages. The first stage removes particulates and coalesces the water contaminant while the second stage separates water droplets from the fuel. The third stage is an extra safeguard to absorb any remaining water.
Fuel Tanks	Types of fuel tanks: - **Fixed Fuel Storage Tank:** A fixed tank used for the bulk storage of fuel until needed for dispensing. - **Portable Fuel Storage Tank:** A fuel tank used to both transport fuel and serve as a storage tank until the fuel is dispensed. - **Transit Fuel Tank:** A fuel tank used only for the transport of fuel and to replenish fixed fuel storage tanks. - **Fuel Sample Reclamation Tank:** A fuel tank used to allow fuel samples to be reclaimed and laced back into the fuel storage tank.
Ground Effect	An improvement in helicopter lift capability that develops whenever the helicopter flies or hovers at a height of 1 rotor diameter or less over the touchdown and liftoff (TLOF) area. It a result of the interference of the surface with the airflow pattern of the rotor system, and it is more pronounced closer to the ground resulting in increased blade efficiency while operating in ground effect. Ground effect results from the cushion of denser air built up between the surface and helicopter by the air displaced downward by the rotor.
Ground Effect Area	The solid area that provides ground effect. **Note:** This area can be provided by the touchdown or liftoff (TLOF) area or the touch down and liftoff (TLOF) area plus a safety shelf (if installed).
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	An area on a fixed or floating offshore facility designated for the landing and takeoff of helicopters, which includes, as applicable, some or all of the supporting facilities/equipment necessary for helicopter operations, such as personnel/cargo handling, parking, tiedown, fueling, maintenance, etc.
0.62D Helideck	A helideck on which the TLOF is of sufficient size to contain a circle with a diameter of 0.62D of the largest helicopter that will use the helideck.

Term	Definition
0.83D Helideck	A helideck on which the TLOF is of sufficient size to contain a circle of diameter of 0.83D of the largest helicopter that will use the helideck.
1.0D Helideck	A helideck on which the TLOF is of sufficient size to contain a circle of diameter of 1.0D of the largest helicopter that will use the helideck.
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.
Hostile Environment	A helicopter operating environment in which: a successful emergency landing cannot be assured, or the occupants of the aircraft cannot be adequately protected from the elements, or search and rescue response/capability cannot be provided consistent with the anticipated exposure.
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	A maintenance activity that is predominantly visual in nature, in which the condition of items are compared to a known standard.
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).
Legacy Helideck	Any helideck, designed, constructed, or installed prior to the initial issuance of HSAC RP 161 in the year 2016.
Limited Obstacle Sector (LOS)	An area on the structure side of the helideck in which obstacles may be permitted within this 150 degree or less sector, provided the height of the obstacles above the level of the TLOF is limited and within a prescribed LOS profile.
Long-Term Operation	An aviation operation that is planned for a period of continuous operation exceeding one year in duration.
Maintenance	Maintenance is considered to be all the activities required or undertaken to conserve as closely, and as long, as possible the original condition of a helideck while compensating for normal wear and tear.
Manned Facility	An offshore facility that is normally manned.
Minimum Structure	A structure with one or more of the following attributes: - Structural framing which provides less reserve strength and redundancy than a typical well braced, three-leg template type facility; - Free-standing and guyed caisson facilities which consist of one large tubular member supporting one or more wells; - Well conductor(s) or free-standing caisson(s), which are utilized as structural and/or axial foundation elements by means of attachment using welded, non-welded, or nonconventional welded connections;

Term	Definition
	- Threaded, pinned, or clamped connections to foundation elements (piles or pile sleeves); - Braced caissons and other structures where a single element structural system is a major component of the facility, such as a deck supported by a single deck leg or caisson.
Modification	Improvements or modifications to the original helideck aimed at improving safety and aligning with newer standards or guidelines.
Manual/Matrix Of Permitted Operations (MOPO)	A comprehensive risk management tool to provide standardized and consistent direction and guidance for onshore and offshore operations personnel. This tool can be applied when faced with conditions or conflicts in activities or operations that could threaten safe operations.
Normally Unattended Installation (NUI)	An offshore facility that is normally unmanned
Non-Hostile Environment	An helicopter operating environment in which : a successful emergency landing can be reasonably assured, and, the occupants of the aircraft can be adequately protected from the elements, and search and rescue response/capability can be provided consistent with the anticipated exposure.
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.
Obstacle-Free Dropdown Sector (OFDS)	An obstacle clear area provided below the helideck (TLOF) surface measured from the outer edge of the safety shelf or perimeter netting located around the landing area down to water level for an arc of not less than 180° that passes through the center of the landing "H" and outwards to a distance that will allow for safe clearance from obstacles below the helideck in the event of an engine failure for the type of helicopter the helideck is intended to serve.
Obstacle-Free Sector (OFS)	An area free of all obstacles above helideck level, usually a 210 degrees sector, outwards to a distance that will allow for an unobstructed arrival and departure path to/from the helideck for the helicopter(s) it is intended to serve.
Obstacle Sector (OS)	An area on the structure side of the helideck in which obstacles within a 180 degree sector may be permitted.
Parking Area (PA)	An area, designed to accommodate a parked helicopter, separated from the TLOF by a parking transition area (PTA).
Pitch, Roll and Heave (PRH)	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 PRH 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.

Term	Definition
	- **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.
Preventive Maintenance	Maintenance, where equipment or facilities are inspected, maintained and protected before, and to prevent, break down or occurrence of other problems. Preventive maintenance is maintenance performed with the intent of avoiding failures, safety violations, and to conserve original materials used in fabrication.
Recovery Measures	Once a hazard has been released (see Controls definition), the impact of the release of a hazard can be minimized or the recovery from the release can be improved by a series of mitigations, known as Recovery Measures.
Return Period	The average period between occurrences of an event or of a particular value being exceeded.
Rotor Diameter (RD)	The diameter of a circle made by the rotor blades while rotating.
Supplemental Aviation Weather Reporting Station (SAWRS).	SAWS: A Supplementary Aviation Weather Reporting Station at which a manual observation is the primary source of reporting the weather observation. SAWS II: A Supplementary Aviation Weather Reporting Station at which a commissioned AWAO is the primary source of reporting the weather observation and the weather observer will provide manual backup
Safety Critical Element (SCE)	A Safety Critical Element: a) means any part of facility (including a computer program) 1) that has the purpose of preventing, or limiting the effect of, a major accident; or 2) the failure of which could cause or contribute substantially to a major accident; and b) without limiting the generality of paragraph (a), includes plant installed at the installation for the purpose of 1) detecting smoke, fire, accumulations of flammable (and other hazardous) gases, leakages of flammable liquids, and other events that may require an emergency response; or 2) giving warning of an emergency by audible and, where necessary, visual alarm systems; or 3) limiting the extent of an emergency, including measures to combat fire and explosions, emergency shut-down systems and facilities for the monitoring and control of the emergency and for organizing evacuation; or

<table>
<tr><th>Term</th><th>Definition</th></tr>
<tr><td></td><td>4) protecting petroleum workers from explosion, fire, heat, smoke, hazardous gas, or fumes during any period while petroleum workers may need to remain on an installation during an emergency; or
5) safely evacuating all petroleum workers to a place of safety; or
6) providing safe means of escape in the event that arrangements for evacuation fail.</td></tr>
<tr><td>Safety Critical Task (SCT)</td><td>Task performed on a safety critical element which, if performed incorrectly due to lack of technical skills or knowledge or due to behavioral attributes, can lead to a major hazard.</td></tr>
<tr><td>Safety Net</td><td>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.</td></tr>
<tr><td>Safety Shelf</td><td>A solid surface capable of providing ground effect around the perimeter of the TLOF and to provide fall protection for personnel.</td></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>System International Units (SI)</td><td>SI units are a system of physical units based on the meter, kilogram, second, ampere, kelvin, candela, and mole, together with a set of prefixes to indicate multiplication or division by a power of ten.</td></tr>
<tr><td>Temporary Helideck</td><td>A helideck which is not part of the permanent structural design configuration of the facility that is used as a designated landing area for the embarking and disembarking of passengers and cargo in support of non-typical routine operations on the facility (such as construction and drilling activities) for a limited duration (typically less than one year).</td></tr>
</table>

Term	Definition
Touchdown and Liftoff Area (TLOF)	The load bearing area of the helideck on which a helicopter may touchdown or liftoff. **Note:** The minimum size of a TLOF is 0.83*D*. 0.83*D* is approx.. 1x Rotor Diameter (RD).
Touchdown/Positioning Marking (TDPM)	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.

Table 2: Terms and Definitions

4.2 Abbreviations

Abbrev.	Description	Abbrev.	Description
API	American Petroleum Institute	**LOS**	Limited Obstacle Sector
ARA	Airborne Radar Approach	**MMMF**	Man-Made Mineral Fibre
AWOS	Automated Weather Observation System	**MMS**	Measure of Motion Severity
BOSIET	Basic Offshore Safety Induction and Emergency Training	**MODU**	Mobile Offshore Drilling Unit
BS	British Standard	**MOPO**	Manual/Matrix Of Permitted Operations
CA-EBS	Compressed Air Emergency Breathing System	**MSI**	Motion Severity Index
CCR	Central Control Room	**MTOM**	Maximum Take Off Mass (Weight)
cd	Candela	**NFPA**	National Fire Protection Agency
DOT	Department of Transportation	**NOTAM**	Notice to Airmen
DIFFS	Deck Integrated Firefighting System	**NUI**	Normally Unmanned Installation
DSV	Diving Support Vessel	**OFS**	Obstacle-Free Sector
EBS	Emergency Breathing System	**OFDS**	Obstacle-Free Dropdown Sector
ERP	Emergency Response Plan	**OIM**	Offshore Installation Manager
FATO	Final Approach And Take-Off Area	**OPITO**	Offshore Petroleum Industry Training Organization
FG	Fire Guard	**OS**	Obstacle Sector
FMS	Fixed Monitor System	**PA**	Parking Area
FOET	Further Offshore Emergency Training	**PCF**	Post-Crash Fire
FPSO	Floating Production Storage and Offloading facility	**POB**	Personnel on Board
FR	Flame Resistant	**PPM**	Parts per Million
H_2S	Hydrogen Sulfide	**PRV**	Pressure Relief Valve

Abbrev.	Description	Abbrev.	Description
HAZMAT /DG	Hazardous Materials/Dangerous Goods	**PRH**	Pitch, roll and heave
HCA	Helideck Certification Agency	**QC**	Quality Control
HDA	Helideck Assistant	**RD**	Rotor Diameter Of The Main Rotor
HIP	Helideck Information Plate	**RMS**	Ring Main System
HLO	Helicopter Landing Officer	**RWD**	Relative Wind Direction
HOGA	Helideck Offshore GPS Approach	**SAWS**	Supplemental Aviation Weather Reporting Station
HOM	Helideck Operations Manual	**SCBE**	Self-Contained Breathing Equipment
HMS	Helideck Monitoring or Motion System	**SCE**	Safety Critical Element
HA	Heave Amplitude	**SCT**	Safety Critical Task
HERTL	Helideck Emergency Response Team Leader	**SDS**	Safety Data Sheet
HERTM	Helideck Emergency Response Team Member	**SHR**	Significant Heave Rate
HR	Heave Rate	**SI**	System International (physical units of measurement)
HRR	Helicopter Rapid Refueling	**TBOSIET**	Tropical Basic Offshore Safety Induction and Emergency Training
HUET	Helicopter Underwater Escape Training	**TDPM**	Touchdown/Positioning Marking
HMS	Helideck Monitoring System	**TFOET**	Tropical Further Offshore Emergency Training (FOET)
HSAC	Helicopter Safety Advisory Conference	**THUET**	Tropical HUET
ICAO	International Civil Aviation Organization	**TLOF**	Touchdown And Lift-Off Area
ID	Identification	**TLP**	Tension Leg Facility
IFR	Instrument Flight Rule	**UL**	Underwriters Laboratory
INC	Helideck Inclination	**UPS**	Uninterruptible Power Supply
ICS	International Chamber of Shipping	**UV**	Ultra Violet

Abbrev.	Description	Abbrev.	Description
IG	Inert Gas	**VFR**	Visual Flight Rules
IR	Infrared	**WMO**	World Meteorological Organization
LED	Light Emitting Diode	**WSI**	Wind Severity Index

Table 3: Abbreviations

5 HELIDECK AND FUEL SYSTEM RESPONSIBILITIES

5.1 Regulatory Oversight

Around the world, various documents are used to design, maintain and manage helidecks. The International Civil Aviation Organization (ICAO) has published two documents related to helideck design: Annex 14 Volume II – Heliports and a Heliport Manual - Section "Helidecks (Draft)". Most of the countries are signatories of ICAO and some countries have chosen to issue their own guidance (such as Norway, Canada, and Australia) or use guidance published by others (such as UK Civil Aviation Publication CAP 437); others have chosen to follow ICAO, and a few national regulatory authorities have chosen to allow the oil and gas industry to manage helidecks without national regulatory requirements (US FAA). As a result, global and regional standardization is difficult and when looking to a particular country one must sort out the applicable guidance regarding regulatory oversight.

Additionally, some countries such as the UK highly regulate helidecks and mandate certification of the helidecks on a regular basis. Some have no regulatory oversight at all. As a result, industry organizations such as HSAC and the International Oil and Gas Producers (IOGP) have issued guidance in the form of Recommended Practices and Checklists to assist with helideck oversight. (See Section 1 above for additional guidance.)

5.2 Helideck Responsibilities

The following prescribes the processes that should be in place in regard to responsibilities to ensure safe helideck operations and alignment with industry guidance or this RP.

5.2.1 Helideck Owners

Helideck owners shall establish operational procedures in the form of a Helideck Operations Manual (see 0), and provide sufficient personnel (see Helideck Management Section 9) to safely conduct helicopter operations and to respond in the event of a helicopter accident or incident (see Section 8.19).

HSAC RP 162 offers detailed guidance on facility modifications, which shall be followed when considering any modification of the facility that could affect the helideck or helideck operations.

> **Note**: Before approving modification of helidecks or installation of new equipment in the vicinity of helidecks, review HSAC RP Numbers: 161 and 162 for applicable obstacle clearance requirements and the plans with the helicopter operator/Aviation Advisory personnel.

- Notify (in writing) helicopter operators/bases of any new construction/equipment additions in the vicinity of the helideck and the hazard it may present. Paragraph 5.2.2 and 5.3.2 provide recommended formats for documentation of changes.
- Inspect and maintain the helideck and fuel, firefighting, weather, and lighting systems (if installed) and associated equipment according to the schedules in APPENDICES and the checklists located at the end of this RP. These requirements should be detailed in the facility maintenance manual (see 7.2.7).
- Repair any helideck discrepancies in a timely manner.
- In accordance with HSAC RP 162 sections 2 and 3 upgrade any helideck and associated system when regulatory or industry guidance dictate or when operationally the option to do so is timely.
- A Helideck Operations Manual (HOM) and Helideck Information Plate (HIP) shall be developed for each offshore facility with a helideck, see Table 4 and 7.2.2.
- Complete helideck assessments as outlined in Section 6 and provide helideck documentation as outlined in 7.2.

- Ensure the helideck and associated systems are inspected at intervals prescribed in this document in Sections 7.2.5 and 11 using the checklists located at the end of the RP. This shall be accomplished as follows:
    - Accept an existing inspection report from a helideck inspection completed by a competent helideck inspector (see section 12)
    - Complete an inspection themselves.
    - Accept an inspection completed by an approved third party helideck inspection organization

5.2.2 Helicopter Operator

Prior to using a helideck the helicopter operator shall ensure the helideck and associated systems have been inspected at intervals prescribed in this document in Sections 10 and 11 using the checklists located at the end of this RP. This shall be accomplished as follows:

- Accept an existing inspection completed by the facility owner or oil company using a competent helideck inspector (see section 12).
- Complete an inspection themselves.
- Accept an inspection completed by an acceptable third party helideck inspection organization
- Provide training to pilots on helideck design/markings, associated systems, and helideck management.
- Ensure pilots report any discrepancies that could impact safe operations and pass those discrepancies to the facility owner.

Note 1: For infrequent use and where the above has not been completed, a desktop assessment must be conducted prior to flight and the visual overflight assessment of the landing environment. A desktop assessment should include the review and assessment of the following documents:

- Helideck drawings (if available)

- Foam Test Certificate (for locations equipped)

- Recent helideck photos

- Last helideck inspection report

- Helideck Information Plate (HIP)

Note 2: The method above should not be used for an extended exposure (maximum 5 landings or maximum duration of 14 days, whichever threshold is reached first) or repeated more than twice/year for the same location(s). The visual overflight and the desktop assessment do not replace the actual helideck inspection, but merely reduces risk for a limited number of landings on the helideck (limited exposure).

Note 3: Use an operator NOTAM (Notice to Airmen) information sharing system to advise all operator aircrew of the discrepancies and/or request the facility owner update the Helideck Information Plate (HIP) (HSAC RP 164), and keep the notifications active until the discrepancies are resolved.

Note 4: Ensure competent personnel perform helideck inspections (see Section 12) and Quality Control (QC) checks/inspections of refueling operations.

5.3 Fuel Systems and Refueling

5.3.1 Fuel System Owners

Ensure a written QC system is provided for the fuel system, covering the minimal requirements in this RP and applicable references/regulations. Included should be necessary forms/checklists used in the routine system checks.

Before approving installation of new fuel systems, review the applicable specifications in the list of references at the front of this document and review the plans with the helicopter operator and Aviation Advisory personnel.

Coordinate required inspections of the fuel system per 5.3.1 below and ensure defects are remedied and hazards reported to helicopter operators per 5.2.2 Note 2.

Ensure that the fuel system as outlined in 10.7 is inspected with checklists located at the end of this RP on a daily, monthly, six-monthly, and annually basis, and maintained as per APPENDIX 4 (Attachment 2 – Fuel System Maintenance Requirements) using properly qualified personnel (see 12.5) to perform QC checks and refueling operations.

5.3.2 Pilots and Helicopter Operators

Hazard/Non-Conformity reports are submitted to the fuel system/facility owner for any fuel system defects. Refer to note 5.2.2 Note 2 for additional details.

Verify that the daily QC checks have been completed before fuel is used. For additional details refer to the HSAC "Aircraft Refueling Checklist" and the Fuel System Daily Inspection Checklist located at the end of this RP.

Ensure that an annual inspection (see 10.7.7) is completed by one of the following means:

a) Accept an existing inspection completed by a competent inspector employed by the facility owner.
b) Complete an inspection themselves.
c) Accept an inspection completed by an acceptable third party fuel system inspector.

Note: Use an operator NOTAM (Notice to Airmen) information sharing system to advise all operator aircrew of the discrepancies and keep the notifications active until the discrepancies are resolved or alternatively the helicopter operator may use another documented means to accomplish this notification so long as it accomplishes the objective.

6 HELIDECK ASSESSMENTS

6.1 Five-Year Structural Assessment

As outlined in RP 162 Section 3, helidecks should periodically, on a minimum of a five-year basis, be assessed for structural integrity/damage by an engineer for it to be in conformance with the facility owner plan.

6.2 Incident/Damage Assessment

A structural assessment should be completed by an engineer following an incident or damage, such as a fire or helicopter emergency/crash landing that may affect the structural integrity of a helideck or its supporting structure. See RP 162, Section 3.

6.3 Risk Assessments

An initial and five-year risk assessment of the helideck and its associated systems should be completed for all facilities, inclusive of a dedicated Risk Assessment (RA) for firefighting systems (see Section 13.9.4). This RA should also include an assessment of the emergency response preparedness, per 13.1.

Legacy and temporary helidecks should follow the requirements included in RP 162 and new helidecks should follow RP 161. Where conditions are at variance with the requirements in RP 162, a risk assessment (RA), should be completed by the facility owner with input from the helicopter operator, as defined in API 2SIM for structural aspects and Annex A of RP 162 for helideck operational and design aspects.

Note 1: Helidecks designed, constructed, and installed after the initial release date of HSAC RP 2016-1 (May 2016), renamed to HSAC RP 161 in December 2019, should be assessed against the design criteria set forth in that document.

Note 2: Other regulations may affect helideck operations (i.e. lighting, release of combustible gases, aviation fuel systems, etc.). It is the responsibility of the facility owner to determine which rules/regulations/guidance are applicable and should be followed, depending upon the location, type of facility and type of operations to be conducted.

7 HELIDECK OPERATIONS

7.1 General

This section serves as a guide for the operation of offshore helidecks.

Helicopter operations are integral to both routine and emergency operations of the facility. The management/operation of the helideck should be included in the overall plans for management of the facility.

In planning for the operation of the helideck, consideration should be given to the following:

a) Type(s), sizes and operating weight of helicopter(s) that will be used
b) Frequency and scale of operations (numbers of passenger movements)
c) Training of personnel
d) Facility operations (e.g. perforating operations)
e) Access and egress
f) Night or instrument operations (if required)
g) Communications requirements
h) Fuel requirements
i) Personnel safety equipment
j) Cargo Management
k) Security

l) Weather
m) Passenger management
n) Emergency procedures
o) Firefighting

7.2 Documentation

The following controlled documents shall be available on the facility:

Required Helideck Documentation		
#	**Ref**	**Document Name**
1	7.2.1	Helideck Operations Manual (HOM)
2	7.2.2	Helideck Information Plate (HIP)
-	7.2.3.1	Risk Assessments
3	7.2.3.1.a)	Initial and five-yearly for the helideck and associated systems, see 6.3
4	7.2.3.1.b)	Variances from RP 162 for legacy helidecks, as necessary, see 6.3
5	7.2.3.1.c)	Firefighting, five-yearly, see 13.9.4
6	7.2.3.1.d)	Emergency Response, initial see 13.1
-	7.2.3.2	Structural Assessments
6	7.2.3.2.a)	Structural integrity completed every 5 years, see 6.1. above
7	7.2.3.2.b)	Incident of damages, as events occur see 6.2 above
8	7.2.4	Manual/Matrix of Permitted Operations (MOPO)
9	7.2.5	Helideck Inspections
10	7.2.6	Helideck Historical Documents
11	7.2.7	Facility Maintenance Manual
12	7.2.8	Helideck Daily Status Form Report

Table 4: Required Helideck Documentation

7.2.1 Helideck Operations Manual (HOM)

HOM shall be developed by the facility owner to provide guidance on the overall helideck operation and management of that specific facility.

Note: In some locations, a Helicopter Landing Officer Manual may meet the requirements for an HOM as listed in this RP.

The HOM which will also be provided to the helicopter operator(s), shall contain the following, as a minimum:

a) Helideck Operations
    1) Helideck Team Checklists: Prior to helo arrival, helo stay and departure, helo start-up and shut-down.
    2) Clear deck policy.
    3) Procedures for arriving, departing, turnaround of helicopters.

4) Crane Operations procedures and policy.
5) Obstructed helideck procedures.
6) Winching Operations (if needed).
7) External load operations (if needed).
8) Closed helideck procedures.
9) Blocked helideck procedures.
10) Dangerous Goods handling.
11) Fuel operations.

b) Helideck Management
1) Designated helideck and emergency response personnel responsibilities.
2) Passenger management, helideck access, security, and manifesting procedures.
3) Cargo handling procedures.
4) Refueling system maintenance and helo fueling procedures (if installed).
c) Helideck and associated system (see definitions) maintenance and inspection requirements.
5) Training of personnel.

c) Helideck Equipment Availability
1) Routine
2) Emergency

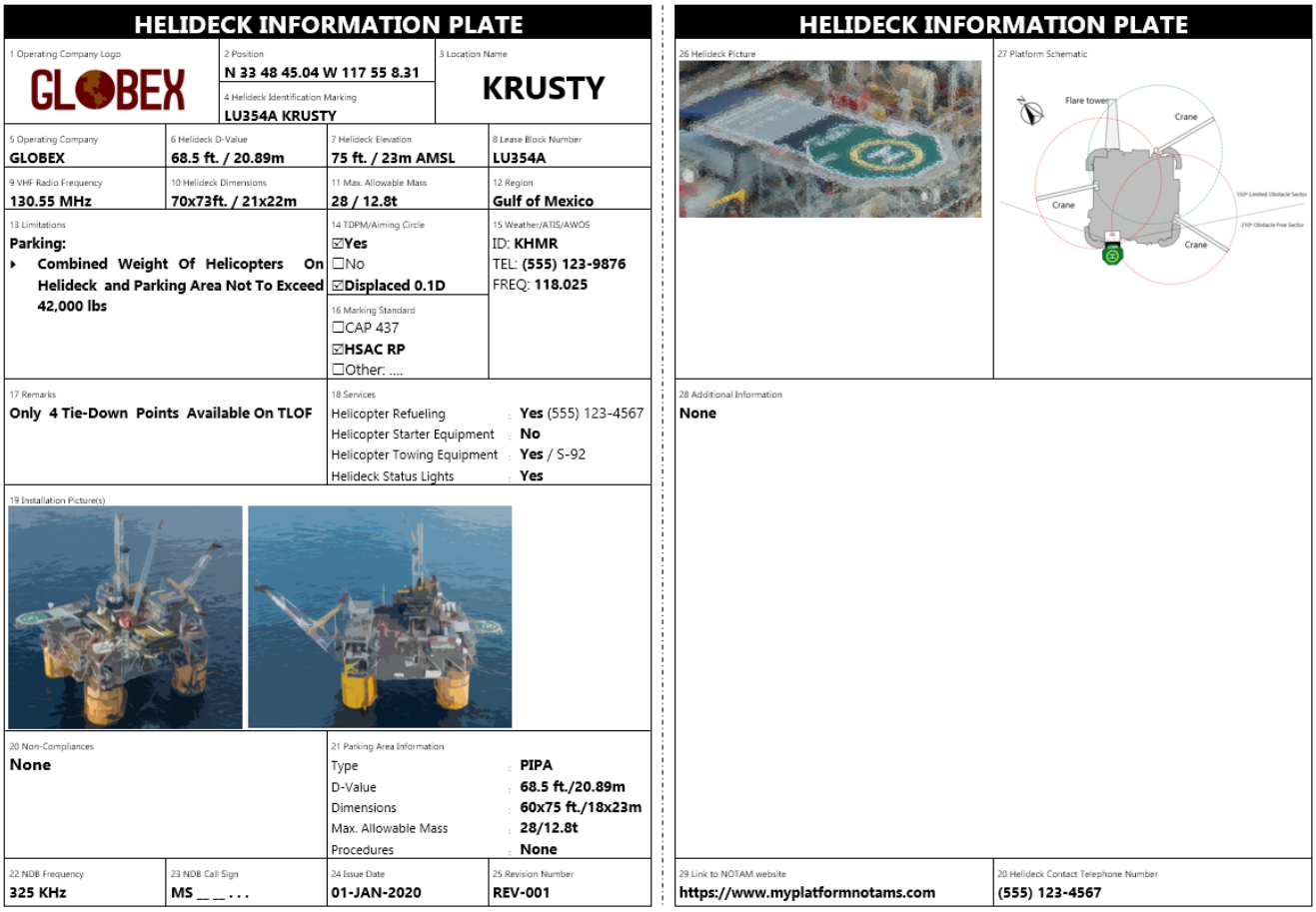
d) Helideck Communications
1) Weather reporting and adverse weather limitations reporting procedures.
2) Checklists: Prior to helo arrival, helo arrival, helo stay and departure, helo start-up and shut-down.
3) Hand signals
4) Routine and emergency

e) Emergency Response Planning (ERP)
1) Training and scenario drills/exercises plan.
2) Helideck Firefighting procedures.
3) Emergency Response Plan.

7.2.2 Helideck Information Plate (HIP)

The facility owner shall develop a HIP (sample shown below) per HSAC RP 164 for each facility with a helideck and make these HIPs available to the helicopter operator(s).

The HIP should include as a minimum the following for each helideck: overhead and side views (pictures acceptable) of the helideck, size/weight capability, markings, lighting (if installed), communications, weather capabilities, obstacles, turbulence issues, hazards, fuel (if installed), and any specific operational procedures/limitations. See sample below.



HELIDECK INFORMATION PLATE

1 Operating Company Logo: GLOBEX	2 Position: N 33 48 45.04 W 117 55 8.31 4 Helideck Identification Marking: LU354A KRUSTY	3 Location Name: KRUSTY	
5 Operating Company: GLOBEX	6 Helideck D-Value: 68.5 ft. / 20.89m	7 Helideck Elevation: 75 ft. / 23m AMSL	8 Lease Block Number: LU354A
9 VHF Radio Frequency: 130.55 MHz	10 Helideck Dimensions: 70x73ft. / 21x22m	11 Max. Allowable Mass: 28 / 12.8t	12 Region: Gulf of Mexico
13 Limitations: **Parking:** ▸ Combined Weight Of Helicopters On Helideck and Parking Area Not To Exceed 42,000 lbs		14 TDPM/Aiming Circle: ☑Yes ☐No ☑Displaced 0.1D 16 Marking Standard: ☐CAP 437 ☑HSAC RP ☐Other:	15 Weather/ATIS/AWOS: ID: KHMR TEL: (555) 123-9876 FREQ: 118.025
17 Remarks: Only 4 Tie-Down Points Available On TLOF		18 Services: Helicopter Refueling : Yes (555) 123-4567; Helicopter Starter Equipment : No; Helicopter Towing Equipment : Yes / S-92; Helideck Status Lights : Yes	
19 Installation Picture(s)			
20 Non-Compliances: None		21 Parking Area Information: Type : PIPA; D-Value : 68.5 ft./20.89m; Dimensions : 60x75 ft./18x23m; Max. Allowable Mass : 28/12.8t; Procedures : None	
22 NDB Frequency: 325 KHz	23 NDB Call Sign: MS _ _ . . .	24 Issue Date: 01-JAN-2020	25 Revision Number: REV-001

HELIDECK INFORMATION PLATE

26 Helideck Picture	27 Platform Schematic: Flare tower, Crane, Crane, Crane
28 Additional Information: None	
29 Link to NOTAM website: https://www.myplatformnotams.com	20 Helideck Contact Telephone Number: (555) 123-4567

Figure 1: Example HIP

7.2.3 Assessments

7.2.3.1 Risk Assessments:

a) Initial and five-yearly for the helideck and associated systems, see 6.3
b) Variances from RP 162 for legacy helidecks, as necessary, see 6.3
c) Firefighting, five-yearly, see 13.9.4
d) Emergency Response, initial, see 13.1

7.2.3.2 Structural Assessments:

a) Structural integrity completed every 5 years, see 6.1 above.
b) Incident of damages, as events occur see 6.2 above

7.2.4 Manual/Matrix of Permitted Operations (MOPO).

A MOPO should be developed and implemented by the facility owner as a comprehensive risk management tool to provide standardized and consistent direction and guidance for their onshore and offshore operations personnel. This tool can be applied when faced with conditions or conflicts in activities or operations that could threaten safe operations. The Manual of Permitted Operations (MOPO) includes a set of matrix charts that uses a "traffic-light" coded approach to indicate when activities can either proceed unrestricted, can proceed with caution,

or are prohibited. These activities and operations include wells, production, construction, maintenance and transportation (including helicopter operations and helicopter refueling operations).

If a Manual is not available, a single Matrix of Permitted Operations should be implemented for helicopter operations and helicopter refueling operations (see APPENDIX 2 – Sample MOPO Matrix for an example). The MOPO covers concurrent operations, external influences and impaired Safety Critical Elements (see 10.6.3). Guidance is provided for each environmental situation to assist the user with understanding the threats associated with specific activities, and what additional controls may need to be implemented to proceed with caution. Users include maintenance planners, project engineers, supervisors, technicians, operators, and line management.

The tool is routinely used during work planning, work approval process, and during work execution when conditions change, and does not add significantly to the time for completing those activities. The MOPO is constructed from existing documents and processes including the HSE Case, bow-ties, maintenance procedures, operating procedures, HSE standards and regulations. Teams consisting of experienced senior technical and operations personnel are engaged to conduct validation of the matrices and provide guidance for incorporation in the tool. (See APPENDIX 2 – Sample MOPO Matrix.)

7.2.5 Helideck Inspections

Copies of the ALL helideck and fuel system (if installed), inspection reports (Section 10.2 and 10.7) and documentation of discrepancy correction shall be available on the facility.

7.2.6 Helideck Historical Documents

Copies of original helideck design documents, significant modifications, and certification/re-certification shall be retained.

7.2.7 Facility Maintenance Manual

Each facility shall have a Facility Maintenance Manual which shall include the maintenance requirements for the helideck and is associated systems, see 10.3.1 and 10.6.1.

7.2.8 Helideck Daily Status Report

Accurate weather information at the offshore destination and the status of helideck support systems (fuel, communications, helideck hazards, etc.) are required by pilots and operations personnel for flight planning purposes. The operators and facility owners should use a Helideck Daily Status Report, similar to the sample attached at APPENDIX 3 Attachment 6 – Helideck Daily Status Report, to relay the required current information. This report should also provide information on the specific helicopter operator's adverse weather limits to enable offshore personnel, pilots and operations personnel to be fully aware when specific limits are being reached without researching the information in an operator’s Operations Manual, etc.

7.3 Helideck Environment

See HSAC RP 161 and 162 and other regulatory agency requirements for details on design criteria for the helideck environmental area. See Figure 4 for an illustration of the helideck environment and the environmental topics considered essential when evaluating or planning helideck operations.

7.3.1 Surface

The helideck surface shall have specific surface friction characteristics (see APPENDIX 3, Attachment 1 – Helideck and Associated System Maintenance Requirements item 1.5 for friction requirements). All materials, covering, or coatings used to provide a nonskid surface shall be structurally fastened to the helideck or bonded with an adhesive agent that is not chemically altered in the presence of jet fuel and oil contamination spills. The surface must be kept clean of guano (see 7.3.8) and other contamination that can affect non-skid properties of the surface or visual qualities of the markings.

7.3.2 Helideck Landing Nets

> **Note:** Where skid-fitted helicopters and/or a deck integrated fire-fighting system (DIFFS) are in use on a solid plate helideck, landing nets are not recommended and shall not be fitted.

Landing nets may be used for floating facilities that may be subject to significant pitch, roll, and heave movements and when installed shall not cover the markings outside the TDPM. Landing nets are not required on fixed installations that have no movement and which are not subject to ice or snow.

When friction coefficients do not meet minimal requirements outlined in this document, landing nets shall be used.

The grid size, area, and number of securing points shall be determined with due consideration given to the largest helicopter the helideck is designed to accommodate.

The material shall be 0.8 in. (20 mm) diameter sisal or authority-approved alternative nets (FricTape, Helimesh, etc) meeting the specifications of UK CAP 437, with a maximum mesh size of 8 in. (200 mm). The intersections shall be knotted.

> **Note:** Polypropylene shall not be used.

The net shall be tensioned so that it shall not be possible to raise any part of the net by more than approximately 10 in. (250 mm) above the helideck surface when applying a vigorous vertical pull by hand.

The net shall be secured every 5 ft. (1.5 m) around the landing area perimeter and tensioned to at least 2225N.

7.3.3 Perimeter Safety Area & Safety Net/Shelf

A flame retardant, ultra violet (UV) resistant safety net/shelf to provide fall protection for personnel must be installed around the helideck as prescribed in HSAC HSAC RP Nbrs: 161 and 162 and capable of supporting 300 lbs. (136kg) at any point, unless safety is ensured by another form of construction around the helideck.

Safety shelves will have these design features in addition to those required for a safety net:

a) Painted or constructed of materials in contrasting color to the helideck surface, normally yellow.
b) Constructed of corrugated materials and may be covered with chain link fencing, if desired.
c) Include an outer grab rail painted red.

> **Note 1:** If the TLOF is less than 1.0D a solid safety shelf shall be provided.
>
> **Note 2:** The height of the safety net/shelf shall not exceed the height of the helideck (TLOF) surface.
>
> **Note 3:** A solid safety shelf instead of a safety net can reduce the turbulence problems from adjacent structures located near helidecks and will serve to disperse the burble effect of the wind and in addition to provide an increased ground effect area. Additionally, the maintenance requirements are significantly less for a safety shelf as periodic drop testing of panels is not required as it is for perimeter safety nets. Safety shelves should be painted in colors contrasting to the TLOF surface (preferably gray).

7.3.4 Helicopter Operations in the Final Approach and Take Off (FATO) Area

The helideck shall have takeoff and approach paths selected to provide the most advantageous line of flight to and from the helideck. The area around the helideck is divided into sectors for the purpose of determining obstruction clearance requirements. There is an obstacle free sector (OFS) of 210 degrees with no obstacles other than items such as lights, fire monitors or collapsed handrails above the helideck surface level in that sector. There is also a 150 degrees limited obstacle sector (LOS) in which some obstacles within certain specifications are allowed and an obstacle free dropdown sector (OFDS) of at least 180 degrees below the TLOF. These are explained in detail in RP 161 paragraph 4.3.5 and RP 162 paragraph 3.3 and examples are illustrated below.

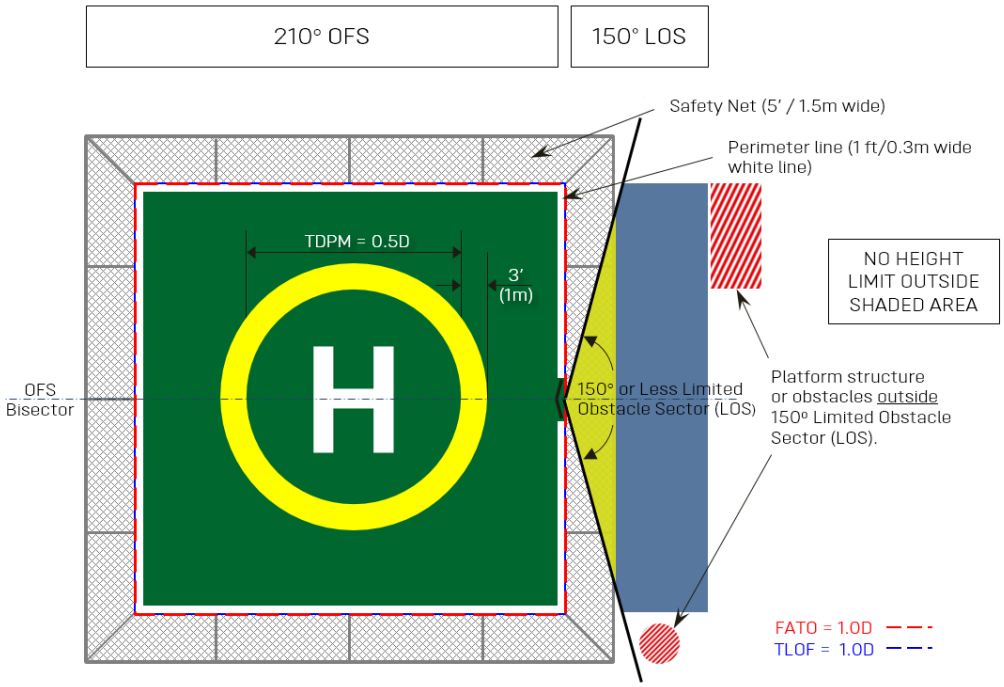


Figure 2: Illustration of OFS and LOS

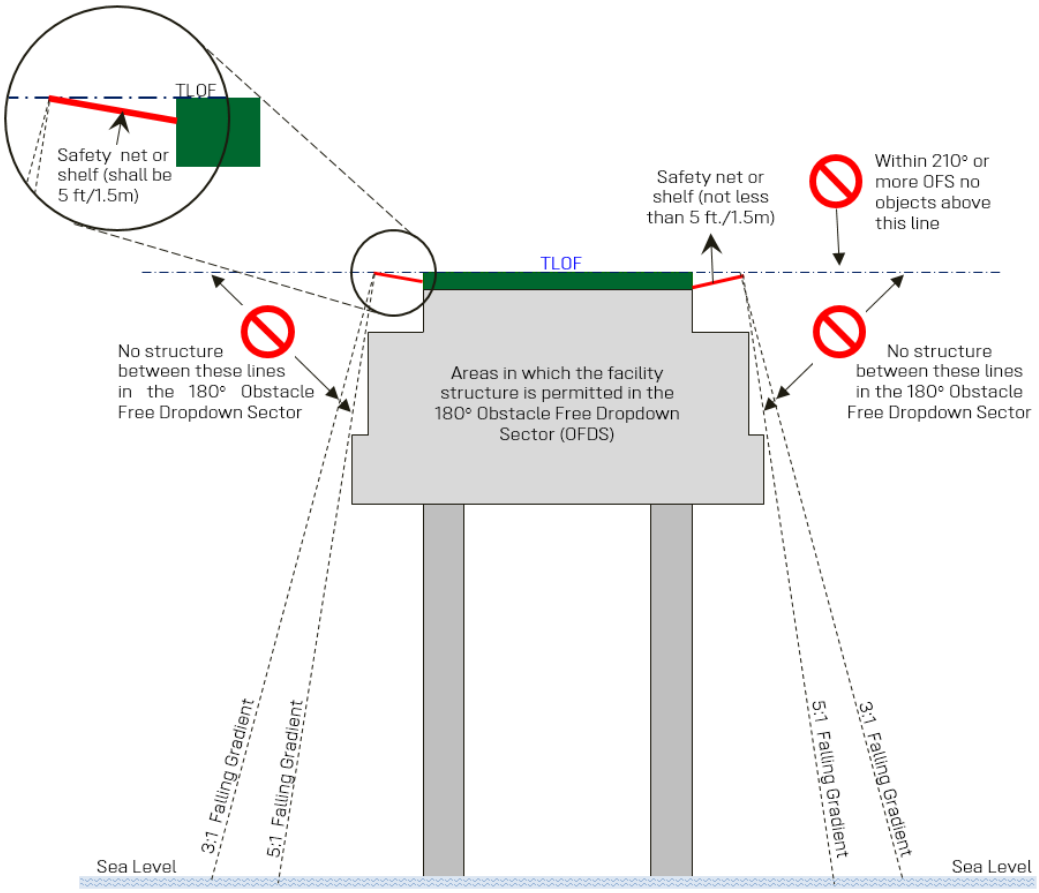


Figure 3: Illustration of OFDS

7.3.5 Obstacles

No obstacle shall be permitted to protrude through the obstacle free surfaces (OFS and OFDS, or exceed the profile depicted by the 150 degree LOS). However, if this is unavoidable for legacy helidecks, restricted operations may be conducted on limited headings or by smaller helicopters after a completed and documented risk analysis and mutual agreement between the aircraft operators and offshore facility management. The area in which obstacles are permitted in limited heights is the area illustrated in **Error! Reference source not found.** as the LOS. For some l egacy helidecks an obstacle sector (OS) is allowed on the structure side of the helideck in which obstacles within a 180 degree sector may be permitted (See HSAC RP 162), which is a variant of the LOS. Any obstacles on the landing surface that cannot be removed and could create a hazard (e.g. raised tie-down points) should be marked by a 4 inch red line as shown in HSAC RP 162 paragraph 4.9.

For operational considerations, a properly parked helicopter on a helideck with a parking area (PA) does not constitute an approach and departure obstruction as a PA should be positioned behind the 150 degree LOS where the Parking Transition Area will extend 1/3D and aligns with the 1/3D distance covered by the 150 degree LOS profile. See RPs 161 and 162 for information on PAs.

Objects above the helideck (TLOF) surface in the OFS for a helideck with a 1.0D FATO/TLOF or larger, which are required to be located outside the FATO/TLOF, such as foam monitors (where provided), lights, etc., the height shall be limited to 6 in. (15 cm). See RP 161 paragraph 5.3.5.2 for listing of allowed objects.

For a helideck with a less than 1.0D TLOF, objects which are required to be located just outside the TLOF, such as foam monitors (where provided), lights, etc., the height above the TLOF surface shall be limited to 2 in. (5 cm).

7.3.6 Hazards

7.3.6.1 Training and Identification

Helicopter Operators are encouraged to provide periodic training to pilots on the identification and reporting of helideck hazards (see 5.2.2 Note 2). Examples of helideck hazards are listed in 7.3.5.

7.3.6.2 Examples of Helideck Hazards

a) **Landing gear hazards** include anything that could snag the aircraft landing gear. This could be anything that is raised above the helideck landing surface. Examples:
   1) Raised tie-down points
   2) Deck plates with raised edges
   3) Uneven helideck surfaces
   4) Obstructions around the helideck perimeter exceeding 2 inches in height
   5) Fuel system hoses that are not properly relocated off the helideck or pipes to hold fuel system nozzles.
   6) Helideck Landing Net for skid-fitted helicopters (see 7.3.2)

b) **Tail rotor hazards** include anything above 2 inches in height. This typically would be anything outside the helideck surface perimeter such as lights, safety fence, etc.; but can include other items such as:
   1) Sections of safety fence that may be above helideck level
   2) Fire extinguishers, or fuel system containers, etc above deck level.
   3) Raised stairwell handrails (some installations have railings/handrails that can be raised/lowered).
   4) Obstructions around /outside the helideck perimeter exceeding 2 inches in height.
   5) Signage positioned near the helideck

c) **Main rotor hazards** include anything that extends through or outside the allowed obstacle gradient and sector (see 7.4.1.1). Generally, main rotor obstacles would be anything above 4 feet in height. Examples:
   1) Windsock masts
   2) Crane and flare booms
   3) Obstructions outside the helideck perimeter exceeding 4 feet in height

d) **Inadequate surface friction contact for the landing gear**. This can be caused by any of the following:
   1) Excessive bird droppings causing the helideck to be slick
   2) Inadequate grit in surface paint
   3) Worn painted surfaces

e) **Lack of an efficient windsock.** See 7.6.2.

f) **Lack of markings, non-standard markings, or obscured/faded markings** for providing adequate visual cues or hazard warning. See RP 161 and 2 for required markings.

g) **Lack of housekeeping around and below helideck.** The downdraft of the helicopter can cause loose and unattached items to be blown around due to the high wind velocity of the helicopter's downwash and the increase of the wind under and inside the helideck structure. The area will be

policed for loose or unattached items that could become airborne or disrupted with the downwash of the helicopter. A final check before providing a 'Green Deck' shall be performed by a helideck team member.

h) **Discharges of hot air, raw gas, venting, Hydrogen Sulfide (H_2S)** (see 7.3.7)

7.3.7 Approach and Departure Sector Environmental Factors

See UK CAA Paper 2008/03 "Helideck Design Considerations – Environmental Effects" provides good background information.

7.3.7.1 Helideck Orientation and Winds

The orientation of the helideck (see illustration below and RP 161 paragraph 5.3.5.6) in relation to the main structure(s) of the offshore facility and the direction of the strongest prevailing winds will be a critical factor in the ability to operate helicopters safely and efficiently in wind speeds over fifteen (15) knots, during instrument conditions, and/or at night. A Computational Fluid Dynamics Study or wind tunnel testing can provide data to determine the impact of winds, creation of turbulence and dispersion of gasses in different scenarios. (See RP 161 paragraph 5.7)

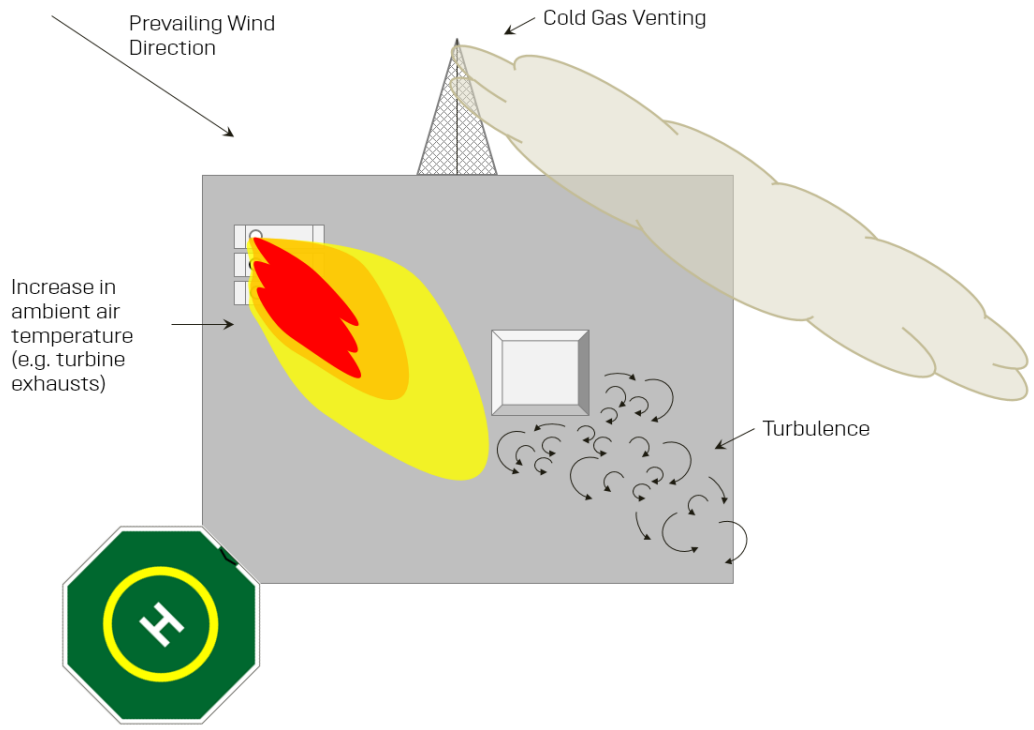


Figure 4: Illustration of Helideck Environment

7.3.7.2 Turbulence

The physical relationship of the air flow across and above the helideck, and crossing the arrival and departure flight paths is impacted by the design of the overall installation, its superstructures, and the air flow and potential hot air and gas discharges should be evaluated in the establishment of operational procedures to be used for individual helidecks. See RP 161 paragraph 5.7

7.3.7.3 Clear Area.

Obstructions below the helideck may cause turbulence above or adjacent to the helideck (see illustration below). The helideck should be located at a height above significant surrounding structures, with a clear unobstructed air gap beneath the helideck of at least 10 feet (3 m) recommended. For legacy helidecks, this may be reduced to a minimum air gap of 6 ft. (1.8 m) between the TLOF and any building roof (RP 162 Par. 3.9).

Note 1: A solid safety shelf instead of a safety net can reduce the turbulence problems from adjacent structures located near helidecks and will serve to disperse the burble effect of the wind and in addition to provide an increased ground effect area.

Note 2: Fixed installations shall be sited so that the prevailing wind over the helideck comes from open water across the helideck, not through the installation structure.

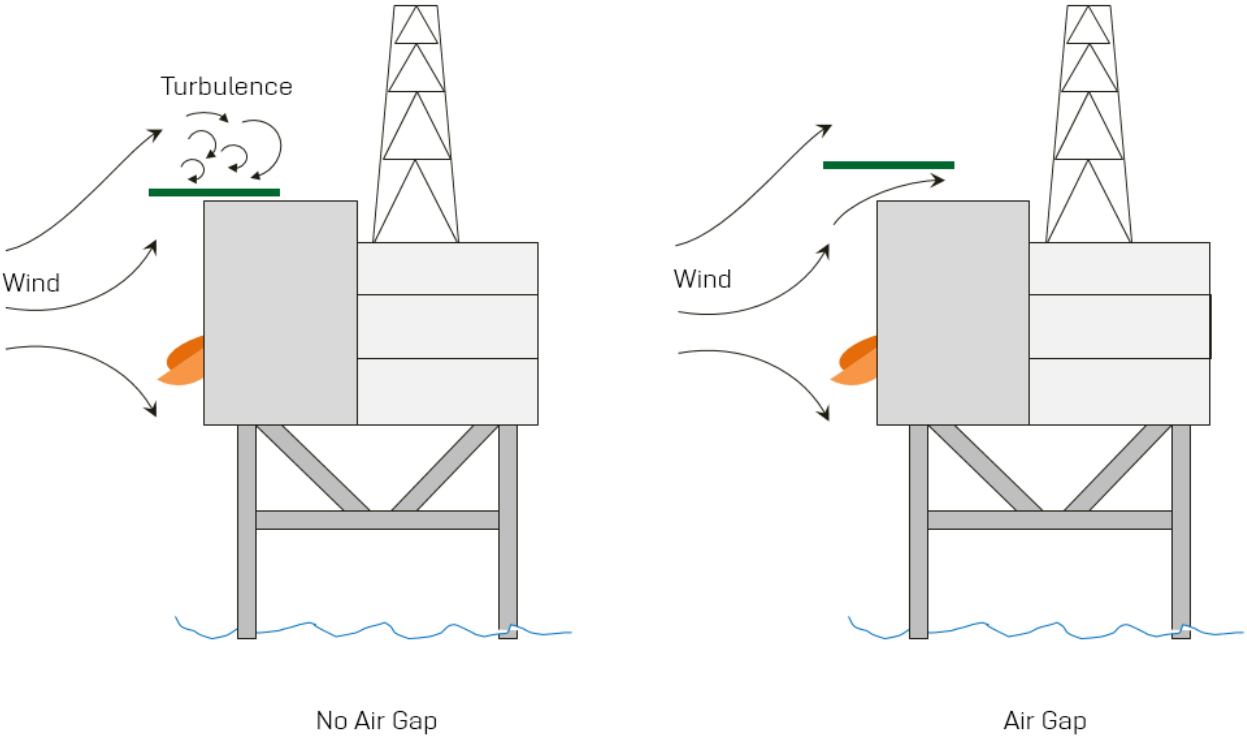


Figure 5: Turbulence with and without a Helideck Air Gap

7.3.7.4 Hot Air and Raw Gas Discharges.

a) Raw Gas: Raw gas discharges or hot air discharges from compressors and cooling systems adjacent to helidecks may be hazardous to helicopter operations and can drastically affect helicopter performance and appropriate restrictions shall be imposed on the use of the helideck where either of the above exists.
b) As a general rule, a limit for the vertical airflow velocity of 5.75 ft/s (1.75 m/s) should not be exceeded for hot air discharges. See RP 161 for additional guidance.

Conditions during which exceedance of the mentioned vertical airflow velocity are expected shall be depicted in the Helideck Information Plate or noted in an active NOTAM, in order to inform flight crew of the potential safety issue during the flight planning stages. Downloading the helicopter to a lower take-off or landing weight can positively mitigate potential turbulence issues.

7.3.7.5 Flare Towers or Gas Booms.

Flare towers or gas booms can present flight hazards both as an obstacle for hot air, raw gas, etc discharges and flying downwind or parallel should be avoided by aircrews. Helicopter operators shall have specific procedures regarding flight near flare towers in their Operation Manuals. Additionally, these towers shall be marked as obstacles and if not always lit be illuminated indirectly with spot lights, see 7.5.1.3. Additionally, the sources for each of the discharge types shall be noted on the Helideck Information Plate and shall include conditions during which discharge might pose a hazard to helideck operations. The information depicted in the Helideck Information Plate or noted in an active NOTAM, are needed to inform flight crew of these potential safety issues during the flight planning stages.

7.3.7.6 H_2S

Hydrogen sulfide (H_2S) gas discharge in higher concentrations (300 ppm to 500 ppm) can cause loss of consciousness within a few seconds. Inhalation of H_2S can be fatal, and specific procedures are required for facilities where H_2S may be present, see 8.12.

H_2S procedures shall be included in the HOM and shared with the helicopter operator(s). Flight crew flying to/from facilities that might have H_2S discharges shall be trained in H2S procedures and shall have properly fitted PPE onboard during flights to/from the facility. H_2S potential shall also be noted on HIP and/or NOTAM.

> **Note:** Gas detectors/Sniffers (generic term used to describe automated vapor detection devices) or other detection devices (infrared, etc.) may be used to detect these gas discharges and to automatically activate status lights (see 8.12) when discharges present a hazard to flight operations.

7.3.8 Bird Control

Birds in the vicinity of offshore facilities might pose safety issues for helideck operations. In addition to the probability of bird strikes, bird guano contamination may be routinely encountered, particularly at normally unattended installations (NUI), and especially at certain times of the year for facilities located in proximity to bird migratory routes.

The presence of sea birds and guano contamination on or around the TLOF should be noted and reported by flight crews on the Daily Helideck Report. Significant surface contamination may result in–flight restrictions when the build-up of guano has a detrimental effect on the interpretation of surface markings and an inability to maintain an adequate friction on the surface

Measures taken to discourage sea birds from roosting on helidecks have included visual deterrents, different audio deterrents and combined audio/visual deterrents that build-in random changes such as to the distress call. However, over a passage of time, birds have tended to habituate to any 'solutions' that involve audio and/or visual deterrents, even where these incorporate random changes. One 'solution' that has had some success is the application of pressurized water spray systems, to which birds do not appear to readily habituate (pressurized water could be delivered from an automated fire-fighting deck integrated firefighting system (DIFFS) or a firefighting ring-main system (RMS).

Another promising development in bird deterrence is the use of built-for-purpose laser systems.

Removal of severe guano contamination is required for continued use of the helideck.

> **Note:** A Control of Substances Hazardous to Health assessment shall be carried out to cover personnel exposure during cleanup and disposal operations, and that adequate PPE has been provided for the cleanup activities.

7.4 Markings

Proper markings are critical in providing accurate helideck information to the pilot and are crucial proper visual cues for approach. See RPs 161 section 6 and -2 section 4 for proper markings. Typical marking color specifications are shown in the table below.

Typical Paint Color Codes for Markings		
Color	**US [1]**	**International[2]**
Dark Green	GN-6 (Safety Green)	BS 381C: 267/RAL 6020 (Deep Chrome Green) BS 4800: 14.C.39 (Holly Green)
Yellow	YE-3 (Safety Yellow)	BS 381C: 309/RAL1018 (Canary Yellow) BS 4800: 10.E.53/RAL1023 (Sunflower Yellow)
White	WH-1 (Standard White)	RAL 9010 (Pure White) RAL 9003 (Signal White)
Red	RD-2 (International Red	BS 381C: 537/RAL 3001 (Signal Red) BS 4800: 04.E.53/RAL 2002 (Poppy)

Note 1: The US colors noted above are manufactured by PPG Ameron, equivalent colors from other manufacturers are acceptable

Note 2: BS 381C (1996) standard or the equivalent BS 4800, White conforms to RAL standards.

Note 3: When ordering the paint for use on a helideck, ensure the manufacturer provides the necessary "grit" to provide the required friction coefficient (See Appendix 3, Attachment 1 – Helideck and Associated System Maintenance Requirements, item 1.5 which prescribes the friction specifications).

Note 4: Where several installations bearing similar names are located in close proximity, each shall have a distinctive identifier name.

Table 5: Typical Paint Color Codes for Markings

Typical markings for a helideck are shown in the figure below (see RP 161 paragraph 7).

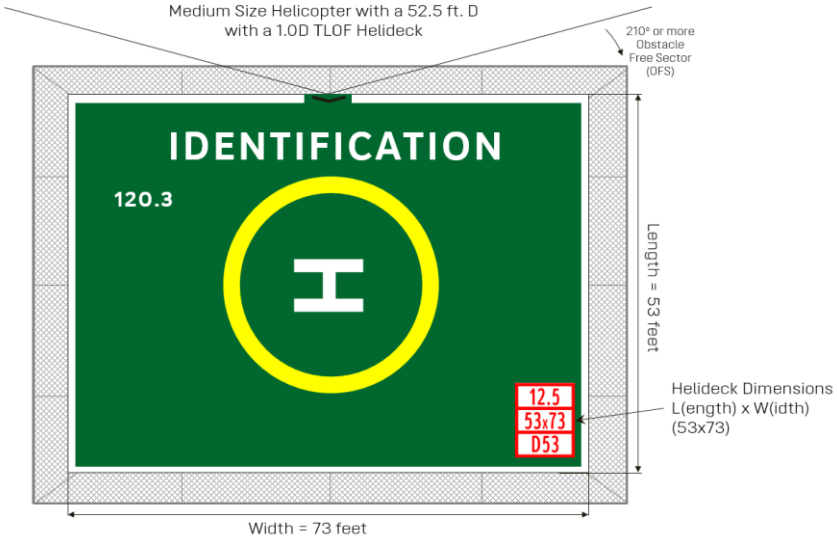


Figure 6: Typical Markings for 1.0D 52.5 ft. Medium Helicopter Rectangular Helideck

Note: Exit markings omitted in the figure above.

7.4.1 Touchdown/Positioning Marking (TDPM)

One of the most critical markings is the yellow circular touchdown/positioning marking (TDPM) which is the aiming point for a normal touchdown (landing) so located that when the pilot's seat is kept over the marking, the whole of the undercarriage will be within the TLOF and all parts of the helicopter will be clear of any obstacles by a safe margin. The TDPM also provides the same protection (clearance) when maneuvering/turning on the TLOF. The relationship of the TDPM to the LOS when a helicopter is occupying the TLOF is shown in Figure 7 for a 1.0D helideck. See HSAC RP Nbrs: 161 and 162 for more details.

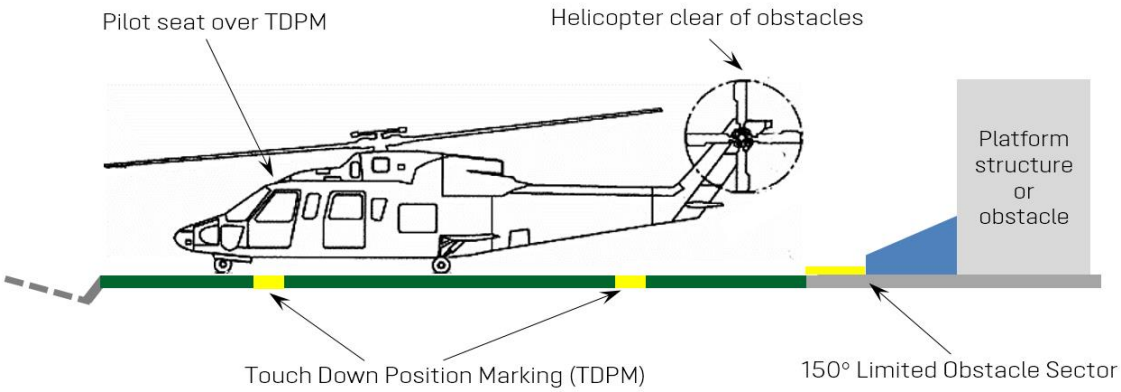


Figure 7: Relationship of the TDPM to LOS for a 1.0D TLOF

Any markings that are missing, faded, or obstructed by guano should be reported through use of a Hazard Report (see 0) and a NOTAM should be issued (see 5.2.2 Note 3) pending proper repair, cleaning or repaint.

7.4.1.1 Fixed Obstacles

a) Fixed obstacles which present a hazard to flight operations shall be readily visible from the air. If a paint scheme is necessary to enhance identification by day, alternate black and white, black and yellow, or red and white bands are recommended, not less than 1.5 ft. (0.5 m) nor more than 20 ft. (6 m) wide. The use of "Day-Glo" orange bands may also be acceptable.
b) Obstacles to be marked in these contrasting colors include any lattice tower structures and crane booms, in addition to obstacles which are close to the helideck or the LOS boundary. Similarly, parts of the leg or legs of jack-up units adjacent to the helideck area which extend, or can extend, above it should also be marked in the same manner. Lattice towers should be painted in their entirety.
c) Where obstacles infringing the OFDS have been accepted by the owner and helicopter operator, the white perimeter line shall be overlaid by hatched yellow and black diagonal bands of 8 in. (20 cm) wide to mark the area defining the width of the obstacle below plus 12 in. (30 cm) on each side to indicate to flight crew that an infringement of the OFDS below the helideck is present in that sector and take-off over the marked area should only be performed when safe clearance is guaranteed from obstacles below the helideck in the event of an engine failure for the type of helicopter operated using the approved performance charts in the Ops manual at take-off. See Figure 8.

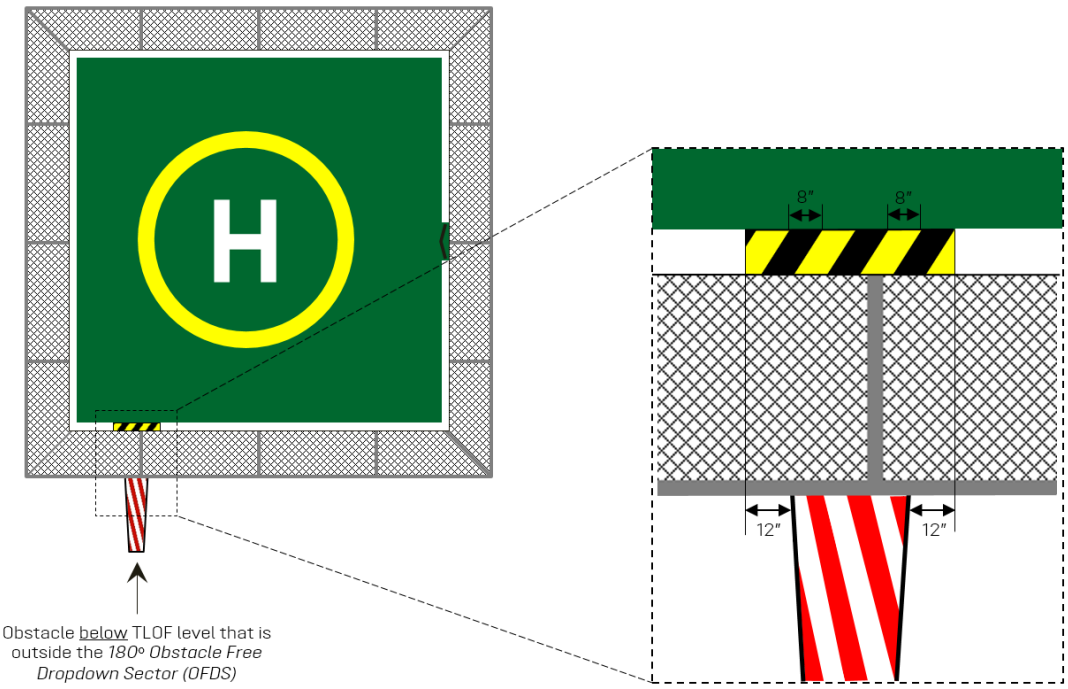


Figure 8: Obstacle Warning Marking for OFDS

Note 1: Alternative conspicuous color paint schemes should be considered for clearly differentiating the vent pipes or flare piping, etc. in the vicinity the helideck from its surroundings/environment, especially on smaller legacy helidecks.

Note 2: Because they are thin and particularly difficult to see, whip antennas should not be placed within 1.5 ft. (5 m) of the edges of the LOS, even if technically they meet the obstacle clearance requirements.

7.5 Lighting Requirements

See RP Nbr: 161 Section 7 for additional guidance.

7.5.1.1 Perimeter Lighting

Perimeter lighting is mandatory for helidecks where night, low visibility or IFR helicopter operations may be performed. Perimeter lights shall be green as prescribed in HSAC RP Nbrs: 161 and 162 and are required to delineate the TLOF. The perimeter lights shall be uniformly spaced at intervals on not more than 10 feet and a minimum number of four lights each side including a light at each corner (if not a circular helideck).

Perimeter lights should be outboard and adjacent to the TLOF and shall not protrude more than 2 inches above the deck surface. The lights should be guarded with lenses, have no exposed wiring, and be located so as not to be an obstruction. Any lighting inboard of the perimeter line for the TLOF shall be flush mounted.

Note: When LED Perimeter Lights are installed on the facility and Night Medevac Operations or other helicopter operations at night using Night Vision Goggles (NVGs) are anticipated, the LED Perimeter Lights should be compatible with the NVG's in use as otherwise the perimeter lights will not be visible through NVG's.

7.5.1.2 Flood Lighting

Adequate shielding shall be used on any floodlighting (when installed) that could disorientate (glare) the pilot during an approach for landing.

7.5.1.3 Obstruction Lighting

Obstructions that are that could present a flight hazard should be marked with omni-directional red lights as prescribed in RP 161. Where the highest point on the facility exceeds the elevation of the helideck by more than 50 feet (15 meters), an omni-directional red light shall be fitted at that point, with additional such lights fitted at 35 feet (10 meters) intervals extending from the elevation of the helideck to the highest point of the obstruction. Alternatively these obstructions may be indirectly illuminated with flood lights from the bottom upward as long as the lights do not create a glare problem for flight crew during approach and landing phase of the flight.

7.5.1.4 TDPM and H Lighting

If helideck surface lighting is used for the TDPM and H, the system for securing the LEDs to the surface should be carefully reviewed to ensure the method of attachment will not cause damage to the helicopter landing gear. In addition Note 1 in Paragraph 7.5.1.1 should be considered for TDPM and H lighting.

7.5.1.5 Helideck Status Lighting

As specified in HSAC RP Nbrs: 161 and 162, red strobe helideck status lighting shall be installed on all manned facilities and shall always be turned on, indicating the helideck is closed to operations unless the facility is prepared for helicopter operations and the helideck team has provide a "green deck" and is ready for helicopter operations, at which point the Helideck Status Light(s) will be turned off. This procedure also mitigates wrong deck landings as the switching switching off of the status lights can be seen as a visual confirmation of the 'green deck'. When status lights remain on, that particular facility was either not the one that was prepared for helicopter landing or the helideck team forgot to turn off the status light(s). In either case, the flight crew can now challenge by radio prior to potentially landing on the wrong and unprepared helideck. See also 8.12 and 7.5.1.5.

7.5.1.6 Uninterruptable Power Supply (UPS)

An emergency power supply shall provide power to the perimeter, helideck status and obstruction lighting and to lighting along the helideck access and egress routes and fixed base aviation radios. See RP Nbr: 161 paragraph 7.7 for further details, inclusive of time requirements, etc.

7.6 Weather

7.6.1 Weather Reporting and Equipment

Providing accurate aviation weather from offshore helidecks for both current and forecast conditions shall be a priority for all flight operations.

For long term operations, where appropriate, use of personnel trained and certified as aviation weather observers or an Automated Weather Observation System (AWOS), which also provides certified aviation weather is recommended. In any case, for AWOS only stations, there shall be a backup capability of a trained weather observer.

For placement of weather observation stations, the following guidance from the FAA may be used where none is provided locally.

a) One weather station for each airbase area encompassing an area of 10 miles in circumference or less, or
b) Multiple weather stations for larger areas (two AWOS or one AWOS and one other weather station with a trained weather observer may cover field areas covering up to 60 x 80 miles).

When provided, weather reporting capabilities shall include the items specified in 7.6.2 through 0 below which provide:

a) wind speed and direction,
b) barometric pressure,
c) temperature,
d) visibility, and
e) ceiling height.

Sea state shall also be provided for helideck operations and for floating facilities helideck pitch, roll and heave data (See Definitions, Section 4.1).

7.6.1.1 Weather Equipment Maintenance

See APPENDIX 7 – Automated Weather Observation System (AWOS) Monthly Maintenance Program.

7.6.1.2 Back-Up Weather Equipment

The following shall be provided, and be calibrated on an annual basis

a) Hand held anemometer giving wind direction in degrees magnetic
b) Air temperature gauge
c) Barometer

7.6.2 Windsock

As a minimum, one windsock shall be provided for ALL facilities. It shall be situated in accordance with the required obstruction clearances in clear and unobstructed airflow for 360 degrees and shall give a clear indication of the direction and speed of the wind blowing across the helideck. In some situations, where obstructions block wind flow, a secondary windsock shall be required to cover as a minimum the wind rose area where the primary windsock is inaccurate.

The windsock should be readily visible to the pilot on the approach (at a height of at least 600 ft. (200 m), in the hover and whilst touched down on the surface of the TLOF, and prior to take-off.

A windsock made of fabric of orange color and shall be illuminated internally or by external lights where night-, IFR- or lower visibility flights are anticipated. This windsock lighting should not be a glare hazard to pilots. A windsock shall be a truncated cone made of lightweight (mass) fabric and should have the following minimum dimensions: length 4 ft. (1.2 m), diameter (larger end) 14 in. (0.3 m) and diameter (smaller end) 8 in. (0.15 m).

> **Note:** Metal wind indicators are not acceptable as they have been known to freeze in position and do not provide a visual wind speed.

7.6.3 Weather Equipment Requirements for Visual Flight Rule (VFR) Operations

Weather Equipment Required for VFR Operations	
In addition to a windsock noted above, manned helidecks shall be equipped with weather station with the following:	
1	Temperature gauge, and
2	Barometric gauge, and
3	A means of providing cloud ceiling height and visibility (either with a trained weather observer (see Section 12) or Automated Weather Observation System (AWOS), and
4	A means of relaying this information to the helicopter pilot.
5	Ability to report sea state which may be estimated visually or by using wave measurement equipment, and
6	Offshore floating facilities must also have a means of measuring helideck pitch, roll and heave (see 0).

Table 6: Weather Equipment Required for VFR Operations

7.6.4 Weather Equipment Requirements for Instrument Flight Rule (IFR)/Night Operations

Weather Requirements for IFR or Night Operations	
For areas where IFR or night operations are to be conducted, the weather station must provide all the items in 7.6.3 above and in addition the following will be provided:	
1	The weather observer shall be trained in an approved weather observation course resulting in certification, and
2	Consideration should be given to providing AWOS with certified weather capabilities, and
3	Dew point shall also be provided.

Table 7: Weather Requirements for IFR or Night Operations

7.7 Communications

7.7.1 Normal Operations

All manned offshore facilities will have aviation VHF radios (with back-ups) dedicated to air traffic capable of communicating with the pilots during any flight operations. These shall include base station (fixed radios) in the radio room/control center and portable radios with headsets to be used by all helideck personnel.

Pilots will request via radio and be provided by the facility the weather, helideck status, etc. when inbound for landing and prior to departure. Procedures to be followed for landing and departing helicopters are detail in section 9.3.

Facility managers will alert response crews as necessary and maintain radio watch while helicopter operations are being conducted.

The radio call sign of the installation shall agree with the installation identification marking on the helideck.

The Radio Operator/HLO shall be able to transmit and receive and change frequencies on the radio while seated at his work station.

A digital recorder with direct connection to the radio systems should be installed and should record a minimum of 4 hours on a continuous loop.

7.7.2 Vessel/Tanker Operations

See for 8.14 for tanker operations communications.

7.7.3 Emergencies

7.7.3.1 Loss of Communications During Helicopter Operations

Even though modern radio equipment is reliable, radio failure between the helicopter and the helideck crew cannot be excluded. In practice, a suspected loss of contact will arise when a helicopter fails to respond when called or if the frequency becomes silent. In the event of a suspected radio failure, contact should be made with another member of the helideck crew or the facility radio operator so that the helicopter pilot can receive information.

7.7.3.2 Loss of Communications During a Facility Emergency

In the event of communications failure or loss of communications during a facility emergency, pilots or operations personnel attempt to contact the company owning or operating the helideck by telephone. Contact should be made before the pilot departs home base/point of departure, if possible, to advise of intentions, estimated landing time, and obtain landing permission if necessary.

See 9.9 for light signals to be used during communication failure and ICAO Annex 2 for standard hand signals to be used.

7.7.3.3 Aircraft Emergencies

All manned facilities shall have as part of their Emergency Response Plan communications to be used in the event of a crash on the helideck with fire, response for a ditched aircraft in vicinity of the facility, a fuel spill, a helicopter roll-over on the helideck or other aircraft related emergencies. These may include for ditched aircraft necessary communications to be used with vessels or the aircraft crew.

7.8 Fuel

Helicopter fueling stations, including hose reels and nozzles, shall be located to avoid obstructing any access or egress route serving the helideck, and installed so as not to protrude above the helideck. See 10.7 and with Attachments for Inspection and Maintenance Requirements and Checklists.

7.8.1 Helicopter Rapid Refueling (HRR)

Helicopter Rapid Refueling (HRR) or Hot Refueling, engine(s)/rotors operating, can be conducted safely when utilizing trained personnel and observing safe practices. This recommended practice provides minimum guidance for HRR, as outlined in NFPA and industry practices.

> **Note:** High winds or marine vessels, barges, MODU'S, etc. (due to Vessel/facility motion) HRR operations present additional potential hazards to helicopter operations (blade flex; aircraft movement, etc.) that shall be considered before undertaking HRR operations.

Only turbine engine helicopters fueled with JET A or JET A-1 with fueling ports located below any exhausts should be fueled while (an) onboard engine(s) is/are operating.

HRR Procedures		
Helicopter fueling while an onboard engine(s) is operating shall only be conducted under the following conditions:		
1	An FAA or equivalent licensed helicopter pilot is at the controls and a trained refueler attending the fuel nozzle during the entire fuel servicing process. The pilot monitors the fuel quantity and signals the refueler when the desired quantity is reached.	
2	Any activity associated with rotors turning (i.e. passenger embarking/disembarking; loading/unloading baggage/cargo; etc.) shall be completed prior to HRR operations. With rotors turning, personnel shall only approach the aircraft when authorized to do so. Approach shall be made via safe approach path/walkway or "arc" remain clear of all rotors.	
3	Passengers shall be de-boarded to a safe location prior to HRR operations. When the pilot-in-command deems it necessary for passenger safety that they remain onboard, passengers shall be briefed on the evacuation route to follow to clear the area.	
	a	Passengers shall not board or disembark during HRR operations nor shall cargo be loaded or unloaded
	b	Only designated personnel, trained in HRR operations shall conduct HRR operations. Qualification and written authorization to include safe handling of the fuel and equipment. The helicopter Operator shall have detailed instructions for these procedures in their Operations/Safety Manual.
	c	All doors, windows, and access points allowing entry to the interior of the helicopter that are adjacent to or in the immediate vicinity of the fuel inlet ports shall be kept closed during HRR operations.
	d	Doors on the opposite side of the helicopter from the fuel inlet port in use for refueling shall be open and a helideck team member shall attend the doors and be on standby for assistance in potential evacuation of helicopter occupants during an emergency.
	e	Pilots will insure that appropriate electrical/electronic equipment is placed in standby-off position, to preclude the possibility of electrical discharge or other fire hazard (i.e., weather radar is on standby and no radio transmissions are made).
	f	Smoking is prohibited in and around the helicopter during all HRR operations.
4	A fireguard with portable CO_2 extinguisher shall be positioned near the refueler to respond if necessary.	

Table 8: HRR Procedures

The HRR procedures are critical and present associated hazards requiring attention to detail regarding QC, weather conditions, static electricity, bonding, and spill/fire potential.

Note: For detailed guidance, please refer to National Fire Protection Association Document (NFPA) 407, as shown in the References at Section 0 for fuel systems.

7.9 Security

7.9.1 Passenger Credentials

Passengers must have a current government photo identification (ID) to board their flight and retain it in their possession.

7.9.2 Security Screening

Prior to boarding, passengers' name(s) shall be confirmed against the passenger manifest with the photo identification. Positive control of the passengers shall be maintained after this check.

If for some reason positive control is not maintained, the identification check must be reconfirmed prior to boarding. At normally unmanned facilities this is a pilot responsibility.

Local security screening procedures shall be in place to identify prohibited items inclusive of dangerous goods on the passenger's person or in baggage/cargo before boarding a flight.

7.9.3 On the Helideck

On manned facilities, passengers are not permitted on the helideck unless escorted by a HLO. Passengers shall follow all Helideck team member directions.

Passenger bags will normally be moved to and from the helicopter baggage compartment by designated helideck personnel. Preference is to separate baggage/cargo movements from loading/unloading and passengers. This ensures the entire helideck team can be focused on these separate tasks increasing safe operations and positive passenger control.

7.9.4 Refusing Transport

The pilot shall refuse transport to personnel who do not comply with the requirements stated in this RP.

The pilot has complete authority to refuse transport to 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, as if under the influence of drugs, alcohol, etc. or in a altered state of mind.

7.9.5 Manifests

Only properly manifested passengers, baggage, and cargo are allowed on flights. Manifests shall contain passenger names, employers, and destinations, accurate number of bags for each passenger, and accurate weights for all passengers, baggage, and cargo. See 9.12.4 for additional information.

7.9.6 Drugs and Alcohol

Possession or transport of illegal drugs, drug paraphernalia, otherwise legal but illicitly used substances, prescribed or over-the-counter drugs not used for their authorized purpose, and alcoholic beverages is prohibited.

Prescription drugs may be carried in passenger baggage, but passengers shall have proof of valid prescription. Prescription medicine must be in its original packaging, with the original label including the passenger's name and in an amount congruent with the scheduled period offshore.

When a passenger has a pre-existing medical condition where emergency medication could be needed at any time during flight (e.g. heart condition, asthma, etc.), the passenger with the medical condition is allowed to bring the emergency medication onto the helicopter in the cabin on his/her person. See paragraph 9.12.8 "Fitness to Fly" for further details.

8 FLIGHT OPERATIONS

8.1 Manual/Matrix of Permitted Operations (MOPO)

The Manual of Permitted Operations (MOPO) (See 7.2.4) which provides a listing operations which can be conducted with/without restrictions shall be developed for every facility with a helideck.

8.2 General

Operations are always at the pilot's discretion and the helideck weight and limitation markings must be visible to the pilot.

Helicopters operating on an offshore helideck whether landing or parking the helicopter will have the skid/wheel assembly no closer than 3 feet from helideck edge.

8.3 Night or Instrument Flight Rule (IFR) Operations

To be considered suitable as a night or IFR destination, the facility shall meet the following guidelines:

a) Helideck TLOF size shall be a minimum of 0.83D. Weight and size capability to accommodate the helicopter as loaded.
b) Adequate night lighting to include obstruction lighting, lighted windsock, floodlighting and helideck perimeter lighting per HSAC RPs 161 and 162 is required.

Note: TDPM and H lighting may help mitigate the "black hole effect, but proper flooding lighting can also achieve this while providing the required visibility on the helideck for safe unloading/disembarking and loading/embarking at night.

Aviation VHF communication system capable of providing direct radio contact with the helicopter crew to provide landing information, winds/weather and/or status of helideck

Facility must have a weather system to provide accurate weather and will provide any helideck restrictions/limitations to the operator before flight departure.

8.4 Restricted Helideck Operations

It may be necessary to provide some operational limitations (restricted payloads, etc.) for helicopter operations for issues such as helidecks less than 1.0D, turbulence, gas discharges, obstacles, etc. These shall be developed in cooperation with the helicopter operator and such restrictions shall be listed in the HOM and HIP. Significant restrictions shall also be distributed by NOTAM.

8.5 Helideck Parking Areas

HSAC RP 161 paragraph 4.3.4 provides guidance on design and use of helidecks with adjoining parking areas for multi-helicopter operations.

Note: Medium (12 passenger transport) and larger helicopters shall not land on any offshore helideck where a light helicopter (9 passengers or less) is parked unless the light helicopter is properly tied-down to the helideck and has the main rotor also tied-down.

8.6 Maintenance Helideck

If a helideck is being designed to accommodate an offshore-based helicopter (See HSAC RP 161 Annex A), it must be large enough to allow a mechanic performing routine maintenance to safely reach all parts of the helicopter. A maintenance helideck will require additional equipment and storage areas.

8.7 Second Helicopter Operations to Helidecks Already Occupied with a Helicopter

Included in HOM and/or Helicopter Operator's Operations Manual shall be procedures to be followed when landing a second helicopter on a helideck that is normally only approved for one helicopter (first helicopter has a maintenance fault, etc.). Items to be considered include the following:

a) Determine if alternate means, Vessel/facility, hoisting, etc. can fulfill requirements.
b) Operations must be daylight only and must be specifically allowed by the Helicopter Operator's Operations Manual.
c) Use smaller helicopter, if possible to fulfill requirements.
d) Minimum obstruction clearance during landing or take-off must not be less than 1/3 RD rotor diameter or 4 meters, whichever is the greater. Any such obstructions must be located within the area swept by the 8 o'clock forward through to the 4 o'clock position of the landing helicopter as viewed from the flight deck.
e) The stranded helicopter shall have all doors, latches, cowlings, etc. closed and should be fully tied-down (incl. blades) with its landing gear/skids not closer than 3 feet from the helideck perimeter edge.
f) No occupants shall be in the stranded helicopter.
g) The helicopter pilot has the final decision on whether or not to land on the occupied deck.
h) Before any flight takes place, the Helicopter Operator will request confirmation from the installation that the helideck is structurally capable of supporting the combined weights of both the incoming helicopter and the helicopter or other obstruction on the helideck.
i) Helicopter Operator and offshore manager shall discuss risks involved in the operation and reach agreement that the operation may be conducted safely when the applicable risk mitigation measures have been applied.

Note: In any case, the maximum number of helicopters allowed on one deck is two.

8.8 Closing Helidecks

A yellow "X" marked over a red background diagonally from corner to corner across a helideck or heliport touchdown area is the universally accepted visual indicator that the landing area is closed and that helicopter operations are not permitted. The following practice is recommended.

8.8.1 Temporary Closing

A temporary prohibited landing marker can be used for hazards of an interim nature. This marker could be made from vinyl or other durable material in the shape of a diagonal "X".

The marker shall be 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.

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.

These markers MUST be removed when the hazard no longer exists. Example marking:

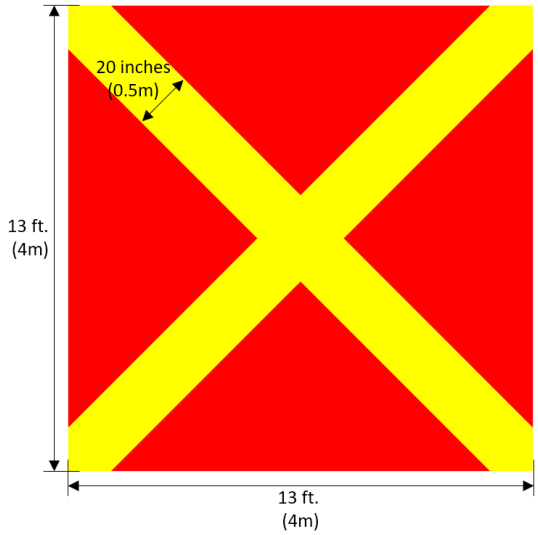


Figure 9: Illustration of Panel Used to Temporarily Close a Helideck

Notify company aviation departments, helicopter operators or bases, and manned facilities of the pending temporary closure so the Notice to Airmen (NOTAM) system can be activated for the operation and the temporary helideck closure.

Helideck Status lights shall remain "ON" for manned facilities (see 7.5.1.5)

8.8.2 Permanent Closing

If a helideck is to be permanently closed, the markings as prescribed in 8.8 shall be used and shall be painted on the landing area. A NOTAM shall be issued when the helideck is closed and the HIP revoked.

8.9 New Facilities

When a new offshore facility or vessel arrives in the area, before the initial flight to it, a safety brief shall be held between the Operator, the facility/vessel HLO and a facility/vessel executive (Installation Manager, First Mate, Safety Officer, etc.) to agree on the procedures to be used. The results of this briefing shall be documented and copied to all applicable parties.

During the initial visit to the facility, the following will be reviewed with the facility by the operator:

New Facilities Review Items	
Items to review on initial visit to new offshore facility:	
1	Review of Facility Helideck Operations Manual (HOM)
2	Emergency Response plan will be reviewed for any gaps with the Helicopter Operator
3	Passenger handling procedures (Helicopter Operator shall provide a current Passenger Safety Briefing Video for future use)
4	Review of any open issues from the last helideck inspection
5	Review helideck information plate (HIP), if the HIP is not available, appropriate photos shall initially be reviewed pending development of the HIP.
6	Weather reporting requirements
7	Fuel system procedures (if installed)
8	If helideck team is not familiar with aircraft type flown, each hitch shall schedule a helicopter familiarization with the Helicopter Operator.

Table 9: New Facilities Review Items

8.10 Crane Operations

The following recommended practices will minimize risks during simultaneous crane and helicopter operations.

8.10.1 Personnel Awareness.

Crane operators and pilots shall develop a mutual understanding and respect of the others' operational limitations and cooperate in the spirit of safety.

Pilots need to be aware that crane operators sometimes cannot release the load to cradle the crane boom, such as when attached to wireline lubricators or supporting diving bells, and

Crane operators need to be aware that helicopters require warm-up before takeoff, a cool down before shutdown, and cannot circle for extended periods of time due to fuel consumption.

8.10.2 Crane Operator

The following is mandatory for cranes on facilities with potential to interfere with helicopter operations (including approach/departure paths):

a) Be equipped with a red rotating beacon or red high intensity strobe light connected to the system powering the crane, indicating the crane is under power;
b) Be designed to allow the operator a maximum view of the helideck area and should be equipped with wide-angle mirrors to eliminate blind spots; and
c) Paint crane boom tips, headache balls, and hooks with high visibility international orange.

Crane Operations During Helicopter Operations	
1	Pilots are not to approach to the helideck, land on, takeoff from, or have rotor blades turning on any facility if any crane that could infringe the helideck, or the approach and departure lanes, is in motion, powered up, or the crane operator is in the crane cab. The pilot will also verify that the crane beacon is off.
2	The HLO/facility owner is responsible to ensure that cranes with potential to impact helicopter operations do not operate while helicopter operations are in progress.
3	Cranes not in use that potential to impact helicopter operations shall have their booms cradled, if feasible. If in use and unable to cradle, the crane's boom(s) are to be pointed away from the helideck and the crane shutdown for helicopter operations and the operator outside the cab.

Table 10: Crane Operations During Helicopter Operations

8.11 Perforating Operations

Explosive charges used in conjunction with perforation operations offshore can potentially be prematurely detonated by radio transmissions, including those from helicopters. The following practice is recommended.

8.11.1 Personnel Conducting Perforating Operations:

Whenever perforating operations are scheduled and operators are concerned that radio transmissions from helicopters in the vicinity may jeopardize the operation, personnel conducting perforating operations shall notify company aviation departments, helicopter operators or bases, and nearby manned facilities of the pending perforation operation so the Notice to Airmen (NOTAM) system can be activated for the perforation operation and provide detailed procedures to be followed or perhaps temporary helideck closure.

8.11.2 Pilots

Pilots when operating within 1,000 feet of a known perforation operation will avoid radio transmissions from or near the helideck (within 1,000 feet). Radio transmissions include signals emitted from aircraft radar and transponders, which shall be completed via alternate communication means available on the rig or facility.

Whenever possible, make radio calls to the facility being approached or to the Flight Following Communications Center at least one mile out on approach. Ensure all communications are complete outside the 1000-foot hazard distance. If no response is received, or if the facility is not radio equipped, further radio transmissions shall not be made until visual contact with the deck Indicates it is open for operations.

Note: Hand signal and light signal procedures (see 9.9) may be used as alternative to radio communications.

8.12 Hydrogen Sulfide Gas (H_2S)

Sulfide gas in higher concentrations (300+) parts per million (PPM) can cause loss of consciousness within a few seconds and presents a hazard to pilots on/near offshore helidecks. When operating in offshore areas that have been identified to have concentrations of Hydrogen Sulfide gas, the following practice is recommended.

8.12.1 Pilots

Ensure approved protective air packs are available for emergency use by the crew on the helicopter.

If shutdown on a helideck, request the supervisor in charge provide a briefing on location of protective equipment and safety procedures.

If landing to a helideck and the helideck status light was OFF and the status light turns ON and/or the H_2S red beacon light is observed or an unusually strong odor of "rotten eggs" is detected pilots shall:

- If the rotors are running during H_2S release, the helicopter shall depart if safe to do so
- If the aircraft is shut down, the pilots will don the protective masks and follow platform instructions after exiting the helicopter to an area upwind.

8.12.2 Oil Field Supervisors

For facilities where Hydrogen Sulfide may present a hazard, a red rotating beacon or red high intensity strobe status light adjacent to the primary helideck stairwell or wind indicator on the structure shall always be turned on to provide visual warning of the H_2S discharge hazard. If the beacon is located near the stairwell, HSAC RP Nbrs: 161 and 162 as applicable shall be reviewed to ensure proper clearance distances from the helideck.

- Notify nearby helicopter operators and bases of the H_2S discharge hazard and advise when hazard is cleared.
- Provide a safety briefing to include location of protective equipment to all arriving personnel.
- Windsocks shall be clearly visible to provide upwind indication for the pilot.
- HLOs shall notify the pilot of activation of the H_2S system.

8.13 Gas Venting - Operations Near Gas Vent Booms/Flare Towers

Ignited flare booms can release a large volume of natural gas and create a hot fire and intense heat with little time for the pilot to react. Likewise, un-ignited gas vents can release reasonably large volumes of methane gas under certain conditions. Thus, operations conducted very near un-ignited gas vents require precautions to prevent inadvertent ingestion of combustible gases by the helicopter engine(s). The following is recommended.

8.13.1 Pilots

Gas will drift upwards and downwind of the vent.

- Plan the approach and takeoff to observe and avoid the area downwind of the vent, remaining as far away as practicable from the open end of the vent boom.
- Do not attempt to start or land on an offshore helideck when the deck is downwind of a gas vent unless properly trained personnel verify conditions are safe.

8.13.2 Oil Field Supervisors

For facilities where venting of large amounts of un-ignited raw gas may occur, the Helideck Status Light adjacent to the primary helideck stairwell or wind indicator shall always be turned on when venting occurs to provide visible warning of hazard. If the Helideck Status Light is to be located near the stairwell, HSAC RPs 161 and 162 as applicable shall be reviewed to ensure proper clearance from the helideck.

- Notify nearby helicopter operators and bases of the hazard for planned operations.
- Windsocks or indicator shall be clearly visible to provide upward indication for the pilot.

> **Note:** When the Helideck Status Light is on, the helideck is considered unsafe and landing shall be postponed until the hazard is cleared and the Helideck Status Light is turned off.

8.14 Helicopter - Ship/Tanker Operations

8.14.1 General

The interface of helicopters and ships/tankers is complex and may be hazardous unless appropriate procedures are in place and coordinated among all parties. The following recommended practices will minimize risks during helicopter/tanker operations.

> **Note:** Generally, permission will not be granted to land on tankers during mooring operations or while maneuvering alongside another tanker.

Management, operations, and pilots shall be familiar with and apply the operating safety standards set forth in International Chamber of Shipping (ICS), "Guide to Helicopter/Ship Operations" (see References Paragraph 3), establishing operational guidelines/standards and safe practices sufficient to safeguard helicopter/tanker operations. Where variances or waivers to this document are sought, qualified aviation personnel should be involved in the process.

Appropriate plans, approvals, and communications must be accomplished prior to reaching the Vessel/facility, allowing ship/tanker crews sufficient time to perform required safety preparations and position crew members to receive or dispatch a helicopter safely.

Helicopter/tanker operations, including landings/departures, shall not be conducted until the helicopter Pilot-In-Command (PIC) has received and acknowledged permission from the bridge of the tanker/ship.

Helicopters shall be equipped with FM radios that are compatible with marine bands or alternatively vessels equipped with VHF air frequencies.

Tanker Operations		
1	Helicopter/tanker operations shall not be conducted during product/cargo transfer.	
2	Helicopter/tanker operations, including landings and departures shall not be conducted unless the following conditions are met:	
	a	The pilot has positive communications with the bridge of the tanker. Appropriate approvals and direct communications with the bridge of the tanker must be maintained throughout all helicopter/tanker operations.
	b	For vessels taking on product and not equipped with an Inert Gas (IG) system, a risk assessment shall indicate that air operations can be conducted safely or otherwise identify operational restrictions necessary to maintain safe operations.
3	For vessels equipped with an IG system, simultaneous loading/transfer of product and landings by helicopters may take place provided the HLO/Radio Room Operator ascertains that the system is operating as designed prior to authorizing a landing; and,	
	a	The HLO/Radio Room Operator (or designee) shall maintain a watch on the indicating system during air operations; or,
	b	In lieu of a. and b. above, a visual, status-indicating system is visible to the pilot while conducting air operations.

Table 11: Tanker Operations

8.15 Weather Planning and Operations

Facility owners and offshore dispatchers shall be aware of the Helicopter Operator's and oil industry company requirements regarding applicable weather minimums and the impact on operations.

8.15.1 Adverse Weather Planning

8.15.1.1 Purpose

Helicopter Operator's and facility owners shall mutually agree on an adverse weather policy. The purpose of the Adverse Weather Policy is to provide open dialog between the Operator and the facility owner when weather conditions become marginal for normal aircraft operations and achieve agreement on safe operating limits and thresholds when flight operations and helideck operations are suspended. The dialog may identify mitigating measures necessary to continue operations at an equivalent acceptable level of safety or result in the decision to suspend operations.

> **Note:** The oil industry companies will always have the option to delay or cancel a flight, even when conditions are technically within limits.

8.15.1.2 Factors to Consider

Among factors that shall be considered in determining if flights should be performed in adverse weather are those listed below:

a) Helicopter Operator's compliance with regulatory requirements, helicopter company Operations Manual, and Affiliate weather and operational limitations.
b) Safe movement of passengers and operation of the aircraft at the landing/departure site.
c) Rescue provisions, which will provide a reasonable expectation of rescue both enroute and at the landing site, in the event of a forced landing.
d) Degree of urgency of proposed flights. Non-essential flights should be postponed to reduce exposure to inclement weather.

8.15.1.3 Adverse Weather Criteria

a) **General**: Adverse weather can exceed aircraft operational limits or affect the safety of flight operations. Factors such as wind, temperature, precipitation, sea state, visibility, cloud base, lightning, rescue capabilities, and darkness need to be considered. These factors shall be discussed between the aviation Operator and mutual agreement reached in determining if operations should continue or cease. Mutually agreed criteria can be placed in the MOPO (APPENDIX 2 – Sample MOPO Matrix).
b) **Criteria and Evaluation**: Among the specific weather or environmental criteria that should be evaluated for inclusions in the adverse weather limitations in cooperation with the helicopter operator based on specific helicopter Flight Manual Limitations include the following:
    1) Lightning and thunderstorms.
    2) Winds (Steady state, gusts and crosswinds).
    3) Wave Height and water current.
    4) Facility movement for floating facilities (pitch, roll and heave).
    5) Temperatures (severe heat or cold).
    6) Ice, snow, freezing precipitation.
    7) Visibility.
    8) Cloud height and conditions (fog, etc.).
    9) Night time.
c) **Decision Zones**: The three decision levels concerning flight operations and adverse weather are:

Decision Level	Restrictions/Limitations
ROUTINE	No additional approvals are required
CAUTIONARY	There shall be agreement between the helicopter operator that these flights can be performed without compromising safety, and that any additional operational limitations applicable to the conditions will be followed. The facility owner shall review all scheduled operations and evaluate if the flights are essential to meet objectives, or if they should be delayed. The helicopter operator shall coordinate with the facility for flights in this zone and achieve consensus on how to proceed.
UNSAFE	Flights are not recommended

Table 12: Decision Zones (Legend)

d) **Marginal Conditions:** If conditions are within the parameters described for a decision level, flight operations can continue using the helicopter and guidelines allowed for that decision level. If any condition becomes marginal for that specific decision level, then the helicopter operator and the

facility shall discuss if operations should continue as prescribed for that decision level, or if the more stringent criteria in the next decision level shall be used. Both parties should be in agreement for operations to continue.

e) **Conditions Exceed Decision Level Criteria:** If conditions exceed the criteria for a particular decision, then the parameters for the next decision level shall be used.

f) **Example Tables of Decision Levels and Criteria that Could Be Considered.** (this is a sample only that would need to be populated in cooperation with the helicopter operator). A MOPO (APPENDIX 2 – Sample MOPO Matrix) can be used as an alternative to this format). These controls are called Enhanced Operational Controls (EOC).

ROUTINE OPERATIONS		
CRITERIA	**RISKS**	**NOTES**
Daytime flights return to assigned base at least one hour before last light for offshore helicopters and all onshore inland operations for VFR only aircraft.	Reduced visibility at night	
Cloud Base equal to or above XXX feet		
Visibility equal to or above X miles		
Wind XX knots or less Crosswind below XX knots		

Table 13: Example Decision Zones - Routine Operations

CAUTIONARY OPERATIONS		
CRITERIA	**RISKS**	**NOTES**
Daytime flights cannot return to assigned base at least 30 minutes before sunset.	Reduced visibility	
Wind exceeds XX knots, but less than XX knot gusts. Crosswind below XX knots	Turbulence. Potential for helicopter damage if control is lost.	At Flight Manual limitations.
Mean Wave Height equal to or less than XX feet		Sea State exceeds helicopter type Float System Certification limits.

Table 14: Example Decision Zones - Cautionary Operations

UNSAFE OPERATIONS		
CRITERIA	**RISKS**	**NOTES**
Day time flights cannot return to assigned base by sunset	Reduced visibility	
Wind exceed XX knots or crosswind exceed XX knots	Turbulence. Possible damage to helicopter if control is lost.	Different than some Flight Manual limitations.
Fog limiting visibility to less than X miles	Helicopter has no slant visibility although the facility may have horizontal and/or vertical visibility	Not possible for helicopter to operate.
Lightning, severe turbulence or thunderstorm activity forecast	Loss of control	Unacceptable risk

Table 15: Example Decision Zones - Unsafe Operations

8.16 Helidecks on Floating Facilities

All floating facilities must have the ability to provide pitch, roll, and heave information to pilots prior to landing and as part of the routine facility weather report

8.16.1 Criteria for defining pitch, roll, and heave related information

a) **Pitch**: The angle between the absolute horizon and the plane of the helideck measured along the longitudinal axis of the facility.
b) **Roll**: The angle between the absolute horizon and the plane of the helideck measured along the lateral axis of the facility.
c) **Inclination**: The largest angle between the absolute horizon and the plane of the helideck.
d) **Heave period**: "Heave period" is time in seconds between the top of two heaves. If measuring equipment is not available the pilots shall use a standard heave period of 10 seconds for manual calculation.
e) **Significant Heave Rate (SHR):** The average of the one-third highest values of instantaneous heave rate recorded during the previous 20 minute monitoring period. If automated measuring equipment is not available, the pilots shall calculate significant heave rate manually by dividing maximum total heave (measured over the last 20 minutes) by half the motion period (heave period).
f) **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.
g) **Relative Wind Direction (RWD):** The 2 minute mean free stream wind direction relative to the longitudinal axis of a helicopter landed on the helideck.

8.16.2 Measurement of Pitch, Roll and Heave (PRH)

A method of measuring PRH shall be available and a means provided to transmit that data to flight crews prior to landing. The accelerometers for such measurements shall be located as close to helideck level and centerline as possible to provide accurate readings. The accelerometer readings shall be processed by sophisticated software that can produce accurate helideck level measurements of PRH regardless of the accelerometer location.

More sophisticated systems are capable of providing a calculated Measurement of Motion Severity (MMS) of the facility and a Motion Severity Index (MSI) which is the maximum expected value of the MMS expected over the next 20 minutes. These systems must also measure the helideck inclination (HI), and calculate the relative wind direction (RWD), and Wind Severity Index (WSI). UK document titled "Standard Measuring Equipment for Helideck Monitoring System (HMS) and Weather Data" is used as the reference for these guideline (see References at Section 3).

If the measurement system is capable of recording accurate helideck movements and provide the calculations indicated above in Criteria for defining pitch, roll, and heave related information, for at least twenty (20) minutes, then less restrictive limits indicated at Table 16 may be applied to specific floating facilities. Such variances must be allowed in the local helicopter operator's Operations Manual, and be documented in the facility HOM procedures/diagrams. The Helicopter Operator shall be consulted for relevant guidance before variances are implemented.

8.16.3 Monitoring

When a vessel/facility provides a 'Green Deck' and subsequently the helicopter lands, the intention is for that vessel/facility to maintain the existing heading while the helicopter remains on the deck. The monitoring station providing deck motion limits and wind data must be manned during the entire time the helicopter is operating on the deck or is on the deck without being fully tied-down.

The helicopter crew is to be notified immediately by radio if any of the following occurs: the vessel/facility goes off heading by 10 degrees or more, there is a Vessel/facility/installation or station keeping/handling problem, pitch/roll/heave exceeds the limits at Table 16, a significant change in the relative wind of 30 degrees or more, or there is any other abnormal event.

8.16.4 Pitch, Roll and Heave Limitations

Generally accepted industry maximum guidelines for pitch, roll, and heave limitations are shown below, but Operator's may have more stringent requirements and shall be followed.

Facilities that cannot provide helideck Inclination, MMS and MSI shall have a factor of 0.5 decrease to all the listed limitations.

Note: Deck Limitations are not applicable for takeoff.

Helicopter Category	Condition	Floating Helideck Category[1,3,5]								
		1 – Large Vessels, Semi Subs, FPSO, TLP and Spar Facilities, Tankers			2- Small Vessel with Stern or Mid-Ship Helideck			3- Small Vessel with Bow Helideck		
		P/R°	INC°	SHR	P/R°	INC°	SHR	P/R°	INC°	SHR
A Heavy/Heavy Medium Helicopters	Day	±3.0	3.5	4.3 (1.3)	±2.0	2.5	3.3 (1.0)	±2.0	2.5	3.3 (1.0)
	Night Semi Subs[4]	±3.0	3.5	3.3 (1.0)	Not Applicable			Not Applicable		
	Night Other[2]	±2.0	2.5	3.3 (1.0)	±2.0	2.5	1.6 (0.5)	**No Operations**		
B Medium/Light Twin/Single Engine Helicopters	Day	±4.0	4.5	4.3 (1.3)	±3.0	3.5	3.3 (1.0)	±3.0	3.5	3.3 (1.0)
	Night Semi Subs[4]	±4.0	4.5	4.3 (1.3)	Not Applicable			Not Applicable		
	Night Other[2]	±3.0	3.5	3.3 (1.0)	±2.0	2.5	1.6 (0.5)	**No Operations**		
Key	**P/R** = Pitch and Roll (Degrees), **INC** = Inclination (Degrees), **SHR** = Significant Heave Rate is feet (meters)/sec									
Helicopter Category	**A** = Heavy and Medium Heavy Helicopters with a MTOM greater than or equal to 17,600 pounds (8,000 kg), such as S92, EC225, EC332, AW189 **B** = All Medium. Light Twin and Single Engine Helicopters (not included in **A**) with a MTOM below 17,600 pounds (8,000 kg)									
Helideck Category	**1:** Semi-submersibles including floating jack ups and all large vessels including FPSOs, SPARs, TLPs, and tankers. **2**: Small vessels, e.g. Diving Support (DSV) and seismic vessels, with a helideck that offers good visual cues. This would normally be a stern or mid-ships deck offering view of the structure of the vessel through at least 90° (assuming the vessel is steaming more or less into wind). **3**: Small vessels with poor visual cues, such as a bow deck or a deck mounted above the bridge superstructure with the landing direction facing forwards (bow deck) or abeam (high deck).									

Notes:

1. For tanker mooring buoys (whose deck movement is measured by inclination rather than pitch and roll) the inclination limits are ±2° by day and ±1° by night regardless of aircraft category.

2. Floating Production Storage and Offloading (FPSO) night operations use "Night Other" limitations

3. The operational limitations for helicopter operations to mono-hull vessels with helidecks greater than or equal to eighty (80) feet above sea level are more restrictive than the chart above, may vary by helicopter model, and prior to operation to such vessels, the Operator shall be contacted for relevant guidance.

4. Tension Leg Facility (TLP) and Spar night operations – use "Night Semi Sub" limitations

5. Facilities that cannot provide helideck Inclination shall have + 0.5 added to all the listed limitations.

Table 16: Pitch, Roll and Heave Limitations

8.17 External Load Operations

Helicopter external load operations to offshore facilities will either be conducted on a scheduled/regular basis or on a specialist/ad-hoc basis.

8.17.1 Regular Loads

Helideck crew members shall be briefed and trained to act as load receivers and hook-up personnel by the helicopter operator. Assuring the same offshore personnel are regularly involved in external load operations and they are in current practice. Annual refresher training completed by the helicopter operator is required.

8.17.2 Specialist or Ad-Hoc Loads

These loads relate mainly to fixed facilities and cover flare tip changes, etc. The helicopter operator shall hold a pre-lift meeting with the facility operator to assess the work required, provide necessary training, and a conduct and document a safety review/risk analysis.

8.17.3 External Load Operational Requirements

External Load Operational Requirements		
External loads shall only be conducted when		
1	The helicopter operator has the appropriate and approved procedures for external load operations in their Operations Manual.	
2	Each external load has been pre-planned by the facility operator and helicopter operator to ensure the task is safely managed by competent personnel to ensure that risks to personnel, the helicopter and the facility are properly managed.	
3	Comprehensive procedures have been developed and implemented by the facility/Vessel/facility operator in cooperation with the helicopter operator when external loads are planned. These should include, but not necessarily be limited to, the following topics:	
	a	Helicopter Pilot and OIM/Master responsibilities
	b	Crew composition and responsibilities at the Installation.
	c	Personal protective equipment (PPE).
	d	Flight path and load receiving area.
	e	Pilot/facility crew communications, including a secondary means of communication in the event of primary communications means failure (both radio and hand signals).
	f	Procedures for safe static discharge and safe release of loads.
	g	Lifting equipment – selection, inspection and maintenance.
	h	Preparation of loads.
	i	Emergency procedures covering helicopter fault, snagged load, lifting equipment failures, abnormal load movements etc.

Table 17: External Load Operational Requirements

8.18 Winching (Hoisting) of Personnel

8.18.1 General

There may be a requirement to undertake winching of personnel to or from an Installation, MODU or vessel/facility. The operations may take place on the helideck, in a designated winching area (designed, marked and operated in accordance with 8.14, or otherwise suitable and pre-approved area on the facility/vessel/facility.

8.18.2 Guidelines

a) Facility/vessel operators shall identify areas on their facilities that are suitable for winching, in the event that the helideck or a designated winching area (on vessels without a certified helideck) becomes inaccessible to helicopters or personnel.
b) Winching areas require the surrounding area and area above the winching area to be clear of obstructions that could inhibit safe operations, particularly in high winds. In the case of floating structures and vessels, movement of the vessel/facility may further affect obstruction clearances.
c) All equipment required to perform winching operations shall be provided by the helicopter operator.
d) Where winching operations for a facility/vessel are anticipated, the facility/vessel operator shall develop procedures in conjunction with the helicopter operator.
e) Any personnel who will be called upon to assist with winching operations shall also undertake training on an initial and annual recurring basis.
f) The helicopter Operator shall have an approved Helicopter/Ship Operations Manual or Operations Manual Supplement outlining the following for winching operations:
    1) Responsibilities of crewmembers.
    2) Equipment standards.
    3) Approach and departure procedures.
    4) Weather limitations.
    5) Communications.
    6) Procedures at winching area.
    7) Emergency procedures.

8.18.3 Hoisting Operational Requirements

Hoisting Operational Requirements	
Hoisting to helidecks or hoisting areas shall only be conducted when:	
1	Authorized by the facility and helicopter operator.
2	Hoist areas on vessels are designed and marked to, and operations conducted in accordance with the International Chamber of Shipping (ICS) Helicopter Operations Guidelines. For other facilities the helideck or other suitable areas may be used if approved by the helicopter operator.
3	Hoisting is conducted during daylight hours other than in cases of emergency.
4	The weather conditions are not less than the VFR weather minima specified in the Helicopter Operator's Operations Manual
5	The Vessel/facility is fitted with a VHF Air radio with selectable frequencies and there is two way radio communications available between the helicopter and the vessel/facility.

Hoisting Operational Requirements	
Hoisting to helidecks or hoisting areas shall only be conducted when:	
6	The wind strength is not more than 30 mph.
7	The sea is not breaking over the vessel/facility's deck.
8	The vessel/facility is heaving less than 6 feet.
9	The vessel/facility is pitching, or rolling, less than 6 degrees from the mean.
10	Personnel not directly associated with the hoisting is not on the helideck during the operation.
11	During hoisting, a secondary rescue helicopter with the linked life raft systems is placed in ready standby status, if available.

Table 18: Hoisting Operational Requirements

8.18.4 Hoisting Safety Brief

Hoisting Safety Brief		
Prior to any flight involving hoisting to a vessel/facility, the Helicopter Operator and Marine Captains, facility owner, or their delegates, shall hold a pre-flight briefing by phone to confirm the following arrangements:		
1	The name and position of the vessel/facility for the expected time of arrival of the helicopter.	
2	The height of the superstructure above sea level.	
3	The length and width of the hoisting area and the size of the area that is clear of obstacles.	
4	The weather inclusive of known winds and current position course, speed of the vessel/facility.	
5	The communication frequency to be used and the call signs of the helicopter and the vessel/facility. International distress safety and calling – marine channel 16 (156.80 MHz), an alternate working frequency can be established after initial contact.	
6	Leader of the deck party has a portable radio for communication with the bridge and all deck crew has proper PPE?	
7	Whether the vessel/facility will be stationary using the vessel/facility's dynamic positioning system, or, if the vessel/facility will be underway, and the heading and speed of the vessel/facility at the time of the hoisting operation will remain constant. Vessel/facility to advise on any changes.	
8	Deck to be secured all loose objects	
9	Do not help hoist personnel unless requested, do not attach cable to Vessel/facility	
10	Vessel/facility radar to stand-by	
11	Full name and Company of the persons to be hoisted, and reasons for hoisting.	
12	If a medical transfer is necessary, the following information shall be discussed:	
	a	Nature of the patient's illness/injury and any special medical equipment required for the flight.
	b	Assessment of whether the patient requires a litter, rescue basket, sling/strop, or air rescue vest.

Table 19: Hoisting Safety Brief

8.19 Hazard Reporting

Providing accurate and timely information to pilots on the status of offshore helidecks is critical to conducting safe operations.

Hazard/Non-Conformity reports shall be submitted for any helideck hazards and follow-up actions shall be initiated. In particular, helicopter pilots or helideck inspectors should note the items listed at 7.3.6 above.

Pilots shall not attempt to land on an offshore helideck if a previously unknown obstacle appears to have been added, that could present a hazard to flight.

Helicopter Operators shall provide reported helideck hazard information to pilots and the owners of the facilities.

A number of operational hazards can develop on or near offshore helidecks or onshore heliports. These hazards can be minimized through procedures for proper notification or visual warning to pilots. Examples of hazards include but are not limited to the following:

a) Perforating operations, see 8.11
b) H_2S gas presence, see 7.3.7.6, 8.12
c) Gas venting, see 7.3.7.4, 8.13
d) Closed helidecks, see paragraph 8.8
e) Helideck hazards, see paragraph 7.3.6.

These and other operational hazards should be reported through timely dissemination of a written (NOTAM) for pilots by helicopter Operators. A NOTAM provides a written description of the hazard, time and duration of occurrence, and other pertinent information. Any potential hazard shall be communicated to helicopter operators or company aviation departments as early as possible to allow the NOTAM to be activated. Longer term hazards that cannot be eliminated shall also be added to the associated Helideck Information Plate (HIP) together with the mitigation procedures.

To supplement the existing NOTAM procedure and further assist in reducing these hazards, a status light on the helideck will provide a warning to an approaching helicopter of the safe landing status of the landing area.

9 HELIDECK MANAGEMENT

9.1 Helideck Team Composition

For manned facilities, the minimal helideck staff for management of passengers is three (3) as shown below:

1) **Helicopter Landing Officer (HLO)**. If the primary HLO is also assigned additional safety critical tasks (e.g. Medic) then a competent back-up HLO shall be available during every hitch, and
2) **Helideck Assistant (HDA)**, and a
3) **Fire Guard (FG)**.

A critical factor to consider is the number of persons (passengers and helicopter crew) carried on the helicopter and the associated rescue time of the persons on board (POB) the helicopter. Additional HDA might be necessary as POB numbers increase.

Note 1: These can all be secondary duties for facility personnel, as long as the team members are properly trained, competent and available to execute these safety critical duty. (See Section 12).

Note 2: There shall be additional trained personnel on each shift as back-up to all helideck team positions.

Note 3: The manning levels prescribed above are considered minimal, assuming the manning on the facility has this minimum number of personnel. If not, consideration should be given to reduce the number of passengers per flight or apportion the necessary duties appropriately among available personnel.

9.1.1 Helicopter Landing Officer (HLO) Responsibilities

It is the duty of the HLO to supervise and run day to day operations on the helideck during helicopter visits, including updating the installation manager in writing at regular intervals regarding the status of the helideck, equipment and services. The HLO shall ensure that:

a) Necessary steps are taken to deny unauthorized persons access to the helicopter deck prior to take off and landing.
b) The deck is cleared of loose objects, FOD, snow and ice, inflammable substances etc.
c) Necessary personnel are trained, competent and present and at a state of readiness.
d) The helideck crew has been briefed on any special conditions prior to the arrival of the helicopter, especially on the arrival of unfamiliar types of helicopter or in the event of special operations.
e) All helideck associated equipment is place and in full working order.
f) All crane operations in the vicinity of the landing area have been stopped and the cranes are correctly positioned in relationship to the free approach and departure sectors and unmanned.
g) Passengers are held in the passenger waiting area during landing/take off and that they are under positive control by the helideck team during disembarkation and embarkation.
h) Passengers are correctly wearing appropriate clothing for offshore transport and safety devices which may include survival suits, life vests and Emergency Breathing Systems (EBS) where applicable.
i) Passengers have fastened their safety belts/shoulder harnesses and are seated in an appropriate seat for individual egress purposes.
j) Helicopter doors and latches are closed prior to departure.
k) Tie-downs and chocks are removed prior to departure.
l) An accurate manifest is provided to the flight crew (including actual passenger weights, cargo and baggage weights and potential Dangerous Goods/Hazardous Materials declarations).

Before landing the HLO shall maintain contact with the helicopter pilot and inform whether the deck is safe for landing ("Green Deck").

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

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

Conduct monthly helideck (emergency response) training scenarios with the helideck team (see13.6) and respond to emergencies using the checklists provided at 13.5(or equivalent) as a template to develop individual site-specific checklists.

9.1.2 Helideck Assistant (HDA) Responsibilities

The HDA supports HLO with:

a) Review of helideck hazards.
b) Pre-helicopter arrival checks.
c) Passenger handling and escort (Pax control).
d) Baggage/cargo loading/unloading.
e) Loading/unloading of survival equipment.
f) Helideck emergency response operations, as defined in the installation emergency response plan in the HOM.
g) Helicopter refueling (if used).
h) Chocks wheeled helicopters.

9.1.3 Fire Guard (FG)

a) Ensures firefighting equipment is operational and ready for helicopter operations
b) Maintains a position of readiness to respond in the event of helicopter mishap.
c) Mans the portable CO_2 fire extinguisher during refueling operations behind the refueler.
d) Mans the portable CO_2 fire extinguisher with long lance during on the helideck during helicopter engine start.

9.2 Flight Crew Responsibilities

When offloading or loading passengers with the rotors turning, the pilot at the controls shall guard the flight controls and engage in essential cockpit duties only. Not included in essential cockpit duties are the following: manifesting, weight and balance calculations or customer paperwork. Primary attention will be given to the aircraft controls and identification of hazards and passenger movement in the vicinity of the aircraft.

Where a flight crew consists of more than one pilot, one crewmember can supervise the unloading/loading process from outside the aircraft and check the doors and latches to be closed after the unloading/loading process prior to re-entering the helicopter. The pilot departing/climbing into the helicopter will communicate intentions with the HLO (if a manned facility) prior to departing/climbing into the helicopter to reduce risk in the event of control movement.

For single-piloted helicopters landing to a helideck with no HLOs, the helicopter shall be equipped with a loud hailer (external speaker) to assist with passenger control and the pilot will (where possible) land in a position that allows positive eye contact with the passengers as they approach/depart the helicopter.

9.3 Procedures for Landing and Post Landing of Helicopters

Prior to arrival of the helicopter			
Aircrew makes an initial call to the facility 20 minutes out and receives the helideck status.			
HLO		**HDA and FG**	
1	Verify the arrival time of the helicopter 30 minutes before the estimated time of arrival.	**1**	Meet with HLO at least 20 minutes before arrival time.
2	Meet with helideck team at the helideck at least 20 minutes before arrival	**2**	Prepare the cargo that is to be sent.
3	Verify that any stand-by vessel close by is informed of the arrival of the helicopter, and that no vessel is located within 500 meters in the 180 degree zone, or if higher than the helideck, in the 210 degree zone.	**3**	Check and prepare fire-fighting equipment.
4	During the 20-minute call, from the aircrew, inform the Helicopter of any vessels within 1000 meters. Gather information on the arriving helicopter. This includes: estimated time of arrival, location and amount of cargo, number of passengers and any fuel requirements. In difficult weather conditions/special cargo, evaluate the need for, and requisition, extra personnel.	**4**	Receive the manifest and information on number of arriving and departing passengers.
5	Make sure that the daily inspection of the helideck and refueling plant has been completed with a satisfactory result.	**5**	Don the necessary clothing and portable VHF
6	Check that the helicopter landing area is clear of obstacles.		
7	Brief and, if necessary, allocate tasks to the HDA and the Fireguard.		
8	Verify that the facility radio room is manned and that communications are operational		

Table 20: Procedures for Landing and Post Landing of Helicopters – Prior to arrival of helicopter

5 minutes prior to arrival of helicopter					
At 5 minutes before landing the pilot will confirm the flight is 5 minutes out and will receive an update from the facility regarding the weather and helideck status.					
HLO		**HDA**		**FG**	
1	Make sure that the crane drivers are informed.	**1**	Stand in a safe position in visual contact with the HLO	**1**	Make sure that the fire monitors are aimed and adjusted.
2	Monitor radio communication between the helicopter pilot and the installation				
3	Make sure that the passengers are ready and remain in a safe zone without access to the helideck. Physical barriers shall be used.				
4	During the 5-Minute aircrew call provide updates to helideck status and weather information				

Table 21: Procedures for Landing and Post Landing of Helicopters - 5 minutes prior to arrival

Immediately prior to the helicopter landing, and during landing					
Just prior to landing a "green deck" call is made by the aircrew.					
Note 1: If the pilot makes a call before the HLO has the aircraft in sight, the HLO should relay "Stand by until I have aircraft in sight" and shall NOT provide a "Green Deck". **Note 2:** The "Green Deck" provides the pilot with the assurance that the helideck is considered prepared, ready and safe for helicopter arrival. The HLO will also switch off the Helideck Status Lights which is a visual confirmation to the pilot that the deck is 'Green' and that he is approaching the right helideck. With the "Green Deck" information, the pilot can now proceed with his additional assessments for landing.					
HLO		**HDA**		**FG**	
1	Make sure that cranes have stopped operating. Peripheral crane operations may be permitted but the pilot must be informed.	**1**	Stand in a safe position in visual contact with the HLO	**1**	Stand at the upwind fire post or alternatively at the remote control unit. Stand at full readiness with the switch for the alarm systems within reach.
2	During the 'Green Deck' call, to the aircrew, notify the pilot on VHF that he has a "Green Deck" (helideck is prepared and safe for landing) when the HLO has the aircraft in sight with landing gear down (if equipped) and give warning of sea spray if this has been observed on/over the helideck. In especially				

Immediately prior to the helicopter landing, and during landing			
Just prior to landing a "green deck" call is made by the aircrew. **Note 1:** If the pilot makes a call before the HLO has the aircraft in sight, the HLO should relay "Stand by until I have aircraft in sight" and shall NOT provide a "Green Deck". **Note 2:** The "Green Deck" provides the pilot with the assurance that the helideck is considered prepared, ready and safe for helicopter arrival. The HLO will also switch off the Helideck Status Lights which is a visual confirmation to the pilot that the deck is 'Green' and that he is approaching the right helideck. With the "Green Deck" information, the pilot can now proceed with his additional assessments for landing.			
	HLO	**HDA**	**FG**
	difficult weather conditions ask the pilot to notify the passengers. **Note:** If the pilot makes a call before the HLO has the aircraft in sight, the HLO should relay "Continue until I have aircraft in sight" and shall NOT provide a "Green Deck"		
3	Take up a safe position by the most suitable stairway, primarily on the upwind side, with a view over the helideck and continued visibility of the aircraft in order to be able to recognize anomalies,		
4	Turn OFF the Helideck Status light(s)		
5	Monitor and direct helideck activities maintaining communications with flight crew, helideck team and facility radio room.		
6	Continuously monitor and immediately report any abnormal situation		
Note 1: It is the helicopter operator's responsibility to ensure they have procedures in place requiring proper identification of the helideck and communications with the facility prior to landing and that pilots are routinely checked on the knowledge of these procedures. **Note 2:** It is a best practice to also confirm the helicopter landing gear being down during the 'Green Deck' call to avoid an attempted landing with the gear up.			

Table 22: Procedures for Landing and Post Landing of Helicopters - Immediately prior to the helicopter landing, and during landing

After landing					
HLO		**HDA**		**FG**	
1	After the pilot has communicated it is safe to approach the aircraft, the HLO signals to the HDA that entry to the helideck is now allowed.	**1**	On receiving a signal from the HLO take wheel chocks and place these in position (both sides shall have chocks)	**1**	Serve at the fire post until the chocks are in place on both sides.
2	Can take a set of wheel chocks and place these in position, and receive/deliver the manifest from/to the pilot	**2**	HDA unloads passenger baggage after landing.	**2**	When turnaround is conducted with rotors running, FG remains at the fire post. If rotors are not turning the FG can assist in turnaround as HDA, if trained and competent.
3	Within the safe zone for the rotor, take up a supervisory position that ensures eye contact with the pilot and a full view of the helideck.	**3**	HDA opens passenger door.		
4	Passengers off-loaded and pick-up baggage and control passenger movement.	**4**	HDAs observe/direct passenger movement.		
5	Monitor and direct helideck activities maintaining communications with flight crew, helideck team and facility radio room.				

Table 23: Procedures for Landing and Post Landing of Helicopters - After landing

9.4 Procedures for Helicopter Turnaround

Preparation for Helicopter shutdown/start up					
From: The helicopter is on the deck; the passengers have left both the helicopter and the helideck					
To: The rotor has stopped and the pilot has communicated it is safe to approach the aircraft					
HLO		**HDA**		**FG**	
1	Stand in the safe zone with a full view of the helideck and with the wind at his back.	**1**	Stand in the safe zone by the access stairs.	**1**	Maintain fire watch
2	Monitor and direct helideck activities maintaining communications with flight crew, helideck team and facility radio room.				

Table 24: Procedures for Helicopter Turnaround - Preparation for helicopter shutdown/start up

Shutdown					
HLO		**HDA**		**FG**	
1	When the rotor has stopped, the HLO will establish positive communications with the pilot.	**1**	When requested by the HLO, assist in tying down the rotor blades and securing the helicopter.	**1**	When requested by the HLO, assist in tying down the rotor blades and securing the helicopter.
2	The HLO will get help to tie down the rotor blades and secure the helicopter as required.				
3	Monitor and direct helideck activities maintaining communications with flight crew, helideck team and facility radio room.				

Table 25: Procedures for Helicopter Turnaround – Shutdown

Preparation for start					
From: The helicopter is on the deck with the pilots onboard					
To: The helicopter has both engines running, the rotor turning, the pilot has communicated the helicopter is ready to take onboard both passengers and cargo.					
HLO		**HDA**		**FG**	
1	Keep eye contact with the pilot and maintain full view of the helideck.	**1**	Keep eye contact with the pilot and maintain full view of the helideck.	**1**	The fireguard stands beside the relevant fire post/remote control unit wearing all fire protection gear
2	During start up there should be no passengers onboard the helicopter, unless the pilot advises accordingly.			**2**	Get the portable CO_2 fire extinguisher that is equipped with the long lance and prepare for engine startup.
3	Monitor and direct helideck activities maintaining communications with flight crew, helideck team and facility radio room.				

Table 26: Procedures for Helicopter Turnaround - Preparation for start

Start engines					
HLO		**HDA**		**FG**	
1	Stand in front of the helicopter in the safe zone	**1**	Assist fireguard whenever necessary as directed by HLO.	**1**	Take up position on the indicated side of the helicopter with the CO_2 extinguisher with long lance to observe the engine startup. (When moving, after no.1 engine has started and the rotors are turning, the fireguard must stay outside the rotor disk when proceeding to the next engine, avoiding the risk of decapitation by blade movement.)
2	Monitor and direct helideck activities maintaining communications with flight crew, helideck team and facility radio room.			**2**	In the event of a fire in or under the helicopter, alert the pilot/HLO by the portable VHF radio, or by giving the signal "Shut down".
				3	Start to extinguish the fire.

Table 27: Procedures for Helicopter Turnaround - Start engines

Final stage of start-up, embarking passengers and loading/take off without passengers					
HLO		**HDA**		**FG**	
1	On the signal from the pilot, after engine start, commence boarding passengers and loading cargo, remove chocks	**1**	Take up position and give sign to the HLO that boarding is ready to begin.	**1**	Proceeds to the access stairs to await signal from HLO regarding boarding the passengers
2	When the HDA is ready, the HLO will give the signal to the HDA that boarding can start.	**2**	HDA loads passenger baggage after loading passengers.		
3	Stand in front of the helicopter in the safe zone located to be able to observe the boarding process.				
4	Monitor and direct helideck activities maintaining communications with flight crew, helideck team and facility radio room.				

Table 28: Procedures for Helicopter Turnaround - Final stage of start-up, embarking passengers and loading/take off without passengers

9.5 Procedures for Departing Helicopters

Departing Helicopters					
HLO		**HDA**		**FG**	
1	Signal to the HDA to remove the chocks on the left hand side. Remove the chocks on the right hand side.	**1**	At the signal from the HLO, remove the chocks from the left hand side.	**1**	Don full fire protective clothing.
2	When the helideck is clear and the fireguard is in position, give a "thumbs up" hand signal to the pilots or communicate "Helideck is clear" by radio to pilots.	**2**	Do not leave position until two minutes after takeoff. Listen on VHF in the event of a possible return of the helicopter to the installation.	**2**	Take up position at upwind fire post, alternatively at the remote control unit.
3	Monitor the take off and radio communication, and immediately report any abnormal situation	**3**	Maintain state of readiness as directed by the HLO.	**3**	Do not leave position until two minutes after takeoff; listen on VHF in the event of a possible return of the helicopter to the installation.
4	Make sure that no helideck team member leaves their position until 2 minutes after take-off. Make sure that everyone remains in readiness for another 5 minutes for potential return to the helideck due to problems, or until the helicopter has landed at another installation.			**4**	Maintain state of readiness as directed by HLO.
5	Turn ON the helideck status light(s) to indicate the helideck is not prepared to receive helicopters.				

Table 29: Procedures for Departing Helicopters

9.6 Procedures for Refueling

Refueling with Rotors Turning					
Refueling with passengers onboard is acceptable provided a mutual agreement between the pilot and the HLO, and shall take into account the prerequisites as described in paragraph 7.8.1 for HRR are followed in addition to standard procedures as described in this enclosure.					
HLO		**HDA**		**FG**	
1	Remains in position with a full view of the helideck.	**1**	Waits until all passengers have left the helideck and then provides fuel sample from refueling cabinet up to the pilot for approval	**1**	Pulls out bonding cable and grounds the helicopter as prescribed in the Flight Manual for the helicopter.
2	Monitor and direct refueling activities maintaining communications with flight crew, helideck team and facility radio room.	**2**	Upon approval of the fuel sample, returns the sample to the refueling cabinet and pulls out the fuel hose. When the Fireguard has connected the earthing cable, the HDA will earth and connect the fuel hose to the helicopter and open the connector valve.	**2**	Take up position behind refueling HDA). With portable powder extinguisher within reach.
					Note: In certain cases (e.g. AW139) the Fireguard will have to spot the refueler when the refueler steps unto the aircraft sponson to commence fueling.
3	Verify that the fuel system grounding light is ON, the counter is set to zero, and that the fuel hose is connected to the helicopter.	**3**	Stays in position at helicopter refueling point.	**3**	On the signal from the pilot the fireguard will signal to the HLO that fueling can commence.
4	Signal to the HDA near the fuel cabinet to push the button to start refueling.	**4**	An additional HDA will need to man the fuel pump emergency shut-off switch near the refueling		
5	Maintain monitoring and directing refueling activities maintaining communications with flight crew, helideck team and facility radio room until refueling complete.				

Table 30: Procedures for refueling with rotors turning

9.7 Helideck Team Personal Protective Equipment (PPE) and Supporting Equipment

1) Helideck Team Vests: The helideck crew members shall be readily identifiable to the helicopter crew and passengers as the persons in charge of operations. The preferred method of identification is a bright (color contrasting to the firefighting coveralls) vest or jacket with the word "HLO", "HDA" or "FG" as appropriate stenciled on the front and back of the vest or jacket. Vests shall be high visibility fire retardant materials.
2) Helmet with Visor (optional), but safety glasses with side shields as minimum.
3) Hearing Protection, with headsets wired into the communications radios.
4) Gloves, fire retardant, oil resistant.
5) Boots, fire retardant and safety toe compliant, oil resistant.
6) Fire retardant clothing or coveralls.
7) Communications, aviation VHF radio wired into the helideck crew headsets.
8) Light Wands for Hand Signals at Night (see 9.9.2).

Note: Due to static electricity and melding in flames, nylon clothing shall not be worn by helideck personnel.

9.8 Clear Deck Policy

Offshore helidecks are to be clear of all cargo and passengers that are being off-loaded prior to passengers or cargo coming onto helideck/heliport to board the helicopter.

9.9 Light and Hand Signals

Below are references to hand and light signals that are used for helideck operations by the helideck and flight crew.

9.9.1 HLO Hand Signals (Day and Night)

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.

9.9.2 HLO Hand Held Light Signals

Hand held lights with colored filters below 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".

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

Table 31: HLO Hand Held Light Signals

9.9.3 Helideck Status Lights

Helideck status lights at manned facilities are used to indicate when the helideck is considered an 'unsafe landing area' (helideck status light "on") and when helideck is considered safe for helideck operations (helideck status light "off"). See 7.5.1.5, 8.8.1, 8.12 and 8.13.

9.10 Use of wheel chocks

This procedure applies to all helicopters with wheeled undercarriages. Wheel chocks shall be made from rubber or sand bags shall be used. Wooden wheel chocks are not acceptable as historical events have shown that they can splinter and break apart under pressure creating a hazard that can be avoided by using rubber chocks or sand bags.

Note: When landing nets are used, chocks shall be made from sandbags to assure adequate contact area for friction.

Standard hand signals must be used per ICAO Annex 2.

The wheel chocks must immediately be put in place as soon as the pilot has communicated it is safe to approach the aircraft. The wheel chocks must be placed in front of and behind both main wheels.

Both pilots must remain in the cockpit until the wheel chocks are in place.

Once the chocks are in place and the rotor remains in motion, one pilot will always remain guarding the flight controls and not distracted doing paperwork, etc.

The wheel chocks are removed when both pilots have taken their respective seats, and the pilot has signaled, "Remove wheel chocks".

9.11 High Winds or Adverse Weather

In high winds (above 40 knots) or other adverse weather conditions (see details on adverse weather criteria at 8.15.1), it may be necessary to have additional passenger and handling procedures in place for passenger movements.

9.12 Passenger and Cargo Management

9.12.1 Passenger Helideck Access and Egress

The location of access and egress stairways (or emergency ladders) shall meet the requirements of RP Nbrs: 161 paragraph 4.5 and 162 paragraph 3.7. The helideck should be accessible from at least two points, positioned as far as practically possible from each other. Access is to be limited to one "operational" access point with the other access point having access blocked by a frangible chain or hinged gate with a sign stating "No Access During Helicopter Operations" or equivalent (see sample sign below).

Note 1: Signage and visual aids should be visible, clean, and in working order to direct passengers and personal to safe transition areas and muster points, if needed

Note 2: The drainage system/gutter in front of all normal and emergency access points and any other access to the helideck (e.g., from firefighting landings) shall have anti-trip mesh grating to cover the top of the gutter.

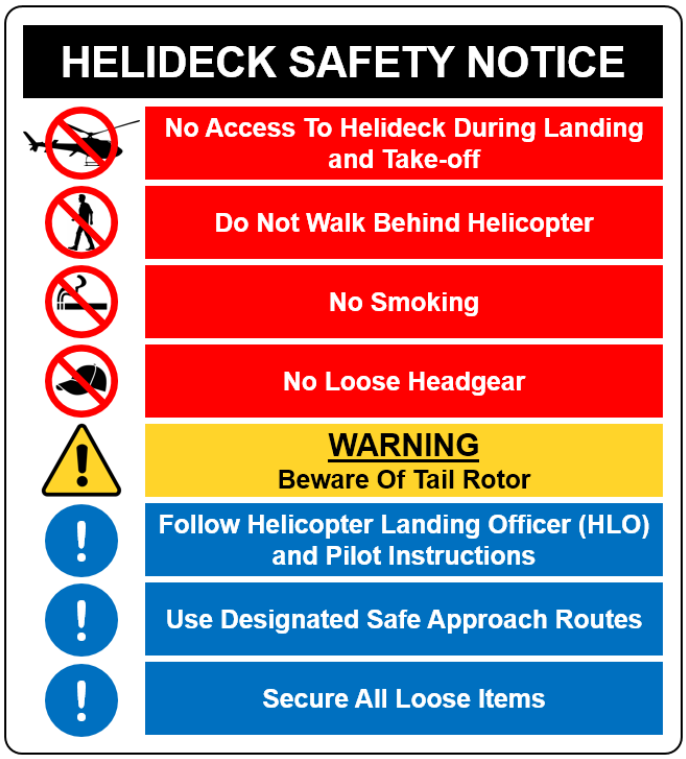


Figure 10: Sample Helideck Entrance Poster

Stairs and Stairwells shall be clear of debris and have a nonskid surface. The stairs shall be unobstructed for clear egress and ingress to the helideck. Hand rails shall be provided to maintain three points of contact while using the stairs. Hands rails shall be collapsible/foldable to not present a hazard in collapsed state with a maximum height of 2 inches (5cm) above the TLOF surface. Hand rails shall be painted in conspicuous colors (preferably black and yellow hash marks) and when collapsed or folded should not cover the stairs impeding emergency use of the stairs...

> **Note:** It may not be possible to provide two access/egress routes for helidecks mounted on top of minimum structures and may have to be limited to one, in which case this shall be documented in the HIP as a limitation in the facility operational procedures.

The TLOF surface shall have the word "EXIT" as specified in HSAC RPs 161 and 162 in 6 inch white letters with a red background painted at the stairwell opening.

9.12.2 Emergency Exits

a) Emergency handrails shall not exceed the height limits specified in 7.3.4 above the helideck level.
b) Vertical emergency exits normally open to the helideck shall be covered with a lightweight grating to prevent inadvertent fall injuries.
c) Exits that provide egress by ladder shall be marked as "EMERGENCY EXIT" as noted above.
d) Exposed vertical emergency exit "ladders" shall be fully enclosed by a "cage" that will prevent personnel from falling through.

9.12.3 Passenger Waiting Area

Helidecks shall have a designated and protected passenger waiting area, which is clear of the helideck, access points, and stairways.

The protected passenger waiting area shall be at a minimum of 7 ft. (2.0m) below the elevation of the helideck surface, away from any refueling equipment and fire firefighting access facilities (HSAC RP 161 paragraph 5.4 and 162 paragraph 3.7).

A poster indicating the safe areas that passengers must use when leaving or approaching the helicopter shall be placed in a prominent position on the facility (see sample below), in dual language if required. The subjects covered shall be representative of the helicopters to be used and shall include, but not be limited to, the following:

a) Tail and main rotor clearances and danger zones
b) Approved approach directions
c) Emergency Exits

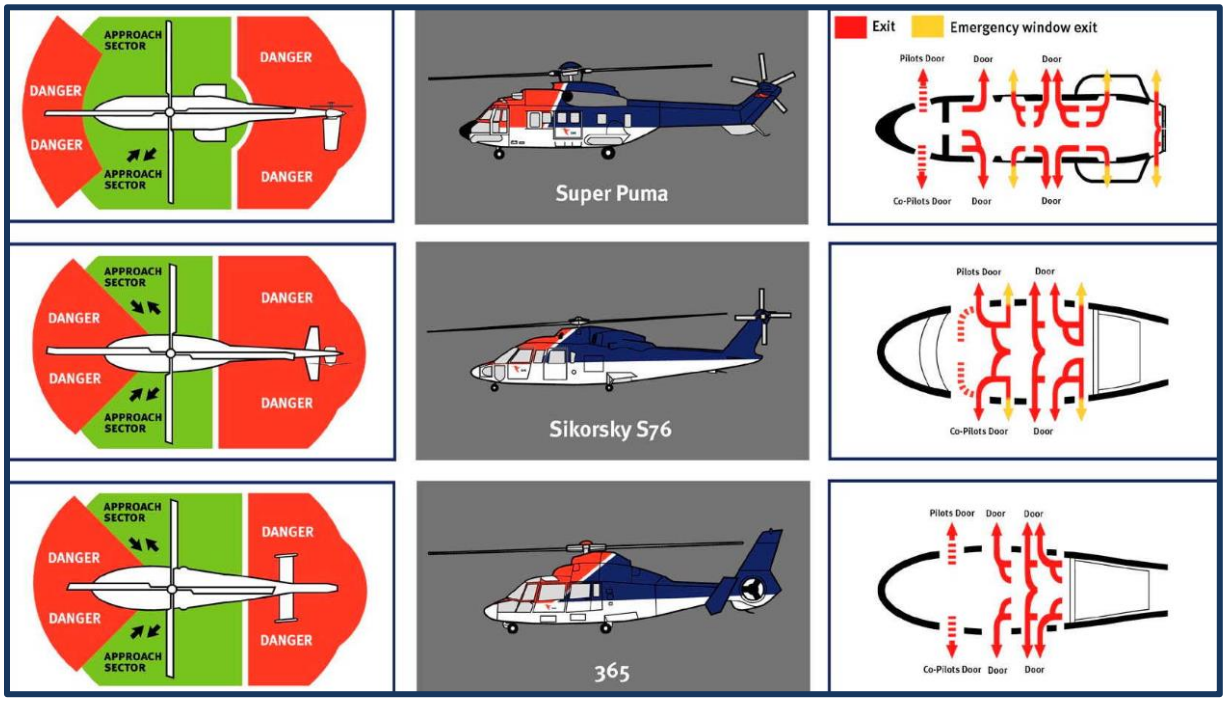


Figure 11: Sample of Safe Areas for Approaching a Helicopter and Emergency Exits

Note: The designated area may also serve as a viewing room for video safety briefings and provide an area to weigh and manifest all outgoing passengers, baggage and freight on calibrated scales. This area may also be used for changing into/from survival suits if worn, in order to minimize turnaround time.

9.12.4 Passenger Manifests

9.12.4.1 Information to be recorded

A passenger manifest shall be raised for each flight to/from the helideck and shall have the following minimum information recorded: name of each passenger, passenger's company affiliation, actual passenger weight and that of personal baggage, the aircraft registration, and the weight of cargo. If Dangerous Goods/Hazardous Materials

are to be transported, the proper documentation also needs to be provided along with the passenger manifest. A computer-based manifesting system may be used, provided the pilot can be given the current information.

Note 1: Actual body weights verified with a heavy-duty calibrated scale (including hand carried baggage) shall be used. Previously collected (prior night) weights and declared weights shall not be used on flight manifests. Manifested passenger and baggage weights may be subject to random post-flight checks when returning from offshore to re-assure offshore weighing procedures are precise.

Note 2: If items other than hats, mobile phones, or small electronic devices are added to the baggage after it is weighed, the baggage shall be reweighed. Segregation of baggage from the passenger after weigh-in is a best practice to avoid weight differences between weigh-in and flight.

Note 3: For flights originating offshore, a designated offshore individual shall ensure that accurate manifests are provided to pilots.

9.12.4.2 Additional Information

The form may also include a charge allocation and flight number if applicable.

9.12.4.3 Manifest Changes/Additions.

If additions or deletions occur, the manifest will be revised to accurately reflect the names of the persons on board and passenger, baggage and cargo weights.

9.12.4.4 Retention

A copy of the manifest shall be retained on the facility or relayed to a responsible party, prior to departure of the helicopter, with instructions to retain it until the trip is completed.

9.12.4.5 Passenger Verification

Pilots and/or designated personnel shall check the actual passenger names using photo identification versus the preplanned listing of personnel to be transported to verify only authorized passengers are carried. In addition, passenger HUET training status shall be verified to assure the passenger is current and able to egress a ditching helicopter safely.

9.12.5 Passenger Briefings

Helicopter Operators have a responsibility to brief passengers prior to every flight and this may be achieved onboard the aircraft and may abbreviated if supplemented by video briefings in the appropriate language(s) at the facility (if available/required by the individual company). This will require the availability of a VCR/DVD or other electronic media player on the facility.

Passenger Briefing Contents	
The passenger briefings that would normally be conducted for onshore operations shall be amended to include the items below:	
1	Passengers shall be advised to be aware of wind and helideck conditions, as the helideck might be slippery or have a trip hazard if equipped with a landing net.
2	If an item is blown away by the wind, do not chase it.
3	When asked to carry baggage to the helicopter, do not open baggage on the flight line or helideck.
4	Hand baggage to the HLO/Pilot or the HDA standing or place it in the designated position on the helideck before entering the helicopter cabin.

Passenger Briefing Contents		
The passenger briefings that would normally be conducted for onshore operations shall be amended to include the items below:		
5	Passengers who have completed helicopter underwater escape training (HUET) shall sit adjacent to emergency exits/egress windows and, if possible, assist non-HUET trained passengers that may only occupy a seat next to a HUET-trained passenger in the event of a ditching.	
6	If survival suits are worn, passengers shall have suits FULLY zipped with hood on (if equipped with integral hood) during take-off and landing over water, when flying below 500 feet over water, and as advised by the Pilot-In-Command.	
7	Passengers shall be advised that in the event of an emergency landing on the water, the helicopter should not be evacuated until rotor movement has stopped, unless instructed otherwise by the Pilot-In-Command.	
8	Passengers shall be told not to inflate life vests until they are outside the helicopter.	
9	Passengers shall be familiar with and know the location of emergency equipment such as life rafts, and know how to jettison the emergency exits, pop out windows, and deploy the life rafts outside the helicopter.	
10	Carriage of loose articles in the aircraft that could present risk of Foreign Object Damage (FOD) or impede egress in the event of ditching (such as newspapers) shall be discouraged.	
11	Description of the crash brace position. The briefings must include passenger hand functions that are important to reduce risk, especially after the helicopter lands in the water and it begins to rollover. In this situation the proper brace position must be maintained until the rollover motion has stopped.	
	a	Passengers shall be briefed on the proper use of reference points for orientation during the event of a rollover ditching.
	b	If an Emergency Breathing System (EBS) is not in use, the hand opposite the exit should firmly hold the seat edge as a reference point while the hand nearest the exit is used to remove the emergency exit. Once the exit is removed, firmly grab the window frame with the hand nearest; the hand opposite the window should then be used to release the harness and assist in exit.
	c	If EBS is in use, helicopter Operators shall review briefings and briefing cards to ensure instructions are clear and aligned with safe evacuation objectives. It may be necessary, depending on the type of EBS employed, to release both hands from the brace position to activate the EBS. Then use the hand opposite the exit to reestablish the hold on the seat edge as a reference and continue the exit process described above.

Table 32: Passenger Briefing Contents

9.12.6 Baggage and Cargo Handling

Access to the helideck for handling materials or equipment transported by the helicopter must be assessed from a safety perspective. This in many cases may be limited to steep stairways or ladders.

Weighing and Documentation: Helicopter Operators will verify the contents of each piece of cargo offered for transport by air. This task may also be performed by competent offshore facility personnel previously approved by the helicopter operator to perform these duties. All cargo will be weighed separately and manifest provided to the pilot.

Note: All aspects of dangerous goods shipping, packaging, acceptance, and handling shall be completed by appropriately competent personnel (see section 12).

9.12.7 Hazardous Materials (Dangerous Goods)

9.12.7.1 Passenger Flights

Most hazardous materials are prohibited onboard passenger flights. Included in this list are some explosives, flammable fluids and gases, chemicals, and radioactive materials.

9.12.7.2 Minimum Requirements

Helicopter Operators shall provide pilots with guidance regarding all aspects of transporting dangerous goods by air. These instructions shall not be contrary to the pertinent regulatory documents. Where regulatory guidance is lacking, the book 'Dangerous Goods Regulations', published by the International Air Transport Association is an acceptable substitute.

9.12.7.3 Responsibilities

Packaging, labelling and preparation of the Dangerous Goods Declaration form are the responsibility of the shipper, not the aircraft Operators'.

9.12.7.4 Packaging

If DG is accepted for air transport, it is limited to approved quantities/volumes, have packaging and labeling requirements and must be certified as suitable.

9.12.7.5 Documentation

If hazardous materials are carried, the Pilot-In-Command shall be provided with a 'Shippers Declaration of Dangerous Goods' form or locally regulator approved equivalent form and comply with the Operator's Operations Manual.

9.12.8 Fitness to Fly

Offshore passengers who determine that they might not be fit to fly shall notify the facility owner or offshore medic as soon as possible who shall inform the helicopter operator prior to finalizing the flight manifest. Medical protocol applicability will be assessed with the helicopter Operator, and if the passenger is deemed unfit, alternative transportation will be arranged as needed.

In addition, at the time of the flight a passenger seated adjacent to an exit window/door must have sufficient mobility, strength or dexterity in both arms, hands, and both legs to:

a) Reach upward, sideways, and downward to the location of the emergency exit.
b) Grasp and push, pull, turn, or otherwise manipulate mechanisms.
c) Push, shove, pull, or otherwise open the emergency exit window/door without assistance.
d) A passenger seated in a seat adjacent to an exit window/door must have the ability to read and understand instructions related to emergency evacuation provided by the air operator in printed or graphic form.

9.13 Helideck Systems and Equipment

The following shall normally be provided for safe and efficient operations:

a) Lighting for night/IFR operations
b) Refueling system (optional) see paragraph 5.3, 10.7.
c) Firefighting equipment see section 11.
d) Compressed air and fresh water if maintenance is to be performed at the helideck.

e) Tie-down ropes/straps. Minimum of 4; breaking strength of 12,000 lbs.) with the manufacturer's load capability attached.
f) Windsock.
g) Wheel chocks, rubber or sand bag, see 9.13
h) Helicopter start unit (optional)
i) Weather equipment at manned facilities
j) Communications at manned facilities
k) Helicopter towing/ground handling equipment (optional) for moving aircraft that may be down for maintenance, etc to another location on the helideck or into a parking area. This equipment shall be accepted by the helicopter Operator prior to use.
l) Hand held signal lights with clear, red, and green filters

9.14 Emergency Response

See Section 13.

10 HELIDECK AND ASSOCIATED SYSTEMS MAINTENANCE

10.1 General

10.1.1 Maintenance Activities

Maintenance activities are considered to be all the activities required or undertaken to preserve as closely, and as long, as possible the original condition of a helideck and its associated systems while compensating for normal wear and tear. Included in maintenance activities are the following:

a) Inspections.
b) Preventive Maintenance
c) Corrective Maintenance.
d) Modifications and upgrades.

10.1.2 Maintenance Requirements

The maintenance requirements for helidecks and the associated systems are detailed in APPENDIX 3 – Helideck and Associated System Maintenance, Inspection and Helideck Daily Status Reports, APPENDIX 4 - Fuel System Design, Maintenance and Inspection Requirements, and APPENDIX 5 – Fire Fighting System Maintenance Requirements.

10.2 Helideck Inspections

10.2.1 General

On prescribed intervals the helideck and associated systems shall be inspected for proper condition and conforming to the applicable/known requirements and guidelines and standards. This will be accomplished by using series of evaluations/appraisals involving visual checks, measurements and tests against a pre-determined set of criteria. See Checklists in APPENDIX 3: Attachment 2 – Helideck Daily Inspection Checklist, Attachment 3 – Helideck Monthly Inspection Checklist, and Attachment 4 – Helideck Initial or Annual Inspection Checklist.

The sections below provide the minimal intervals and criteria for inspections of the helideck and associated systems.

10.2.2 Daily Helideck Inspections

A Daily Helideck Inspection is to assure operational readiness and will be completed for manned facilities by a Helicopter Landing Officer (HLO) and recorded.

> **Note:** In the case of unmanned facilities, the daily inspection might not be possible prior to operations. Lacking a daily inspection, the pilot shall ensure by aerial assessment the suitability of the landing area before commencing the landing.

10.2.3 Monthly Helideck Inspections

A Monthly Helideck Inspection by an HLO will be completed and recorded for manned facilities. The monthly inspection checklist is more comprehensive than the daily inspection checklist and includes a review of the overall condition of the helideck and the supporting equipment, fire and rescue equipment, condition of the friction of the deck, paint condition, and ongoing maintenance of complex systems such as fuel- and firefighting system.

> **Note:** In the case of unmanned facilities the monthly inspection frequency may be extended to; however shall not exceed a six month interval (bi-annual).

10.2.4 Initial and Annual Helideck Inspections

All helidecks shall undergo a formal initial helideck inspection or commissioning inspection (new build, new facility ownership/operator, rebuild, and relocation of facility to a new regulatory environment, etc.). After commissioning, an annual helideck inspection cycle shall be implemented by the facility owner or the helicopter operator.

10.2.5 Helideck Associated Systems Inspections

Helideck personnel shall be familiar with the maintenance schedule of all associated systems and supporting equipment used in conjunction with helideck activities.

Many supporting pieces of equipment require either "On Condition" maintenance or maintenance and inspection schedule intervals that are different than those defined above and may be defined by the manufacturer.

The manufacturer maintenance recommendations shall be followed. See Sections 10.7 and 11 for details on fuel and firefighting system maintenance and inspection.

10.2.6 Checklists

All checklists referenced in this RP are located in the APPENDICES. As a minimum, the inspection requirements specified in the HSAC RP checklists must be met. However, different checklists that meet or exceed these requirements are also acceptable for use.

These checklists include inspection items regarding the surrounding area below and around the helideck to mitigate the potential hazards that may be present during helicopter operations and have been added to the environment since last inspection. For example the effects of wind generated by downdraft or obstacles that may have been added since the previous inspection.

10.2.7 Helideck Inspection Discrepancies and/or Other Non-Conformities

Any discrepancies reported during the inspections will be tracked to closure by the facility owner, and this shall be documented and records, including evidence of close-out, shall be retained (see 10.2.8).

All the above mentioned discrepancies shall be communicated to the helicopter operators expediently to ensure continued safe operations.

Immediate flight safety concerns like the infringement of the TLOF, OFS/OFDS or LOS need to be communicated by email or telephone as soon as possible and reviewed for potential limitations for flight operations to the helideck.

The facility HIP (see HSAC RP 164) shall be updated with all limitations/non-conformities that are permanent or long term in nature.

As discrepancies are resolved, the owner ensures that the operators are updated and a new HIP with the relevant changes is issued.

10.2.8 Documentation

All inspections, including daily, shall be documented and discrepancies tracked to closure, and records including evidence of close-out retained for a minimum of two years.

10.2.9 Helideck Inspector Training

All helideck inspections shall be completed by properly qualified (see Section 12) personnel and documented with records retained for a period of two years.

Helideck and fuel system inspector training shall be documented (see Section 12).

10.3 Preventive Maintenance

10.3.1 General

All helidecks and associated systems are subject to wear and tear caused over time by, amongst others, normal use, incorrect use, incidents and/or by environmental conditions.

The outcome of inspections (mostly visual) can serve as a good basis to identify possible future maintenance requirements on the helideck and associated systems; helideck preventive maintenance is the series of activities (more physical actions) trying to prevent or minimize the impact of wear and tear on the operational availability of the helideck and associated systems.

The series of preventive maintenance activities can be categorized as follows:

a) Cleaning
b) Testing
c) Replacing, replenishing

For each facility a specific maintenance manual will be in place depending on local site conditions, equipment and use. As a minimum, HSAC has determined in APPENDIX 3, Attachment 1 – Helideck and Associated System Maintenance Requirements of this document a list of minimal requirements and suggested intervals for maintenance activities regarding helideck and associated systems. This is to be complemented with Specific OEM provided equipment maintenance instructions for each facility. This section provides guidance on the proper maintenance of the helideck and supporting systems

10.3.2 Preventive Maintenance (PM) interval and activities

In general, PM involves the following:

10.3.2.1 Cleaning

The helideck and associated systems shall be kept clean as part of good housekeeping. Depending on the asset, site location and environmental conditions, cleaning shall be done as a minimum once every three months, or as often as required

10.3.2.2 Testing

Each installed system supporting a helideck shall be functionally tested to assure correct working at least annually. This may overlap with inspection activities as per Chapter 5/6 in order to assure operational readiness.

10.3.2.3 Replacement & Replenishment (R&R)

This series of activities is required to preventively replace, replenish and or repair parts and fluids to ensure the correct working and cleanliness of the system and prevent unscheduled downtime.

Based on OEM maintenance instructions some parts may need to be replaced. A list of possible items is shown below:

a) Filters (fuel, water)
b) Gaskets (drain & firefighting piping)
c) Bulbs (light systems (if not LED), control panel pilot lights)
d) Fluids (oil for pumps, AFFF foam, extinguishing agent)
e) Bolts/fasteners
f) Paint marking
g) Conservation against corrosion
h) Safety and/or landing netting
i) Sealants (TLOF surface)
j) Crash equipment (inspection)

The helideck owner shall consider having spare parts readily available or have a process in place making these parts available onsite in time for R&R activities.

10.4 Corrective Maintenance

In case an element of the helideck and/or associated system is damaged or broken due to an unplanned event or incorrect operation, the owner shall repair and/or replace this unserviceable item. This activity is considered corrective maintenance. Exchange and repair is to be completed in accordance with OEM equipment maintenance and repair instructions as soon as possible.

The owner is to consider the impact of delaying any corrective maintenance for all helideck users and shall communicate delays in corrective maintenance to all helideck users accordingly.

10.5 Modifications and Upgrade

Over time it is possible that the helideck and or the associated systems may have to be modified or upgraded due to a number of potential factors including:

a) Change in regulations/standards
b) Change in use of the helideck
c) Change in helicopter type(s) used
d) Relocation of the asset
e) Change in topside layout
f) Improvement/outfacing of helideck and/or associated systems

These upgrades and modifications are to be completed in line with HSAC RP 161 or HSAC RP 162.

10.6 Helideck Documentation

10.6.1 Facility Maintenance Manual

Every manned facility shall have a manual prescribing maintenance requirements for the helideck and associated systems. This could be part of a Facility Maintenance Manual or Maintenance Management System. The helideck portion of this manual should as a minimum be based on the contents of this RP, national/international/association guidelines and the equipment manufacturer's maintenance instructions.

10.6.2 Helideck information Plates (HIP)

Because of the importance of maintaining up-to-date information about the often-changing environment offshore, the HIP information shall be reviewed and checked for accuracy following helideck inspections as prescribed by the procedures defined in RP Nbr: 164.

10.6.3 Safety Critical Equipment (SCE) Listing

Offshore facilities shall identify Safety Critical Equipment/Elements (SCE) serving as critical Controls and Recovery Measures for aviation hazards, and mitigate their degradation through the use of a document that identifies under what conditions with what serviceable equipment which helicopter operations and/or refueling operations are still permitted. This document can be part of the facility Manual/Matrix of Permitted Operations (MOPO) (see section 8.1), or equivalent document.

Facilities shall analyze the Equipment/Elements in the table at APPENDIX 1 – Sample SAFETY CRITICAL EQUIPMENT (SCE) Listing for designation as Safety Critical Equipment/Elements and inclusion in the facility document mentioned before in the impaired systems section, as well as include the identified SCE in the facility maintenance management system to ensure the completion of required preventive maintenance and periodic inspections. See definitions section for Controls and Recovery Measures.

10.7 Fuel System Design, Maintenance and Inspection

10.7.1 Design Requirements

For fuel system design requirements, see APPENDIX 4, Attachment 1 – Fuel System Design.

10.7.2 Maintenance Requirements

For fuel system maintenance requirements, see the Maintenance Requirements Listing APPENDIX 4 Attachment 2 – Fuel System Maintenance Requirements.

10.7.3 Fuel System Inspection – General

All inspections, including daily, monthly, bi-annual, and annual shall be documented (see Checklists located at APPENDIX 4 - Fuel System Design, Maintenance and Inspection Requirements), discrepancies tracked to closure, and records maintained for a minimum of two years.

Personnel performing fuel system inspections shall be properly trained (Section 12) and are usually part of helideck staff

10.7.4 Daily Fuel System Inspection:

The 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. Fuel samples to be tested shall be pulled from the following locations: fuel storage tank sumps, all filters/monitors, and fuel nozzle. In addition differential pressure readings shall be recorded on the daily checklist. When fuel quality issues are recorded or differential pressure reading exceeds 15psi, the fuel system shall not be used until corrective actions have remedied the underlying issue.

10.7.5 Monthly Fuel System Inspection

A Monthly Fuel System Inspection will be completed and recorded. These checks are more comprehensive than a daily inspection and include a review of the overall condition of the fuel system and supporting equipment, fire and rescue equipment, filtration, bonding/continuity, signage, meters, etc., and the ongoing maintenance status of the fuel system.

10.7.6 Six Monthly Fuel System Inspection

A Six Monthly Fuel System Inspection will be completed and recorded. These checks are more comprehensive than the monthly inspection and include Monthly inspection items plus a check of the emergency shutoff, strainers, and a review of the overall condition of the system and the supporting equipment, and the ongoing maintenance status of the system.

10.7.7 Initial and Annual Inspection

All fuel systems shall be formally inspected initially (new build, new facility ownership/operator, rebuild, and relocation of facility to a new regulatory environment, etc.) and commissioned, then inspected annually by a certified fuels inspector or the helicopter operator.

As part of this annual fuel system inspection, the interior of all tanks and tank seals will be inspected, all gauges/pressure relief valves are inspected and calibrated, fuel filters replaced (unless the manufacturer specifies differently) and all the activities mentioned above are to be documented..

Annual tanks inspections shall include a check for internal build-up of sediment or evidence of microbial growth. If the tank has an internal epoxy coating, the coating shall be inspected for evidence of chipping, flaking, or other deterioration.

The annual fuel system inspection will also include some maintenance activities like: meter/gauge/pressure relief valve calibration, filter changes, and checks of the water defense system, tank vents, floating suction mechanism, checking of fuel storage safety systems (high level alarm, leak detection, etc.), etc as well as completion of ongoing maintenance requirements.

10.7.8 Inspection of Portable Fuel Transport Tanks

See the APPENDIX 4 Attachment 8 – Fuel Transport Tank Checklist.

10.7.9 Jet Fuel Reference Publications

See Table 1: References.

11 FIREFIGHTING EQUIPMENT, MAINTENANCE AND INSPECTION

11.1 Extinguishing Media Stock and Discharge Rate Requirements

Firefighting extinguishing media stock levels and discharge rates shall be established for each facility based on a risk assessment and regulatory requirements. See RP Nbr: 161 and RP Nbr: 162 for guidance on firefighting system design.

11.2 Crash-Fire-Rescue Equipment

The Maintenance Requirements Listing at APPENDIX 3, Attachment 1 – Helideck and Associated System Maintenance Requirements provides a listing of required equipment required to respond to an aircraft crash on a facility. Quantities of equipment and personnel protective equipment (PPE) shall be appropriate to the scale of the operation and the number of trained personnel in the emergency response team.

All personnel assigned to crash-fire-rescue and firefighting duties shall be provided with personnel protective equipment (PPE). The following equipment shall be provided and shall meet the specifications (or equivalent) below:

Crash-Fire-Rescue Equipment		
Equipment	**BS/EN**	**NFPA**
Helmet with Visor	BS EN 443	NFPA 1971
Gloves	BS EN 659	
Boots (footwear)	BS EN ISO 20345	
Tunic and Trousers	BS EN 469 or BS EN ISO 14116	
Flash-Hood	BS EN 13911	

Table 33: Crash-Fire-Rescue Equipment

11.2.1 Crash Box

For manned facilities a minimum of one vertical waterproof cabinet with shelves (one by each helideck access point preferred). The cabinet shall be located on landings close to the helideck, or at the primary entry to the access stairwell.

The doors of the cabinet shall be secured with low-strength lock wire/frangible seal that could be easily broken, but which would indicate that a cabinet contents have been tampered with.

Each cabinet shall have a list of contents affixed to the inside.

Each cabinet shall be lit by external lighting if night operations will be used.

11.3 Firefighting Maintenance Requirements

For firefighting system maintenance requirements see APPENDIX 5 – Fire Fighting System Maintenance Requirements. The requirements at APPENDIX 5 shall be amended as necessary to align with the manufacturer's recommendations or local regulations.

Note: In the absence of local regulatory requirements, the procedures outlined in The National Fire Protection Association NFPA 418, Standard for Heliports [6] should be followed.

11.4 Firefighting System Inspections

11.4.1 General

All inspections, including daily, monthly, bi-annual, and annual shall be documented, discrepancies tracked to closure, and records maintained for a minimum of two years. See the Checklist located at APPENDIX 5 – Fire Fighting System Maintenance Requirements.

Personnel performing firefighting system inspections shall be properly trained (Section 12).

See the Helideck Inspection Checklists, which include the required firefighting system checks.

11.4.2 Daily Firefighting System Inspection

The Daily Firefighting System Inspection will include a check that assures required firefighting and crash rescue and firefighting equipment is readily available and serviceable.

11.4.3 Monthly Firefighting System Inspection

The Monthly Firefighting System Inspection will include visual checks of the portable extinguishers and an update of the monthly inspection tags in addition to the daily items mentioned above.

11.4.4 Annual Firefighting System Inspection

The Annual Firefighting System Inspection shall include an evaluation of the bulk foam stocks and finished foam from the nozzles in addition to the daily and monthly items above. The annual check will also include an operational test of the helideck foam system.

11.5 Other Helideck Associated Equipment Maintenance and Inspection

For other helideck associated support system equipment such as those listed below, see APPENDIX 3, Attachment 1 – Helideck and Associated System Maintenance Requirements and Inspection Checklists at the end of this document.

a) Weather System
b) Weight Scales, minimum capability of weighting up to 500 pounds (230 kg)
c) Communications and Navigation System
d) Lighting System
e) Miscellaneous Equipment (stretchers, chocks, fuel response, etc)

12 TRAINING

12.1 General

All personnel designated responsibilities for helideck operations inclusive of passenger handling, fueling operations, and crash-fire-rescue shall be properly trained in these responsibilities both on an initial and recurring training basis. This training shall be documented and records retained on the facility and readily available for review during annual helideck inspections.

Course	Recommended Source Reference (or Equivalent)	Para
Helicopter Landing Officer (HLO)	OPITO 7040, 7042, 7542	12.2
Helideck Attendant (HDA)	OPITO 7040, 7045, 7541	12.2
Helideck Inspector	Helideck Inspector Awareness Training (HIAT) by the Helideck Certification Agency (HCA)	12.3
Fire Guard (FG)	OPITO 7041 (Helideck Emergency Response Team Member (HERTM) Training)	12.4
Refueling	FAA AC 150-5230-4B	12.5
Weather Observer	CAP 437 or US NWS SAWS Requirements	12.6
Passenger HUET	OPITO 5095	12.7
Dangerous Goods	IATA Dangerous Goods Regulations	12.8

Table 34: Training Courses and References

12.2 Helicopter Landing Officer (HLO) and Helideck Assistant (HDA)

Personnel designated to be HLOs or HDAs shall have training to the equivalent of the curriculum elements provided in OPITO's "Helideck Operations Initial Training Standard" (see References for a detailed listing of the OPITO Courses). Figure 12 provides an example of the training progression requirements for HLOs and HDAs.

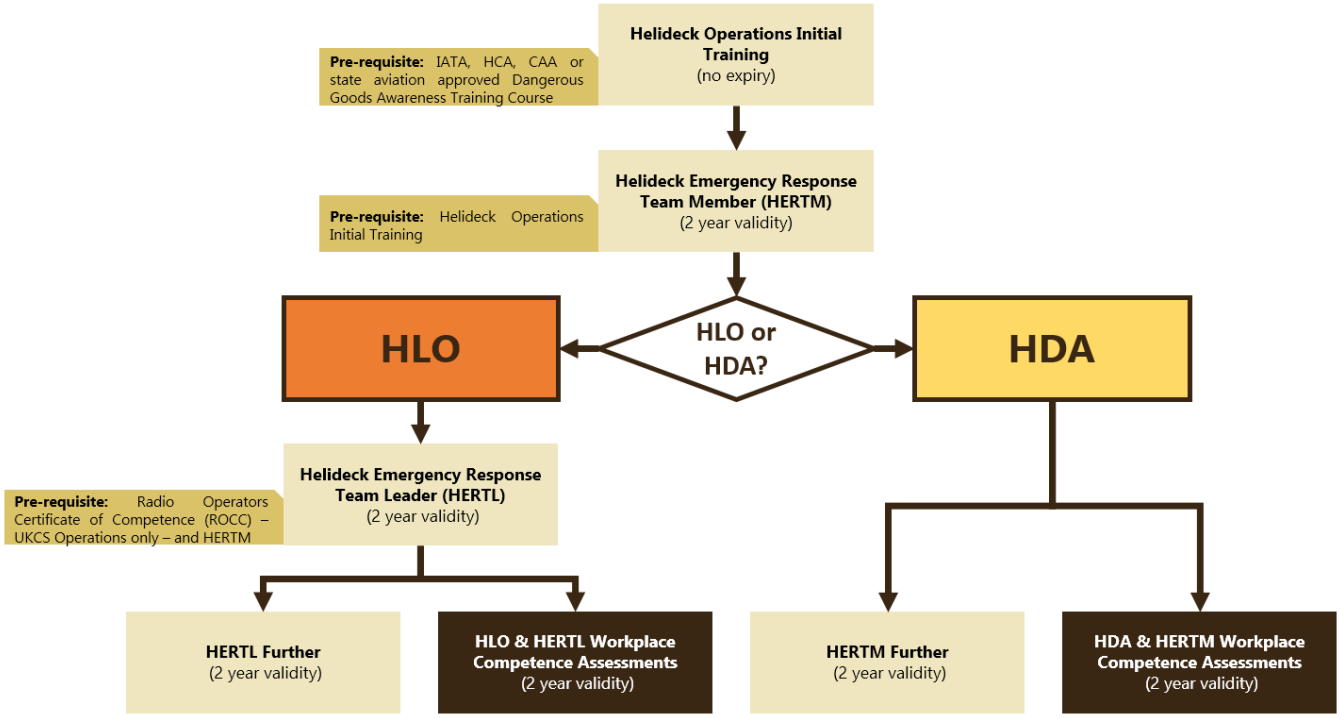


Figure 12: Extract of OPITO HLO/HDA Example Training Progression

12.2.1 Medical Requirements (if locally applicable):

Possess a valid, offshore medical certificate or possess an operator approved medical certificate, or undergoes an appropriate medical screening by the training establishment

12.2.2 HLO/HDA Training Elements Summary

Elements	HLO	HDA
DG/HAZMAT Awareness (see 12.7) (3 Years)	✓	✓
HLO/HDA Initial Training Helideck Operations	✓	✓
Helideck Emergency Response Team Member (HERTM)	✓	✓
Radio Operations	✓	
Helideck Emergency Response Team Leader (HERTL)	✓	
Fuel System Operations (If installed on the facility)	✓	✓
HERTM Refresher and HDA Competency Assessment (2 Years)		✓
HERTL Refresher and HLO Competency Assessment (2 Years)	✓	

Note: These Elements may be combined in equivalent courses

Table 35: HLO/HDA Training Elements Summary

12.2.3 Initial Training for HLO/HDA

Initial Training is designed to meet the requirements for routine and emergency response operations for Helicopter Landing Officers as shown in Figure 12 and Table 35: HLO/HDA Training Elements Summary.

Prerequisites for HLO Initial Training is previous experience as helideck assistant (HDA) at an offshore installation, or have some previous experience of handling helicopters either onshore or offshore. HDA's are not required previous experience.

Initial training for an HLO/HDA shall be conducted at an onshore training facility. This training will be followed by company and installation specific training inclusive of emergency response training.

Relevant dangerous goods awareness training for helideck personnel must be successfully completed (see 12.8).

12.2.4 Initial Training Content

a) Offshore helideck regulations and guidelines
b) Helicopter and helideck hazards
c) Preparation for helicopter landing, inclusive of checking equipment and systems
d) Passenger and freight handling
e) Preparations for helicopter departure
f) Helicopter refueling: preparation, refueling, shutdown of refueling (if required for the facility)
g) Response to helicopter emergencies (HLOs get additional training as a response team leader)
h) Weather reporting (see 12.6) and helicopter limitations in adverse weather
i) Radio calls and phraseology (HLO Only)
j) Incipient fire fighting

12.2.5 Recurrent/Refresher Training

Recurrent/Refresher training shall be conducted at 2 year intervals and shall consists of a review of the contents covered in initial training and any regulatory or industry helideck guidance changes in the last 2 years and a competency assessment. See OPTIO references in Table 35.

12.2.6 Competence

HLOs/HDAs shall demonstrate competence in the duties and activities mentioned below to be endorsed for performance of these duties. Competency assessment shall be performed every 2 years. See OPTIO references in Table 35.

a) Maintain a state of readiness
b) Identify and locate helicopter operational hazards, hazardous areas, access routes and points
c) Identify, locate and operate all relevant equipment and controls
d) Conduct emergency exercises
e) Supervise helicopter landing and departure
f) Prepare for helicopter landing
g) Prepare for helicopter departure
h) Supervise cargo handling
i) Co-ordinate preparation of cargo
j) Supervise loading and unloading of passengers, baggage and cargo
k) Supervise the refueling of the helicopter
l) Prepare for refueling

m) Refuel the helicopter
n) Shutdown the refueling process
o) Control the response to emergencies
p) Respond to appropriate alarms
q) Prepare to enter the incident area
r) Enter the incident area and work safely
s) Control the rescue of personnel
t) Control firefighting operations
u) Control non-firefighting operations

12.3 Helideck Inspector Training and Competence

An acceptable means to achieve competence for "Helideck Inspectors" shall include the following elements:

a) Completion of an initial helideck inspection course incorporating the necessary elements of the relevant HSAC Helideck RPs or other local/regional helideck design standards/practices. Course content should include the following:

Helideck Awareness Inspector Training Course Typical Content				
Basics				
Basic Auditing and Inspection Techniques	Offshore Installation Protocols and Procedures	National Regulatory Requirements		
Helideck				
Landing Area Dimensions, Surface, Lighting and Markings	Helideck Equipment, including: Rescue and Fire-fighting, Arrangements, Radio Equipment, Meteorological Equipment, Floating Facility pitch, roll and heave limits, and Approach Aids		Turbulence created by Superstructure and/or Exhausts	
Access Stairways	Obstruction Environment	Protective Clothing	Fuel System	
Emergency Response	Documentation Requirements	Helideck Team	Safety Nets/Helideck and Perimeter	
Training				
HLO/HDA/FG	Dangerous Goods	Refueling	Weather Observer	VHF Radio Licensing

Note: the only known courses for helideck inspectors are the Helicopter Certification Agency in the UK with courses offered in other countries such as Australia and Africa in cooperation with Flight Safety, and an oil company course in the Gulf of Mexico in the US.

Table 36: Helideck Awareness Inspector Training Course Typical Content

b) Observation of (a) helideck inspection(s) with a competent helideck inspector.
c) Completion of one or more helideck inspection(s) conducted under supervision of a competent helideck inspector who, when applicable, signs off the trainee as a competent helideck inspector.
d) Complete recurrent training that must contain updates to the used standards/guidelines at least once every 2 years either with in-house or an outside source.

e) To remain a competent helideck inspector, at least two helideck inspections must be completed annually and recurrent training must have been completed as mentioned above.
f) If recurrent training or if currency has lapsed, the lapsed inspector shall complete a refresher (initial or recurrent) training and complete a helideck inspection with a trained helideck inspector to receive their renewed sign-off.

Note: A demonstrated high number of helideck inspections performed for an oil company or air operator may be considered as a substitute for the requirements under 12.3 a) thru c) and grand-fathered in as acceptable means of conformance, but shall be assessed and documented on an individual basis.

12.4 Firefighting Training

12.4.1 General

The helideck crew shall demonstrate their knowledge and skills required to respond to crash-fire-rescue and fire response incidents, inclusive of all requirements in Section 13.

The HLO/HDA must be able to demonstrate:

a) Controlling the emergency helicopter landing preparations
b) Controlling the preparations for entering the incident area
c) Controlling emergency response entering the incident area
d) Controlling rescue of personnel
e) Controlling firefighting operations
f) Controlling non-firefighting operations

Fireguard must be able to demonstrate executing firefighting operations

Note: A Fireguard must be trained in a multi-day fire-fighting course that includes use of self-contained breathing equipment (SCBE), or a fully trained second HDA can assume fireguard duties.

12.5 Refueling Training (where a refueling system is installed on the facility)

HLOs and HDAs or other designated refueling personnel shall be trained in basic refueling requirements for helicopters, inclusive of quality control and associated firefighting aspects.

All aspects of refueling covered in various sections of this RP shall be covered in the training program.

Note: In certain cases the facility owner does not own the fuel in the refueling system and therefore the helideck team members are performing quality assurance activities on behalf of the fuel owner (e.g. helicopter operator). In this case, a specific authorization or approval process by the helicopter operator may be necessary before being authorized to perform fuel system related duties.

12.6 Weather Observer Training

Weather observer training is required for certain personnel on all manned facilities. At least one trained weather observer shall be available at any time during helideck operations.

12.6.1 Initial Weather Course Content

a) Introduction to aviation meteorology (weather patterns, air masses and fronts) and understanding their potential impact on offshore helicopter operations.
b) Meteorological coding interpretation, including TAF, METAR, CAVOK etc.
c) Understanding national/international weather systems.
d) Training in the use of HMS (Helideck Monitoring Equipment) and related procedures.
e) Training in the use of contingency meteorological equipment and procedures in case of the failure or unavailability of automated sensors.
f) The process of creating an accurately encoded offshore weather observation.
g) Access to the relevant support material.
h) Estimating visibility from offshore helidecks and limitation of sensors.
i) Observing precipitation including freezing precipitation.
j) Observing and reporting lightning and thunderstorms.
k) Identification of convective clouds and the operational significance of differing cloud types.
l) Estimating cloud amounts and cloud bases and limitation of sensors.
m) Reporting of pressure including QNH, QFE and the significance of this to offshore helicopter operations.
n) Reporting of sea conditions i.e. Sea State and Wave Height.
o) A review of weather reporting and associated pros & cons from an aircrew perspective.
p) Rig let-down and (ARA) Airborne Radar Approach & (HOGA) Helideck Offshore GPS Approach Procedures, in the context of inclement weather conditions and the associated critical need for accurate reporting.

12.6.2 Refresher Weather Observer

The Weather observer refresher course shall have the following content:

a) Confirm ability to accurately identify cloud types, heights and amounts and report them correctly to maintain the safety of offshore helicopter operations;
b) Review the procedures for assessing visibility and identifying weather phenomena;
c) Refresh knowledge of the correct practices for reporting wind, temperature and pressure;
d) Update knowledge on changes to meteorological observing practices and procedures;
e) Confirm maintenance of the required standard of Offshore Weather Observers.

Weather Course	Description	Who Should Attend	Typical Duration
Basic Observation	Provides training in basic weather observation for VFR operations, but no certification.	HLOs, personnel stationed at the weather observer system displays.	2 Hours
Certified Weather Observer	Provides certificated training in weather observation for IFR/night operations valid for 2 years.	Personnel providing weather observations for IFR or night operations or where an automated weather observation system (AWOS) is in use.	2 Days
Refresher Training for Weather Observers	Provides basic refresher training in weather observation for certified observers	All certified weather observers every 2 years.	2 Hours On-line **-or-** a Ground Course

Table 37: Weather Observer Training Requirements

12.7 Passengers

Helicopter Underwater Escape Training (HUET): Due to the nature of offshore helicopter flights, all passengers shall have helicopter HUET (OPITO approved training preferred) on a four-year basis. In addition to HUET, it is strongly recommended that an emergency breathing system (EBS) be adopted for passenger use to enhance underwater egress opportunities with EBS using compressed air (CA-EBS) being the preferred standard.

12.7.1 HUET Training Options

HUET Course	Description	Typical Duration
Helicopter Underwater Escape Training (HUET) -or- **Tropical HUET (THUET)[2]**	Basic HUET with or without EBS, includes aircraft evacuation, various drills including rollover submersion with escape, life raft use and water survival.	1 Day
Basic Offshore Safety Induction and Emergency Training (BOSIET) -or- **Tropical BOSIET (TBOSIET)**	Initial offshore safety course, includes HUET with /without survival suit, basic firefighting, first aid, and facility abandonment	3 Days
Further (Refresher) Offshore Emergency Training (FOET) -or- **Tropical FOET (TFOET)**	Refresher offshore safety course for those who have completed BOSIET/TBOSIET. FOET/TFOET previously, includes HUET, Firefighting, First Aid	1 day

Note 1: All the above may include EBS without or with compressed air (preferred)

Note 2: Tropical indicates this HUET is appropriate for warm water and does not include use of survival suits.

Note 3: The HUET should be completed in fuselage with exits configured as representative of what the passenger is likely to encounter. Minimal duration of training is usually 4 hours.

Note 4: HUET completed in a chair rather than a representative fuselage is not recommended.

Table 38: HUET Training Options

12.7.2 Egress Training Objectives

Each HUET trained individual shall have the ability to perform the following in the event of a helicopter ditching:

a) Locate the emergency exit window/door
b) Recognize the emergency exit opening mechanism
c) Comprehend the instructions for operating the emergency exit window/door
d) Understand the importance of having a reference point inside the aircraft for orientation
e) Push out the emergency exit window/door so that it will not impede use of the exit
f) Pass expeditiously through the emergency exit without kicking their feet

Note: If EBS is in use, the HUET training should include training on the actual system in use and a demonstration of differences between systems in use in the industry.

12.8 Dangerous Goods/Hazardous Materials (DG/HAZMAT).

Dangerous goods training shall be conducted every 24 months using the guidance contained in the IATA Dangerous Goods Regulations, or CFR 49 every 36 months, or equivalent.

DG/HAZMAT Courses	Who Should Attend	Typical Duration
Awareness	All personnel associated with helideck operations or who may be involved with: Storage and loading of cargo Storage and loading of baggage Passenger handling and security staff responsible for screening passengers and their baggage.	½ Day
Acceptance	Personnel who will be accepting air cargo that may contain DG/HAZMAT	1-3 Days
Shipping	Personnel who will be accepting, packaging and preparing DG/HAZMAT for air shipment	1 Week

Note: Acceptance courses are sometimes combined with Awareness courses.

Table 39: Dangerous Goods/Hazardous Materials Training

13 EMERGENCY RESPONSE

13.1 Risk Assessment

Facility owners must complete a risk assessment which includes emergency response aspects for the facility as a whole and helideck operations specifically, shown below and in paragraphs 6.3, and 13.1, which shall consist of the following items:

a) The identification of the events which could cause a major accident involving fire or explosion; or the need (whether or not by reason of fire or explosion) for evacuation, escape or rescue to avoid or minimize a major accident.
b) The evaluation of the likelihood and consequences of such events.
c) The establishment of appropriate standards of performance to be attained by anything provided by measure for;
d) Ensuring effective evacuation, escape, recovery and rescue to avoid or minimize a major accident, and
e) Otherwise protecting persons from a major fire or explosion, and
f) The selection of appropriate measures.

13.2 Emergency Response Plans (ERP)

Each manned facility shall have an emergency response plan for helidecks as part of or linked to their HOM, which shall also include response for any NUIs included in the particular facility area.

Particular attention should be given to clearly outlining communication procedures between aircraft and the marine vessels and/or other resources involved.

Facility owners and helicopter operator's shall modify their respective ERPs when affected by regulatory or operational requirement changes. In some cases, such as MODUs, where aviation services are normally not contracted by the facility operator, both the installation management and the oil company must coordinate overlapping plans. It is also recommended that the all involved parties review all relevant ERPs for gaps and amend documents as necessary. An interface or bridging document may be needed to document prevalent processes and procedures from the ERPs in case of an emergency.

13.3 Documents

Offshore Installation Operators/Vessel Owners shall display or provide copies of appropriate safety/rescue data and technical manuals for reference to the helideck crew(s). These documents shall include:

a) Helideck Operations Manual (HOM) manual specific to the installation/vessel. Inclusive of procedures to be followed by helideck team personnel in the event of a helicopter mishap
b) Posters showing means of access to helicopters (see 9.12.1).
c) Emergency escape routes.

13.4 Planning Considerations

The types of incidents likely to be encountered by helideck crews can be categorized as follows:

a) Low impact crash/fire.
b) Low impact crash/no fire.
c) High impact crash.
d) Emergency and precautionary landing on the helideck
e) Helicopter ditching near the facility.
f) Engine fire.

Note 1: Search and rescue capabilities by both aircraft and vessels are significantly limited at night, and should be taken into account if late afternoon or night flights are undertaken.

Note 2: If a fire should occur on start-up the HLO must signal the pilot. Portable equipment (CO2 with long lance, etc) should not be used until the indication is given to do so by the pilot of the aircraft, or when it is obvious a fire has occurred.

13.5 Emergency Procedures for Helideck Teams

The following paragraphs offer checklists for various types of emergencies. The HLO must be knowledgeable with the actions that shall be taken in the event of accidents or emergencies involving helicopters on the facility.

13.5.1 Helicopter Approaching Helideck during Facility Alarm

The HLO shall:		Check
1	Advise the Pilot of an approaching aircraft of the alert status.	☐
2	Instruct the Pilot to abort the approach and divert to another installation, or hold in the area, depending on weather conditions and fuel state.	☐

13.5.2 Helicopter on Helideck during General Facility Alarm

The HLO shall:		Check
1	Coordinate lifesaving/firefighting actions in accordance with the installation emergency response plan.	☐
2	Advise Pilots to prepare the helicopter for immediate take-off. If no further information is received from the Offshore Installation Manager (OIM)/Vessel Master declare the deck clear for take-off.	☐
3	In case of a toxic gas alarm, muster at the aircraft to prepare for an immediate take-off. Standby to receive passengers and await instructions from the Offshore Installation Manager (OIM)/Vessel Master.	☐

13.5.3 Helicopter Crash on the Helideck

The HLO shall:		Check
1	Raise the alarm using his radio to Radio Room/Central Control Room (CCR).	☐
2	Establish and maintain contact with the radio room, CCR or Incident Room throughout any subsequent firefighting and crash-fire-rescue operations.	☐
3	Contact the OIM/Master at the earliest opportunity.	☐

13.5.4 Crash on Deck, Major Spillage with No Fire

The HLO shall:		Check
1	Raise the alarm by operating the break-glass call point or via radio to the radio room.	☐
2	Direct the helideck fire team to lay a foam blanket around and under the aircraft.	☐
3	Direct the evacuation of the aircraft.	☐
4	Establish and maintain contact with the Radio Room/CCR/Incident Room as required.	☐
5	Contact the OIM/Master at the earliest opportunity.	☐

13.5.5 Helicopter Incident on Landing

The HLO shall: In the event of a helicopter incident on landing where it is obvious that damage may have been caused to the aircraft or the installation.		Check
1	Inform the OIM/Master immediately.	☐
2	Advise the pilot of his observations and request for the aircraft to remain on deck.	☐

13.5.6 Man Overboard

The HLO shall:		Check
1	If a helicopter is on the deck, be prepared to assist the aircraft when requested.	☐
2	If the helideck is not in use, prepare the helideck for operations and stand by to receive an incoming Search and Rescue aircraft. If it is diverted to the installation/vessel, inform the vessels standing by of anticipated helicopter movements.	☐
3	Maintain communication with Radio Room/CCR/Incident Room.	☐

13.5.7 Helicopter Requesting Facilities for an Emergency Landing ('ALERT' status)

	The HLO shall:	**Check**
1	Order the departure of any helicopter on the helideck and hold off or divert any scheduled incoming aircraft.	☐
2	Instruct cranes to lay down loads, move crane booms to a safe position and await further orders (via Radio Operator – air band).	☐
3	Check that the approach and overshoot areas are clear.	☐
4	Test foam-making equipment and ensure that it is ready for instant use.	☐
5	Ensure Emergency Response Team is properly briefed, standing-by and dressed in fire protective clothing.	☐
6	Inform the radio room when the deck is clear and ready to receive the helicopter.	☐
7	Maintain communications with the radio room (via air band).	☐
8	Ascertain the number of Persons on Board (POB) on the aircraft, if not already done.	☐

13.5.8 Evacuation by Helicopter

	The HLO shall: In the event of evacuation by helicopter, the HLO and helideck crew shall leave their Muster Station when instructed by the OIM/Master and proceed as follows:	**Check**
1	Prepare the helideck to receive aircraft.	☐
2	Establish payloads as each aircraft approaches and inform Logistics Coordinator of the number of passengers required on deck.	☐
3	As each helicopter departs, report to Logistics Coordinator the number of evacuees lifted off.	☐

13.5.9 Significant Fuel Spillage, Rotors Running

The HLO shall:		Check
1	Immediately stop refueling the helicopter.	☐
2	Inform the pilot of the circumstances. The pilot will decide whether to shut down or take off.	☐
3	Once the aircraft has taken off or shut down, direct the hosing down of the helideck with water or foam to wash away the fuel prior to any further operations. If the aircraft remains on deck, care must be taken not to spray it with salt water.	☐

13.5.10 Aircraft Ditching in Vicinity of Facility

The HLO shall:		Check
1	Raise the alarm by operating the break-glass call point or via radio to the radio room.	☐
2	Contact the OIM/Master at the earliest opportunity.	☐
4	Request Fast Rescue Boat (or Life boat) to be launched to rescue helicopter occupants.	☐
6	If the acting HLO is also the medic or has any other safety critical role needed in the response, have alternate HLO take over helideck duties.	☐
7	If the helideck is not in use, prepare the helideck for operations and stand by to receive an incoming Search and Rescue aircraft.	☐
8	Maintain communications with the radio room (via air band).	☐

13.5.11 Installation Status Change with Aircraft on Deck

The HLO shall:		Check
1	The HLO should contact the OIM or Vessel Master or Radio Room to receive further instructions.	☐
2	Switch on Helideck Status Lights if applicable and inform flight crew of occurrence by radio.	☐

13.6 ERP Scenario Drills and HLO Staff Training

Facility helicopter related scenario emergency drills with specific objectives shall be conducted within 30 days of a new offshore manned facility project start and quarterly, as a minimum, for ongoing operations. In this drill each person on the installation to whom duties have been assigned in the event of an emergency, is instructed in the correct use, handling or operating of emergency equipment, and all emergency equipment used in the drill is examined, cleaned and, where appropriate recharged.

The drill should involve the helicopter operator and include pilots, support staff, aircraft, and be integrated with marine or land surface resources.

Exercises involving aviation aspects of the Operator's Emergency Response Plan (ERP) shall test field and offshore communications capabilities, offshore installation ERP, as well as aviation coordination with ground and marine resources.

In addition to facility wide emergency response drills, the HLO is responsible for carrying out helideck team only emergency training scenarios (crash/fire/rescue/emergency procedure drills) with the helideck team on a monthly basis. These may include desktop as well as hands-on training.

In all cases, drills and training will be documented and retained for a period of 24 months, along with a list of participants and any lessons learned,

The types of exercises that can be planned (but not be limited to) include the following:

a) Fire - involving an aircraft, and/or heliport.
b) Missing, or overdue aircraft.
c) An aircraft forced landing, onshore and offshore.
d) Search and Rescue operation, use of emergency equipment to include Linked Raft Rescue System.
e) Helicopter winching exercises.
f) Oil and Fuel spill - air support and spray buckets.
g) Medical evacuation, including stretcher drills.

13.7 Planning and Conducting Emergency Response Drills

The planning for the safe conduct of drills shall be documented and discussed with the aviation participants prior to the conduct of any exercise.

Any safety restraints as a result of night operations or restrictions due to weather should be documented in this plan.

Active participation from the helicopter operator is expected in the determination of the weather minimums for the conduct of the drills.

Issues that should be taken into account include visibility, wind speed, temperature limits and sea states.

To validate the integrity of the specific scenario drill, the exercises should be varied with regard to the time of day, and the day of the week. When applicable to the activities of the facility and helicopter operator, this should include after-hours operations and on weekends.

At the conclusion of each exercise the drill shall be critically assessed and all personnel fully debriefed. All subsequent recommendations shall be documented for follow-up action.

13.8 Accident and Incident/Hazard and Near Miss Reporting

13.8.1 When to Report

Information concerning an aircraft involved in an accident (see Terms and Definitions) shall be reported immediately to all involved parties, and any incident or near miss on a helideck shall be reported verbally as soon as practicable, however within max. 24 hours of occurrence to the Operator/facility owner, and in written format within max. 48 hours.

In any event, the adherence to a detailed Emergency Response Plan (Paragraph 13.2) will assist in providing clear and coordinated procedures to deal with all possible scenarios.

13.8.2 Incidents/Hazards or Near Misses

For industry standardization purposes, an aircraft incident is defined in Section 4.

Any operational hazard or near miss shall be reported by the pilot, or other senior operational or maintenance personnel to the helicopter operator and facility owner. An example of a hazard might be an obstacle erected at a helideck, or an unsafe working condition around the facility. See 7.3.6.

Incident/Hazard Report shall be "closed loop" with appropriate review by operations, maintenance, management and feedback to the originator of the report.

13.9 Firefighting

13.9.1 General

All helidecks and supporting facilities shall have a means of extinguishing a fire that is commensurate with the potential risk. The principal objective of rescue and firefighting equipment is to save lives. For this reason, the provision of means of dealing with a helicopter accident or incident occurring at or in the immediate vicinity of a helideck assumes primary importance because it is within this area that there are the greatest opportunities for saving lives. This must assume at all times the possibility of, and need for mitigating, a fire which may occur either immediately following a helicopter accident or incident or at any time during operations.

The most important factors bearing on effective rescue in a survivable helicopter accident are the training received, the numbers of passengers carried, the availability/effectiveness of the equipment, the speed with which personnel and equipment designated for rescue and firefighting purposes can respond and the effectiveness of that response.

> **Note:** If a rescue looks possible it should be attempted without delay, but fire-fighting action must be used to cover personnel involved in the rescue attempt.

13.9.2 Actions to achieve the goals of the fire response

Whatever agents are available and suitable for the type of fire developing should be discharged at high output rates to suppress flame as quickly as possible.

Where only secondary agents (dry powder and Carbon Dioxide (CO_2)) are available, it is important to try to conserve enough of the agent to be able to deal with flashback.

Fire team members with branches or applicators should approach the helicopter and move as close as possible as the situation allows. (Only at locations with fire crews)

Suppress flames surrounding the cabin area.

Gain access to fire in the vicinity of the fuel tanks (e.g. beneath cabin floor, behind rear bulkhead, or in wing sponsons).

Specific procedures shall be developed and practiced for the following fires, inclusive of types of agents to be deployed:

a) External fuselage.
b) Internal fuselage.
c) Fuel
d) Engine
e) Cockpit

Note 1: The fire teams should be aware of spilled fuel and be ready to blanket with foam to prevent ignition.

Note 2: For rescue operations inside a helicopter, foam and water should be used as much as possible, to minimize further injury to passengers.

Note 3: All firefighting hoses shall be on reels, when possible.

Note 4: All firefighting hoses shall be long enough to reach the furthest point on the helideck away from the firefighting position.

13.9.3 Regulatory Firefighting requirements

The requirements of International Civil Aviation Organization (ICAO) Annex 14 are recommended.

Where the requirements of ICAO cannot be met for legacy helidecks, the requirements and firefighting system performance shall, as a minimum, be in accordance with NFPA 418, in particular Chapters 5 and 8, and when fueling systems are provided NFPA 407. Additional Information is available in API 2A-WSD.

Consider, when upgrading a helideck or replacing one in kind, the requirements of HSAC RP 161 shall be met.

Note: The portable fire extinguishing equipment shall be readily accessible to the TLOF and parking area (if installed) and ramps may be necessary to allow the equipment to be easily moved to the upright position for proper operation from the firefighting access facilities or other storage areas to the TLOF/PA surface.

13.9.4 Firefighting Risk Assessment

A risk assessment shall be completed and documented by the facility owner to determine the level of fire protection necessary to contain a post-crash fire (PCF) in the event of a helicopter crash which in a worst case scenario the largest helicopter using the helideck has rolled onto its side with a full passenger load. The fire protection system shall provide adequate time to evacuate all occupants from the helicopter and helideck. HSAC RP 162 provides a sample for a helideck Risk Assessment. HSAC RP 161 Annex B outlines all the parameters to be considered with the design/review of a helideck firefighting system.

When conducting the risk assessment, many parameters shall be considered to determine the scope of the fire protection equipment required for each helideck. At a minimum, parameters that shall be considered include:

a) Size of TLOF (helideck),
b) Presence of a fueling station,
c) Helicopter models that are expected to use the facility including max. personnel on board and fuel capacity of such helicopters,
d) Whether the facility is manned or unmanned, and
e) Typical number of personnel on board helicopter if the facility is manned.

APPENDIX 1 – SAMPLE SAFETY CRITICAL EQUIPMENT (SCE) LISTING

Offshore Helideck Safety Critical Equipment	Inspection Cycle
Weather Reporting Equipment ▸ Wind Speed & Direction Indicator (windsock as a minimum for ALL facilities) ▸ Precision Outside Air Temperature Sensor (manned facilities) ▸ Precision Barometric Pressure Sensors (Dual Sensors) (manned facilities) ▸ Visibility (where equipped with a visiometer) ▸ Cloud Base (where equipped with a ceilometer) ▸ Hand-held Anemometer (manned facilities) **Note:** Sensors shall be positioned in a location that provides the most accurate representation of actual conditions experienced on helideck.	Per the manufacturer, but not less than annual
Helideck Fire Fighting Systems & Protective Equipment ▸ Foam Monitors (if installed) ▸ Foam Hand Branches (if installed) ▸ Hydrant Points (if installed) ▸ Foam Concentrate (Primary and Back-up Supply if installed) ▸ Bunker Coats. Trousers, Boots, Gloves (manned facilities) ▸ Fire Helmets with Full Face Visors (manned facilities) ▸ Self-Contained Breathing Apparatus with Extra Cylinders (if installed) ▸ Portable Complementary Media Fire Extinguishers (Dry Powder and CO_2) **Note 1:** Foam Test Certificates shall be required annually. Foam concentrates and produced foam must be tested. **Note 2:** All parts of the foam production system shall be tested annually.	Per the manufacturer, but not less than annual
Helideck Lighting and Communications Equipment ▸ Obstruction and Crane Operating Lights ▸ Perimeter Lights (where night or IFR operations are planned) ▸ Flood Lights (where installed) ▸ Helideck Status Lights (where installed) ▸ Windsock Lighting (where installed) ▸ VHF Air Band Radio (manned facilities) ▸ Portable VHF Air Band Hand-Held Radios with Headset (1 per helideck team member is required for manned facilities) ▸ Non-Directional Beacon (NDB) (if installed)	Per the manufacturer, but not less than annual
Vessel/Facility Motion Sensing & Reporting Equipment (Vessels, FPSOs, MODUs or other floating facilities) ▸ Pitch, Roll & Heave Measuring Sensors	Per the manufacturer

Offshore Helideck Safety Critical Equipment	Inspection Cycle
Helideck (Structure, Environment and Integrity) ▸ Windsock (Lighted where night or IFR flights may be performed) ▸ Helideck Perimeter Netting or Shelves ▸ Helideck Landing Net (when required for floating facilities) ▸ Helideck Guttering & Down-pipes ▸ Helideck Tie-down Points ▸ Helideck Friction Test/Certification ▸ Helideck Markings, Signs and Paint ▸ Under Helideck Air Gap	Annual
Helideck Emergency Response Equipment (Manned Facilities) ▸ Waterproof & Accessible Crash Box (minimum of one per helideck access point preferred) See APPENDIX 3, Attachment 1, item 6.2 for a listing of required equipment.	Annual (Fit For Purpose)
Scales (Passenger. Baggage, Cargo) (Manned Facilities)	Annual (Calibration)
Miscellaneous Safety Critical Equipment (Manned Facilities) See APPENDIX 3, Attachment 1, Item 5 ▸ Helicopter Chocks (Rubber or Sand Bags: Minimum of 6; 2 per wheeled aircraft wheel) ▸ Helicopter Tie-down straps (minimum of 4; breaking strength of 12,000 lbs.) ▸ HLO & HDA Reflective Vests (flame retardant material) ▸ Prohibited Landing Marker [(4x4 meters; red flag with diagonal yellow cross) ▸ Video/DVD Player/Computer (with passenger safety video/brief) and safety posters ▸ Stretcher ▸ Helideck Team Helmets with Communications (manned facility (if equipped). Radios with headset for Helideck Team members as minimum) ▸ Light wands for the Helideck Team for night operations (if required) ▸ Fuel Spill Kit ▸ Ice and Snow Removal Equipment (if needed)	Annual (Fit For Purpose)

APPENDIX 2 – SAMPLE MOPO MATRIX

Matrix Of Permitted Operations (MOPO) - Helicopter Ops Example

	High Winds (15 - 26 knots; 19 - 30 mph)	High Winds (>26 knots; > 30 mph)	Lightning/Thunderstorms (Consider distance and speed of approach)	Heavy Rain	Water Spouts	Low Visibility at Location (< 300 ft)	Low Visibility at Base (support operations) (e.g., due to fog)	High Swells (>8 ft)	High Swells (> 12 ft)	Current (>1.5 knots)	Extreme Cold (< 32 F)	Extreme Heat (> 110 F)	Night (assumes adequate artificial lighting is available)	External Security Threats	Excessive Facility Motion
Helicopter Flight Operations	Wind <= 20 kts, no restrictions	Wind >26 kts (up to 30 kts), 45 minute fuel reserve for one-way fuel flights	An approach is not to be commenced if thunderstorm activity or significant Cb is observed or reported to be present at, or within 10Nms of the platform. Holding in VMC clear of the Cb or thunderstorm activity, is to be considered if the normal holding area is subject to such activity - 30 mins holding fuel is sufficient to assure this. Flights will not depart, if significant Cb or thunderstorm activity exists over or within 10Nms of the departure location. If, from the best information available to the pilot before flight, there is a probability that Cb or thunderstorm activity will occur at any point on the intended track to the destination and alternate, or within 15Nms of that track, then the following instruction will apply: -- The flight will not depart, unless the aircraft's weather radar is serviceable; -- Additional fuel will be carried to permit track deviations or additional holding capability. A minimum of thirty minutes additional holding fuel is to be carried.		Helicopter to leave if possible.	VFR Offshore - Day: Min Operating Height: 500 feet, Cloud base: 600 feet and visibility 3 Statute Miles. OR VFR Offshore - Day - interfield flight only when visual contact is maintained with other facilities: Min Operating Height: 400 feet, Cloud Base: 500 feet and visibility 1/2 Statute Mile.	VFR Offshore - Day: Min Operating Height: 500 feet, Cloud base: 600 feet and visibility 3 Statute Miles. OR VFR Offshore - Day - interfield flight only when visual contact is maintained with other facilities: Min Operating Height: 400 feet, Cloud Base: 500 feet and visibility 1/2 Statute Mile.	Helicopter operations are allowed in accordance with the sea state for which the aircraft flotation system is certificated. **S-92 (GoM) : Sea State 5** (max wave height 13ft) **AW-139: Sea State 6** (max wave height 20ft) **S-76C++:Sea State 4** (max wave height 8ft) **EC-135: Sea State 4** (max wave height 8ft)			Link to Document **'Cold Weather Operations'**	Potential payload reduction due to degraded engine performance at higher temperatures. Contact heliport dispatcher prior to flight.	Emergency Response Flights Only. Helideck Lighting shall be functional and 'ON' (perimeter lights, flood lights and status lights) Night Flights should be flown using only IFR procedures and minimums where available, otherwise the VFR minimum shall be a cloud base of 1000 feet with 100 feet of vertical cloud clearance and 3 SM visibility. Twin-engine IFR certified helicopter with dual IFR-night current crew. All night flights should utilize IFR cockpit procedures for takeoffs and landings.		Link to **'PRH Document'**
	Wind >20 kts (up to 26 kts), 45 minute fuel reserve for one-way fuel flights	Winds > 30 kts, 30/30 rule applies to ALL helicopters (When winds are above 30 knots, no ground movement should be made if winds are more than 30 degree off either side of the nose of the aircraft)			If helicopter cannot leave due to vicinity of water spout: full tie-down of helicopter on deck. Flight crew, helideck team and passengers remain in safe place indoors at platform.	IFR - Aircraft, Operated Dual Pilot: Ceiling 300 feet, visibility 2 Statute Miles	IFR - Aircraft, Operated Dual Pilot: Ceiling 300 feet, visibility 2 Statute Miles								
Helicopter Fueling Operations			No fueling operations with lightning/Thunderstorms in vicinity										Flood lights and perimeter lights functional and 'ON'		

LEGEND:		
	=	Operations allowed.
	=	Operations allowed, with conditions. Refer to relevant Standard or Rationale.
	=	Operations not permitted without variance signed off by Ops Manager. (Aviation requirements cannot be varianced by OM)
	=	Operations not applicable at location.
NRA	=	Non-Routine Activity, requires additional medical resources (Medevac, supplies, etc.).

APPENDIX 3 – HELIDECK AND ASSOCIATED SYSTEM MAINTENANCE, INSPECTION AND HELIDECK DAILY STATUS REPORTS

Attachment 1 – Helideck and Associated System Maintenance Requirements

#	Area of Maintenance	Preventive/Corrective Actions	Frequency (Reference)
1	**Helideck**		
1.1	Helideck Guttering & Down-pipes	Any damages, repair as needed.	As Needed
1.2	Bird Guano Effects	The effects of bird infestation include the obliteration of essential markings (see 1.3 below), a reduction in the friction qualities of the surface (see 1.5 below), and effects on personnel health and safety due to the highly toxic and slippery-when-wet nature of guano (e.g. effect on the lungs due to inhalation of dried guano 'dust', slips and trips on wet-guano surfaces). When surface contamination causes a degradation, the surface shall be cleaned (see Note below) **Note:** Verify that a Control of Substances Hazardous to Health assessment has been carried out to cover personnel exposure during cleanup and disposal operations, and that adequate PPE is provided for the cleanup.	As Needed
1.3	Helideck Markings	If Markings are obscured or friction is reduced due to contamination by guano, snow, etc.; clean until markings are clear and friction levels are restored.	Daily
		If Markings are faded or friction values are not acceptable (see 1.5 below); repaint in colors and dimensions prescribed in HSAC RPs 161/162 while ensuring mandated friction values are achieved	As Needed
1.4	Helideck Tie-down Points	If corrosion damage is discovered, review by an engineer and replace if load-carrying capability is compromised.	As Needed
		If water is trapped in the tie-down points it should be removed, especially in cold weather regions.	Daily
1.5	Helideck Surface Friction	1) The helideck surface shall be evaluated for adequate friction in all directions. Minimum acceptable values are shown in the table shown below **Section of helideck Measurement** TD/PM circle and H painted markings 0.65μ Outside TD/PM circle 0.50μ **Note 1:** UK CAP 437 provides recommendations for evaluation protocols based on the helideck surface type. **Note 2:** If friction levels are inadequate In the TDPM area, a landing net may be used until the next repaint, if skid equipped helicopters are not in use. **Note 3:** Friction coefficient is depicted as μ. 2) If the minimum values above are not achieved, repaint/paint the affected surfaces or depending on the surface type grit blasting may achieve the desired results.	Annual (CAP 437)

#	Area of Maintenance	Preventive/Corrective Actions		Frequency (Reference)
1.6	Helideck Landing Net (when installed) (see 1.5)	If net can be lifted upwards more than 10 inches (25 cm) at its center point, re-tension while ensuring the net does not extend beyond the TDPM area.		Daily
		If net is dirty with reduced friction, clean as necessary to ensure adequate friction is provided.		As Needed (CAP 437)
		Replace net when the net is deteriorated, contamination cannot be adequately cleaned or the age has reached the manufacturer's life-time limit.		As Needed
1.7	Perimeter Safety Net or Shelf	Repair as needed with same material as used in original design (other materials have different wear properties) or upgrade if the netting is covered with a plastic covering. Replace all material for a complete panel as a minimum. Preference that all netting on the facility be replaced if materials from some or all netting has deteriorated below acceptable levels.		As Needed
		Depending on the materials used for the netting, the following evaluations shall be performed:		Annual
		a	**Chain Link Fencing Material**. Test one panel of perimeter safety netting material for load bearing capability of 300 lbs. Drop tests offshore are not permitted. Uncoated chain link fencing material perimeter nets should be uses and should have a sacrificial panel installed that has gone through the same environmental conditions as the rest of the perimeter net after initial install. This sacrificial panel shall be send in to an onshore test facility to have an integrity test performed. If no sacrificial panel is installed, the netting should be replaced not later than 5 years after initial installation date.	
		b	**Helimesh Fencing Material**. Follow Helimesh manufacturer guidelines. The test report will provide the anticipated year of replacement of the netting arrangement. If Helimesh testing is not performed in accordance with the manufacturer's recommendations, Helimesh netting arrangements need to be replaced not later than 10 years after initial installation date.	
		c	**FricTape Fencing Materials**. Inspection loops with serial number and manufacturer date are part of the netting arrangement. Cut off an inspection loop and send it to the manufacturer's testing facility. A report with the results will be provided upon completion of the test. The inspection report will provide the anticipated year of replacement. If FricTape testing is not performed in accordance with the manufacturer's recommendations, FricTape netting arrangements need to be replaced not later than 7 years after initial installation date.	

#	Area of Maintenance	Preventive/Corrective Actions		Frequency (Reference)
		d	If **other materials** are used, similar procedures to the above shall be developed and implemented in cooperation with the manufacturer.	
1.7	Perimeter Safety Net or Shelf	Safety netting or shelving support structure and net attachments. If visually damaged or if evaluation determines structure is weakened; shall be replaced with equivalent original materials.		As Needed
1.8	Signage and Visual Aids for Access and Emergencies	Signage if faded, damaged or improperly situated should be repainted, repaired, or relocated.		As Needed
1.9	Helideck Supporting Structure	Repair damages from corrosion, rust, etc as needed following "engineering" review with material providing equal or improved load capability as used in original design.		Annual (Section 7 API 2SIM and 3.1 RP 162)
		Helidecks shall be assessed for structural integrity**/**damage by an engineer to assure conformity with the facility owner plan and any indemnified damages shall be repaired.		Five Years (HSAC RP 162)
2	**Weather Equipment**	Sensors and windsocks shall be positioned in a location that provides the most accurate representation of actual conditions experienced on helideck.		
2.1	Windsock	Replace if fabric is torn or weather-faded.		As Needed
		If windsock supporting frame assembly is not free to rotate 360 degrees. Repair/replace.		As Needed
		If site evaluation determines that the primary windsock is obstructed from clear airflow, install secondary windsock(s) in clear airflow.		As Needed
		If installed on a facility where night or IFR flights are performed and windsock light is inoperative, then replace/repair. See item 3 below.		As Needed
2.2	Weather System, inclusive of Automated Weather Observation System (AWOS)	Perform monthly preventive maintenance on all equipment, see details in APPENDIX 7.		Monthly
2.3	All system sensors	For sensors with lenses, clean lenses using manufacturer recommendations when contaminated. **Note:** improper cleaning can result in damage to lenses.		Daily
		Calibrate and certify.		Annual
		Replace/repair sensor(s) if not accurately reporting.		As Needed
2.4	Pitch, Roll and Heave Sensors (Only for floating facilities)	If readings are not displayed or appear erroneous, troubleshoot system and repair as necessary.		As Needed
		Calibrate and certify.		Annual
2.5	Hand-held Anemometer	Test for proper output per manufacturer requirements.		Annual
		Replace/repair if not reporting accurately.		As Needed

#	Area of Maintenance	Preventive/Corrective Actions	Frequency (Reference)
2.6	AWOS Communications (automated radio and internet relays) and Displays (HLO station and Control Room)	If any of the communications or displays are not properly functioning, repair and return to service.	As Needed
		Verify that the designated communications links for transmitting the weather data are operating properly.	Daily
3	**Lighting System**		
3.1	Perimeter-, flood-, obstruction-, helideck status-, and windsock lights	If lights are dim or burnt out; replace.	Daily
		If lens are crazed, scratched, cracked, etc.; replace	Daily
3.2	Flood Lights	If lights do not properly light the center of the helideck (HSAC RP 161), reorient or relocate the lights.	Daily
3.3	Windsock Lighting	If light does not adequately illuminate the windsock to provide proper visual cue to the pilot; reorient, replace with higher wattage or add additional lighting. **Note:** These lights may be located outside the windsock such as a spotlight on a railing; however glare to pilots shall be prevented.	Daily
3.4	Helideck H and TDPM surface lights (if installed)	If any light strips are crazed or cracked or unserviceable; replace.	As needed
		Verify that the mounting brackets to connect the lights to the deck are tight and that any covers designed to minimize damage to tires are secure and in place. If any discrepancies; repair/replace. **Note:** If the facility is supported with skid-equipped helicopters, this Helideck H and TDPM lighting system shall be evaluated to ensure the design if the hold down system will not damage helicopter skid tubes.	Daily
3.5	Back-up Power or Uninterruptable Power Supply (UPS) for Lighting	Test to verify that at least 50 % of perimeter lighting and 100% of the access and egress routes lights, obstruction lights, helideck status lights, windsock lights and fixed base aviation radios to remain powered and operational when there is a primary power failure. Note – Some facilities do not have the emergency generator/bus designed to operate as noted above and the specified lighting should then be connected to a UPS capable of powering the lighting for a period of at least 18 hours.	Annual
4	**Communications/Navigation**		
4.1	VHF Air Band Radio	Test for proper function on frequency and volume.	Daily
		If any discrepancies; repair/replace.	As Needed

#	Area of Maintenance	Preventive/Corrective Actions	Frequency (Reference)
4.2	Portable VHF Air Band Hand-Held Radios with Headset (1 per helideck team member)	Test for proper function on frequency and volume in headset	Daily
		If any discrepancies; repair/replace	As Needed
4.3	Non-Directional Beacon (NDB - if equipped)	Test for proper function on frequency and proper radio code identifier, and pilot report of proper operation.	Daily
		If not operating properly, repair as soon as possible and notify helicopter operator who issues a NOTAM that the NDB is out of service. Once repaired and in proper operation notify helicopter operator (to revoke NOTAM).	As Needed
		Test for proper operation and power output by a certified technician. Repair if any discrepancies. Certificate provided. Assure NDB information in Helideck Information Plate is correct. Update HIP if necessary.	Annual
5	**Miscellaneous Equipment**		
5.1	Weight Scales	Certified calibration annually. A decal or tag is placed on the scales to indicate next due date.	Annual
		If a certified calibration is not practicable, monthly self-calibration using certified weights is also allowed. **Self-Calibration procedure:** i. A log is present showing date, who checked the weight, weight used to confirm accuracy, variance and signature. ii. If variation from known weight is 0, then scales can continue to be used iii. If variation is other than 0 (+ or -), this is noted on the sheet 1. Need to check if variation is linear by using different known weights across the weight spectrum the scales are approved for. 2. If variation is the same (for example every known weight shows +0.1 lbs. on the scales), this variation can be used to correct manifested weights until the scales are calibrated by an approved organization or until a new calibrated scale has arrived. 3. If variation amount is different across the weight spectrum of the scales (for example: +0.1 lbs. at 15 lbs., +0.3 at 100 lbs. and +0.5 at 250 lbs.), the scales need to be taken out of service and are to be send in for calibration or an new calibrated scale needs to be ordered. **Note:** For sample Aviation Scales Self-Calibration Record see APPENDIX 6	Monthly

#	Area of Maintenance	Preventive/Corrective Actions	Frequency (Reference)
5.2	Prohibited Landing Marker (4x4 meters; red flag with diagonal yellow cross)	Roll-out and install annually as part of helideck team exercise, during which procedures to safely install are practiced and all associated materials for proper installation are serviceable. Inspection can now be performed.	Annually
		Replace if faded or torn.	As Needed
5.3	HLO, HDA & FG Reflective Vests with position title on front and back of vest	**Cleaning/Washing:** Flame resistant (FR) high visibility vest are made from an inherently FR blend of synthetic and natural fiber. These garments must be laundered separately at temperatures not to exceed 140ºF (60ºC) using soft laundry detergent only and may also be dry-cleaned. **Note 1:** Flame resistant garments should be removed immediately and replaced with clean FR apparel if they become soiled with flammable materials. **Note 2:** Wash separately from other garments to avoid damaging the luminescent effect. **Note 3:** Chlorine bleach (sodium hypochlorite) must be avoided. Repeated exposure to bleach can destroy the luminescent effect.	As Needed
		Dry Clean: Either perchloroethylene or petroleum solvent may be used.	As Needed
		Repair & Mending: Minor repairs that do not affect the integrity of the garment may be made with like materials by either heat sealing or sewing on patches or darning small holes.	As Needed
		Replace if faded or worn beyond repair.	As Needed
5.4	HLO, HDA & FG Helmets	If face shields are damaged or crazed, replace **Note:** Standard construction style helmets are unsuitable for helidecks operations. A fire rated helmet with fire rated face shield shall be used.	As Needed
5.5	Helicopter Tie-down straps (Minimum of 4; breaking strength of 12,000 lbs.)	**Cleaning:** Keeping straps clean is the best way to extend working life. Mix a mild detergent with warm water and scrub with a quality scrub brush to loosen any dirt and debris. Avoid bleach-based cleansers or any with acid additives. Hang straps to allow for thorough air-drying.	As needed

#	Area of Maintenance	Preventive/Corrective Actions	Frequency (Reference)
		Replace if visual damage is observed on one of the following items: • Broken stitching in the stitch patterns • Weld splatter, or any areas of melting or charring • Damage caused from UV rays: color looks bleached or webbing feels stiff • Small particles embedded in the webbing • Burnt areas caused by acid, alkali, or other chemicals • Cracks, pits, or corrosion on ratchets, cam buckles, hooks, and other fittings. • Unusual wear patterns of webbing at the point of contact with the fitting • Tag: work load limit information must be visible	As needed
5.6	Video/DVD Player/Computer (with passenger safety video/brief)	Create/Verify backup of Passenger Safety Briefing Video/DVD/File	Annually
		Replace/Repair Video/DVD/Computer used for playback upon failure	As needed
5.7	Fuel Spill Response Kit	Replace/Replenish materials after use or when consumable due date becomes due.	Due Date/ As Needed/ After Use
5.8	Stretchers, suitable for helicopter	**Stretcher cleaning:** When Stretcher has a mattress: Remove the mattress prior to washing the stretcher. Wipe the stretcher with cleaning solution and water per manufacturer's recommended dilution.	After use
		Mattress cleaning (If used): • Hand-wash all surfaces of the mattress with warm water and mild detergent cleaner. • Dry thoroughly. • Apply disinfectant solution either by spray, solution or pre-impregnated wipes (do not soak mattress). • Clean per hospital protocol for mattresses. • Wipe up excess disinfectant. • Rinse with clean water. • Allow surface to dry.	After use
		Any damages, repair/replace as needed.	As needed
5.9	Chocks (Rubber or Sand Bags: Minimum of 6; 2 per aircraft wheel)	Any damages, repair/replace as needed.	As needed
5.10	Helicopter Start Unit (if provided)	Perform maintenance as prescribed by the manufacturer	As Specified

#	Area of Maintenance	Preventive/Corrective Actions		Frequency (Reference)
5.11	Ice and snow removal equipment (if provided)	Any damages, repair/replace as needed.		As needed
6	**Crash Response Equipment**			
6.1	Waterproof & Accessible Crash Box - Minimum of one vertical cabinet with shelves (one by each helideck access point preferred)	If damaged, or doors are difficult to open/close or doors do not secure properly; repair/replace.		As Needed
		Replace inventory list on door interior if missing, damaged or contents have changed for longer term.		As Needed
6.2	Crash rescue tools (one per crash box, unless noted differently):	▪ Adjustable Wrench ▪ Large Rescue Axe ▪ Bolt Cutters ▪ Crow Bar ▪ Heavy Duty Hacksaw with 6 blades ▪ Fire Resistant Blanket ▪ Side-cutting pliers ▪ Set of Assorted ▪ Screwdrivers ▪ Harness Cutting Knife with Sheath (one knife per helideck team member) ▪ Fire Resistant Gloves (minimum of two pairs per helideck crew member) ▪ Life-line (minimum of 5 cm x 15 meters) with metal snap ring at one end with rescue harness ▪ Man-Made Mineral Fibre (MMMF) Filter masks (one per helideck team member)	If upon inspection a tool is considered damaged, heavily soiled or missing; replace/repair as appropriate	Monthly
6.3	Aluminum Ladder (two sections: each section a minimum of 2-3 meters long) in close proximity of helideck stored horizontally.	If damaged, or missing; replace/repair as appropriate		Monthly
6.4	Hook, Grab, or Salving (one) in close proximity of helideck stored horizontally. 4.5 meter two piece oak handle with brass connector.	If damaged, or missing; replace/repair as appropriate		Monthly

Attachment 2 – Helideck Daily Inspection Checklist

Helideck Daily Inspection Checklist																																	
Facility:			**Month:**												**Record on Rear of Form any discrepancies and Actions Taken**																		
Daily Action		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**
1	**Helideck surface**																																
2	**Drains, Tie Down Points**																																
3	**Safety Net/Shelf**																																
4	**Landing Net (if installed)**																																
5	**NDB (if installed)**																																
6	**Fire Fighting, Rescue Equip.**																																
7	**Perimeter, Obstruction, Status, Flood Lights**																																
8	**Adjustable Handrails**																																
9	**Entrance Barriers**																																
10	**Passenger Access**																																
11	**Windsock & Weather Sys**																																
12	**Safety Briefing**																																
13	**VHF Radios, and PPE**																																
14	**Report Discrepancies**																																
Findings Legend: S=Satisfactory, **X**=Unsatisfactory, **N/S**=Not in Service, **N/A**=Not Applicable																																	

1. Check deck area for loose objects, birds, and free of oil or fuel spill. Clean the deck if necessary. Check for raised or loose panels, etc. that could snag landing gear
2. Assure gutter drains are open. Remove any material that may plug the drains. Tie-down points remove trapped water if present.
3. Check to ensure netting is secure and not damaged, Check to ensure no netting is elevated above helideck edge
4. Check the landing net. Check the center cannot be lifted upwards more than 10".
5. Check the antenna for damage. Verify NDB is in operation
6. Assure Fire Fighting and Rescue Equipment is ready for operation.
7. Check that all lights function, including surface lights (if installed) for the H and Touch Down/Positioning Marking (Aiming Circle).
8. Check that the collapsible handrails function. If "raised" handrails are used, lay them down before arrival and departure of helicopters.
9. Assure plastic chains/barriers, used to control the helideck entrance staircases are not in use, and are serviceable.
10. Assure passenger access and Emergency Escape access ways are open and that all signs are in order.
11. Check windsock condition and lights (if lighted). Check all other weather equipment for proper operation and readings
12. Check Safety Signs. Pax briefing video media and media player condition
13. Check VHF Radios both fixed base and portable for proper operation. Verify reflective vests, protective eyewear, helmets, etc are available.
14. Review discrepancies reported to OIM, Helicopter Operator notified, and Action List maintained until closed

Attachment 3 – Helideck Monthly Inspection Checklist

Helideck Monthly Inspection Checklist		
Location:		
Inspector:	**Signature:**	**Date:**
Additional Remarks:	☐ Check here; use back for comments.	

#	Area Of Inspection	Remarks	✓If OK	Reference
1	**GENERAL INFORMATION**			
1.1	**Name of Installation/Vessel/Facility**	**Contact Name:**	**Phone:**	
2	**In addition to items completed on Daily Inspection for this date:** Include a review of the overall condition of the facility and the supporting equipment, fire and rescue equipment, condition of the friction of the deck, paint condition, and ongoing maintenance of complex system such as fuel and fire suppression.			
2.1	**Helideck Surface**	Check surface area for friction adequacy, any bare areas or areas of reduced friction; note accordingly. Clean as necessary.	☐	RP 163, Appendix 3, Attmnt 1 – 1.5, 1.2
2.2	**Helideck Markings**	Verify legibility, clean if necessary.	☐	RP 163, Appendix 3, Attmnt 1, Item 1.2
2.3	**Weather System**	Verify all equipment operates properly. Verify that display readouts appear to be accurate. Complete Monthly Weather System Maintenance (APPENDIX 7)	☐	RP 163, Appendix 3, Attmnt 1, Section 2
2.4	**Helideck Team Equipment**	Verify all helideck team equipment is serviceable and available (Helmets, vests, communications radios, etc.)	☐	RP 163, Appendix 3, Attmnt 1, 5.3, 5.4
2.5	**Helideck Supporting Equipment**	Verify all support equipment is available and serviceable (chocks, tiedown straps, stretchers, weighing scales, prohibited landing marker, etc.)	☐	RP 163, Appendix 3, Attmnt 1, 5.5, 5.2, 5.8-. 5.10
2.6	**Fuel System, if installed**	Complete or verify that Monthly Maintenance has been completed.	☐	RP 163, Appendix 4, Attmnt 4
		Check Fuel Spill Response kit for contents.	☐	RP 163, Appendix 3, Attmnt 1, 5.7
2.7	**Helideck Team Training**	Complete and record Monthly Helideck Team emergency response training	☐	RP 163, 9.1.1

#	Area Of Inspection	Remarks	✓If OK	Reference
2.8	**Fire Fighting and Rescue Equipment**	Complete monthly inventory or verify inspection seal is still intact on Rescue Equipment locker, Verify locations, availability and state of emergency ladder and grab hook	☐	RP 163, Appendix 3, Attmnt 1, Section 6
2.9	**Fire Fighting System**	Fire extinguishers, etc: verify the monthly inspection tags have been marked, are not due for maintenance, and pressure gauges are still in green arc. Foam monitors, if installed: check that they can be rotated easily. Foam hand branches and hoses: verify serviceability, no cracking, weather checking, etc. For foam induction equipment, verify that settings of adjustable inductors, if installed, correspond with the strength of concentrate in use. If they do not match, adjust the setting as necessary or replace the foam concentrate with concentrate that can be used with the inductor setting.	☐	RP 163, Appendix 5

REPORT AND ACTION DISCREPANCIES IF ANY:

#	Discrepancy	Action Taken
1		
2		
3		
4		
5		
6		

Attachment 4 – Helideck Initial or Annual Inspection Checklist

Helideck Initial or Annual Inspection Checklist			
Installation Name:		**Type Facility:**	
Fuel System:	☐ Yes/☐ No	**Location:**	
Name of Inspector:		**Date of Inspection:**	

References: The inspection specifications incorporate requirements from the following:

1. ICAO ANNEX 14 VOL II (referenced as ICAO)
2. ICAO Heliport Manual Part 1 Offshore, Document 9261 (referenced as HM)
3. UK CAP 437 (referenced as CAP)
4. HSAC RPs 161, 162, 163, 164 and the HSAC Helideck Design Table provides all required dimensions, weights, obstacle heights, etc required in RPs 161 and 162 based on the helicopter type in use or planned for use. All located at the HSAC.org web site. *http://www.hsac.org/library*
5. Industry Best Practices (referenced as BP)

1. Use of This Checklist: This checklist was developed primarily using HSAC RP 161 for "New Build" Helidecks built after May 2016, for older "Legacy" Helidecks that do not meet the criteria of RP 161, and where there are differences it is noted in this checklist, and RP 162 will need to be used in those cases. For variances from RP 161, instructions on a Risk Assessment and documentation of the variances are contained in RP Nbr 162 Section 3.

2. Pre-Audit Checklist: Attachment 5 is a short Helideck Pre-Audit Checklist that can be sent to the owner/fabricator of the helideck prior to the Helideck Inspection to reduce time reviewing documents, etc during the actual inspection.

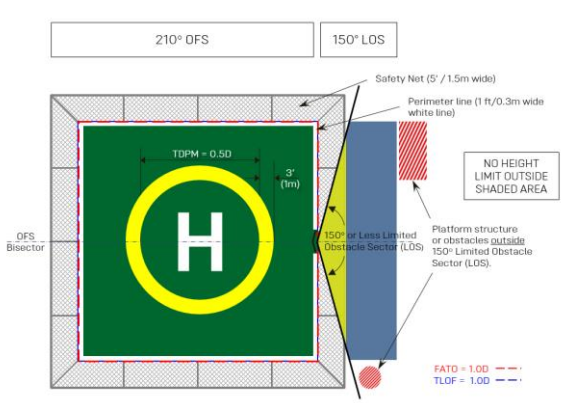
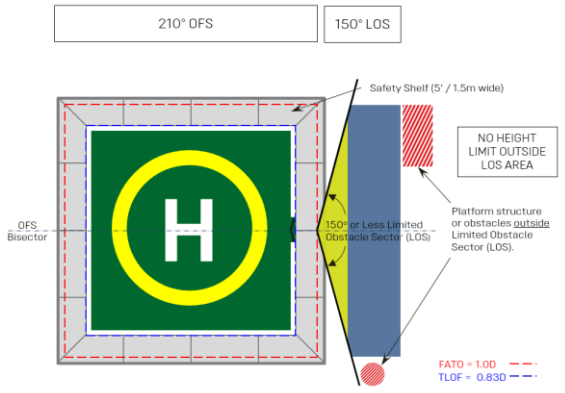
3. Differences in Reference Criteria for Floating Facilities, Vessels, and MODUs: There are some variances for helideck design criteria (helideck size, markings, lighting, etc.) in some countries/associations (ABS, IMO, etc) that have their own specific helideck guidance; for these facilities the appropriate reference should be reviewed when inspecting these facilities in addition to guidance in the HSAC RPs.

4. Non-Conformities: Record each non-conformity at the end of the report with a row number and summarize at the end of the checklist.

5. Inspection Requirements: Results recorded and retained for 2 years, discrepancies (listed at end of report) remedied.

Item	Specification		Reference and Comment or ✓if OK
1	**HELIDECK DRAWINGS, DOCUMENTS AND REPORTS** (if available)		
1.1	A complete set of scale drawings showing, but not limited to, the following:		BP
	1) General arrangement of the entire Platform/Rig/Vessel with detailed drawing of all helideck fittings, painting, lighting, egress points, and markings.		
	2) Elevation–Clearly showing the installation equipment above helideck level and its relationship to the Limited Obstacle Sector (LOS) and Obstacle Free Sector (OFS).		
	3) Elevation–Clearly showing the installation equipment below helideck level and its relationship to the OFDS.		
	4) Plan view of helideck with overlays showing the LOS, OFS, and OFDS.		
	5) Wind tunnel testing studies or Computational Fluid Dynamics (CFD) studies for gas discharges, turbulence, etc., inclusive of prevailing winds to platform orientation.		
	6) Parking areas (if provided) with detailed drawing of all parking area fittings, painting, lighting, egress points, and markings.		
	7) Helideck orientations to be shown using Direction of True North and Magnetic North Direction and with prevailing wind in degrees magnetic if a fixed or moored facility.		
1.2	Detail to be shown shall be as follows:		
	1) Helideck dimensions	2) Refueling system (if installed)	
	3) All helideck markings, giving dimensions and colors	4) Guttering and drainage system	
	5) Helideck landing net location (if installed) and tie-down points	6) Normal and emergency personnel access points	
	7) Perimeter safety net/shelf size and supports	8) Windsock(s)	
	9) Lighting: perimeter, floodlighting, status, and obstruction	10) Structures that might cause turbulence over the helideck	
	11) Location and type of helideck firefighting and crash rescue equipment	12) Hot emission sources, e.g., flares, turbine exhausts	
	13) Cold emission sources, e.g., vents, blowdown	14) 210° OFS, 150° LOS & 180° OFDS sectors to be clearly shown	
	15) Height of helideck above MSL (mean operating draft)	16) All obstruction non-compliances to be detailed, stating height above/below deck level	
1.3	The following reports shall be provided (either original or current version)		BP
	1) Helideck Commissioning Report and last helideck inspection report with record of actions taken to close discrepancies		

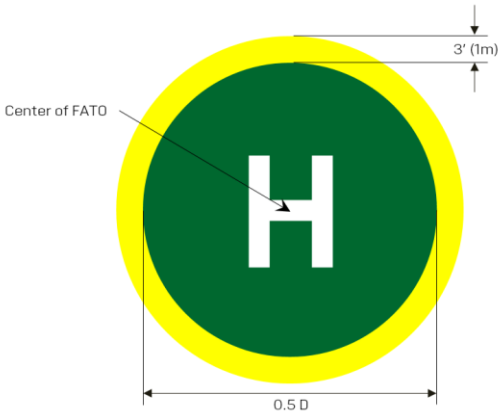
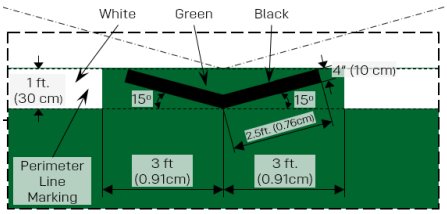
Item	Specification	Reference and Comment or ✓if OK
	2) Results of Finished Foam Test and Fire Fighting System Commissioning	
	3) Fuel System Commissioning and last inspection report	
	4) Lighting Arrangement Commissioning and Serviceability	
	5) Weather System Calibration	
	6) Weighing Scales Calibration	
	7) Friction Test Certificate	
	8) If safety netting in chain link style, Load Test Certificate	
1.4	The following documents shall be provided:	RP 163 Par 7.2; RP 164
	1) Helideck Operations Manual (HOM)	
	2) Helideck Information Plate (HIP) see RP 164	
	3) Helideck Risk Assessments:	
	a) Initial and five-yearly for the helideck and associated systems	
	b) Variances from RP 162 for legacy helidecks, as necessary	
	c) Firefighting Assessment, five-yearly	
	d) Emergency Response Assessment, initial	
	4) Structural Assessments:	
	a) Structural Integrity Assessment completed every 5 years	
	b) Incident Assessments of damages, as events occur	
	5) Manual/Matrix of Permitted Operations (MOPO)	
	6) Facility Maintenance Manual	
	7) Helideck Daily Status Form Report	
	8) Daily, Monthly and Annual Helideck Checklists/Reports	
	9) Daily, Monthly, Quarterly, Six-Monthly, and Annual Fuel System Checklists/Reports	
	10) Helideck Team Emergency Response Drill reports/records	
	11) Helideck Team Members, Weather Observers, and Fuel Handler Training/ Qualification/ Competence Records	

Item	Specification	Reference and Comment or ✓if OK
2	**HELIDECK DIMENSIONS**	
2.1	**Main Landing Area**	
	 	
2.1.1	The overall helideck dimensions shall be at least equivalent to the 0.83D value of the largest helicopter certified for use. The HSAC Web Helideck Design Data Table shows the "D" value for commonly used helicopters. *http://www.hsac.org/library* **Note:** For "Legacy" helidecks that are less than 0.83D, refer to RP 162 and conduct an Assessment and have it available for reference.	RP 161 Par 4.3.2 D Value of Helicopter: D Value of Deck:
2.1.2	Dimensions : ☐ US (feet) ☐ Metric (meters) / Length: / Width:	Shape:
2.1.3	Surface area is free of excessive contamination (bird droppings, oil, etc.)	☐ Yes/☐ No
2.1.4	Surface area free of any loose objects	☐ Yes/ ☐ No
2.2	**Parking Area (PA)** (if provided)	
2.2.1	The parking area shall have a size equivalent to the "D" value of the largest helicopter approved for the helideck. Less than "D" value size may be used if RP 161 guidance is followed (Limited Parking Area or Push-in Parking Area).	RP 161 Par 4.3.4.4 D Value of PA:
2.2.2	For helicopters with folding blades, the parking area may be predicated on the maximum overall length and width of the helicopter with the blades folded.	Applicable? ☐ Yes/ ☐ No
2.2.3	The minimum distance of the parking transition area between the edge of parking area and the edge of the landing area is 0.33D based on the design helicopter.	RP 161 Par 4.3.4.9 0.33D PTA? ☐ Yes/☐ No/☐ NA
2.2.4	The parking area and parking transition area shall be marked as prescribed in the RP 161.	RP 161 Par 4.3.4 ☐ Yes/☐ No/☐ NA

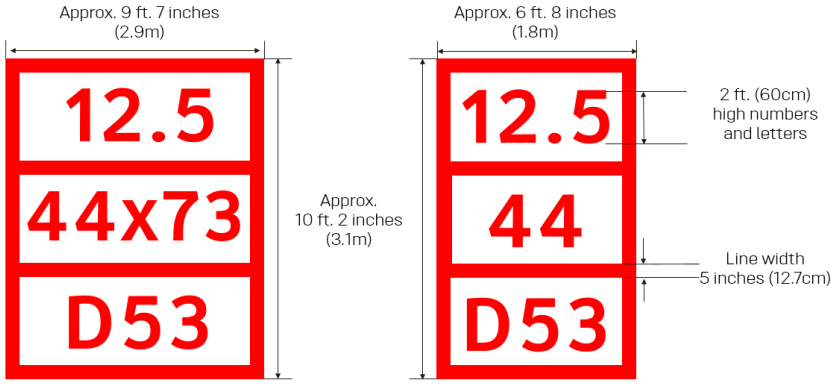
Item	Specification	Reference and Comment or ✓if OK
2.3	**Final Approach and Take Off Area (FATO) and Touchdown and Lift Off Area (TLOF)**	
2.3.1	The TLOF shall incorporate a circle with diameter at least equal to the 0.83D value of the helideck. (1.0D is preferred) Shall equal the D value in 2.1.1. **Note:** For "Legacy" helidecks that are less than 0.83D, refer to RP 162 and conduct an Assessment.	RP 161 Par. 5.3.2 D Value:
2.3.2	The TLOF shall not include the PA and the PA shall be outside the OFS	RP 161 Par. 5.3.4 ☐ Yes/☐ No/☐ NA
2.3.3	For a TLOF less than 1.0D, a solid safety shelf shall be provided instead of a safety net.	RP 161 Par. 5.3.2 ☐ Yes/☐ No/☐ NA
3	**HELIDECK SURFACE**	
3.1	**Color**	
3.1.1	The helideck surface type (steel, aluminum, or safe deck) incorporated inside the TLOF and the parking area, if provided, shall be dark green. Color: Surface Type:	RP 161 Par. 7.12
3.1.2	Aluminum helidecks need not be painted provided the helideck markings are highlighted in black.	RP 161 Par. 7.12 Markings Highlighted? ☐ Yes/☐ No/☐ NA
3.2	**Nonslip Characteristics**	
3.2.1	The helideck surface, including painted markings, shall have a non-slip surface in both dry and wet conditions.	RP 163 Par. 7.3.1 Non-Skid surface? ☐ Yes/☐ No
3.2.2	For aluminum helidecks, non-slip coatings shall be applied unless adequate friction properties have been designed into the construction.	RP 163 Par. 7.3.1 Non-Skid surface? ☐ Yes/☐ No
3.2.4	The helideck surface shall meet minimum friction coefficients of not less than 0.65mu for the entire TLOF and inclusive of markings. A periodic friction test certificate shall be provided. Date of last certification:	RP 163 Par. 7.3.1; Appendix 3, Attmnt 1 item 1.5 Minimum Friction Coefficient:
3.2.5	A friction rating of 0.5mu is acceptable for entire surface of installations with a helideck landing net fitted. The fitting of helideck landing nets shall not negate the need for non-skid coatings. See section 5 below for more details.	RP 163 Par. 7.3.1 and 7.3.2 Landing Net required? ☐ Yes/☐ No

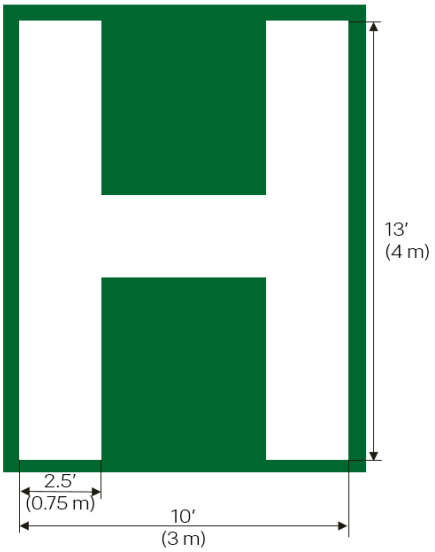
Item	Specification	Reference and Comment or ✓if OK
3.2.6	For cold weather environments provision for a heated helideck should be evaluated. Is helideck heated?	RP 161 Par. 5.1 ☐ Yes/☐ No
3.3	**Gutter**	
3.3.1	The complete helideck, including the Touchdown and Lift Off Area (TLOF) and parking area, where provided, shall be encompassed by a drainage system.	RP 161 Par. 5.5.3 ☐ Yes/☐ No
3.3.2	The drainage system/gutter in front of all normal and emergency access points and any other access to the helideck (e.g., from firefighting landings) shall have anti-trip mesh grating to cover the top of the gutter.	RP 163 Par. 9.12.1 Note 2 ☐ Yes/☐ No
3.4	**Slope**	
3.4.1	The slope shall not exceed 2 percent in any direction.	RP 161 Par. 5.5.3 ☐ Yes/☐ No
3.5	**Drainage**	
3.5.1	The drainage system shall be capable of containing the maximum likely fuel spillage of a typical fuel load for the helicopter type to be used plus fire extinguishing media.	HM 3.5.2.1/RP 161 Par. 5.5.3 ☐ Yes/☐ No
3.5.2	Each side of the helideck gutter shall incorporate at least two drains.	BP ☐ Yes/☐ No
3.5.3	If not required by regulation, the final drain may discharge overboard at a position close to the sea but isolated from any installation sea water intake areas.	HM 3.5.2.1/BP ☐ Yes/☐ No/☐ NA
3.5.4	The gutter drains shall be covered with debris grilles	RP 161 Par. 5.5.3 ☐ Yes/☐ No
3.5.5	Tie-down points will have a provision to prevent collection of fluids. See 3.6 below **Note:** A hole in the tie-down cup that drains to a lower deck is not acceptable unless the drainage is directed into an enclosed system, as this would create a major hazard during fuel spill and/or fire on the helideck.	RP 161 Par. 5.5.3 ☐ Yes/☐ No
3.5.6	The drainage system can be a totally enclosed system designed to minimize access to oxygen and therefore minimize chances of combustion and fire.	RP 161 Par. 5.5.3 System enclosed? ☐ Yes/☐ No
3.5.7	Drainage systems shall provide containment of any fuel spillage for facilities that have a fuel system. Drainage and containment for the fuel system provided?	RP 161 Par. 5.5.3 ☐ Yes/☐ No/☐ NA
3.5.8	A diverter valve may be provided in the drainage system to temporarily disallow rain water diversion during flight operations. Diverter valve provided? ☐ Yes/☐ No	RP 161 Par. 5.5.3 If yes, closed during helo operations? ☐ Yes/☐ No

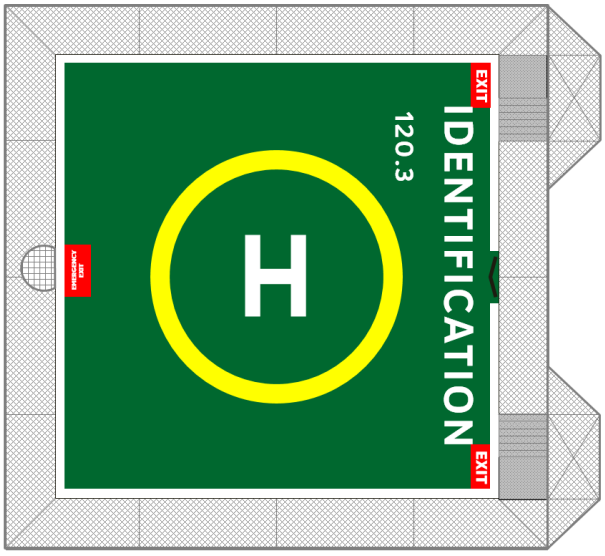
Item	Specification	Reference and Comment or ✓if OK
3.6	**Tie-Down Points**	
3.6.1	Tie-down points should be recessed, may be equipped with covers that do not present a flyaway hazard, and have adequate side wall clearances to allow straps to be attached.	RP 161 Par. 6.7 ☐ Yes/☐ No
3.6.2	The number of tie-down point circles on the figure should be used relative to the size of the TLOF and should be concentric to the "H" marking	RP 161 Par. 6.7 ☐ Yes/☐ No
3.6.3	The maximum diameter or thickness of the tie-down bar attachment point should be 1.0 in. (2.5 cm) and should be of sufficient thickness to maintain adequate security of the helicopter.	RP 161 Par. 6.7 ☐ Yes/☐ No
3.6.4	There shall be adequate tie-down points to secure the largest-size design helicopter for the helideck.	RP 161 Par. 6.7 ☐ Yes/☐ No
3.6.5	The minimum number of tie-down points is 6. For helideck smaller than 40 ft., eight tie-down points instead of six should be considered to allow a parked helicopter to be reoriented for maintenance purposes, etc.	RP 161 Par. 6.7 ☐ Yes/☐ No
3.6.6	Tie-down straps shall be compatible with tie-down points.	RP 161 Par. 6.7 ☐ Yes/☐ No
4	**HELIDECK MARKINGS**	
4.1	**Installation/Rig Name**	
4.1.1	The TLOF should be marked with a facility identification (name or block number) marking and designated radio frequency.	RP 161 Par. 7.11 ☐ Yes/☐ No
4.1.2	The facility identification (name) should be marked on the TLOF surface between the perimeter of the TLOF where the chevron is depicted and the TDPM in letters and/or numbers of not less than 3 ft. (1.0 m) high and in a color (normally white) which contrasts with the helideck surface. Color: ☐ Width: ☐	RP 161 Par. 7.11 Identification Marking? ☐ Yes/☐ No
4.1.3	The radio frequency should be marked in the upper left (between identification marking and 'H' outside of the TDPM) in numbers and letters of 2 ft. (0.6 m) and the same color as the identification marking. Color: ☐ Width: ☐	RP 161 Par. 7.11 Radio Frequency Marking? ☐ Yes/☐ No
4.1.4	Identification and radio frequency markings should be oriented so they can be seen and read for verification during a pre-landing orbit.	RP 161 Par. 7.11 ☐ Yes/☐ No
4.1.5	On aluminum decks, the conspicuity of the markings are enhanced by outlining those markings with a 6 in. (15 cm) cm line in a contrasting color or by overlaying white or yellow markings on a black background.	RP 161 Par. 7.12 ☐ Yes/☐ No
4.1.6	A surface landing net, when fitted, shall not cover the installation name and radio frequency. See section 5 below	RP 163 Par. 7.3.2 ☐ Yes/☐ No/☐ NA

Item	Specification	Reference and Comment or ✓if OK
4.1.7	Where several installations bearing similar names are located in close proximity, each shall have a distinctive identifier name	RP 163 Par. 7.4 Note 4 ☐ Yes/☐ No
4.2	**Perimeter Line**	
4.2.1	The perimeter line shall delineate boundary of the Touchdown and Liftoff Area (TLOF) and should be a 12 in. (30 cm) wide solid white line.	RP 161 Par. 7.2 Perimeter Line?
	Color: ☐ Width: ☐	☐ Yes/☐ No
4.3	**TouchDown Positioning Marking (TDPM)**	
4.3.1	The TDPM shall be painted yellow and located based on the center of the TLOF/FATO Note: It is possible to offset the TDPM by max. 0.1D, see RP 162 Assessment process and markings. 	RP 161 Par. 7.3 TDPM? ☐ Yes/☐ No
4.3.2	The TDPM is a yellow circle with an inner diameter of 0.5D (i.e. radius of 0.25D) and a line width 3 ft. (1 m). **Note 1:** The conspicuity of the yellow TDPM may be enhanced by outlining the marking with a black line with width of 4 in. (10 cm). **Note 2:** For "Legacy" helidecks that are less than 0.83D or helidecks that do not meet RP 161 requirements, differing TDPM requirements may be required, refer to RP 162 and conduct an Assessment.	Color: ☐ Width of line: ☐ Inner diameter of TDPM: ☐
4.4	**Obstacle Free Sector (OFS) Chevron**	
4.4.1	A helideck obstacle-free sector (OFS) marking, a chevron, should be located on the FATO perimeter: unless the TLOF is the same size as the FATO this will not be on the perimeter of the TLOF. 	RP 161 Par. 7.7 Appropriately Located: ☐ Yes/☐ No

Item	Specification	Reference and Comment or ✓if OK
	Note 1: Placing the chevron marking on the FATO perimeter line will actually displace the apex of the chevron approximately 1 foot from the outer edge of the FATO perimeter where the reference point of the OFS and LOS actually begins. Thus the actual placement of allowable obstacles begins at the LOS reference and not at the apex of the chevron as depicted on the actual LOS chevron marking. **Note 2:** The actual OFS reference point/point of origin will in most cases be located on the safety shelf for sub 1.0D helidecks. **Note 3:** Legacy helidecks may have alternative OFS requirements, see RP 162.	
4.4.2	The chevron should subtend an angle of 210 degrees, which delineates the OFS/LOS boundary. Angle:	RP 161 Par. 7.7, 5.3.5.2
4.4.3	The chevron should be marked in black color on the FATO surface, or a contrasting background Color:	RP 161 Par. 7.7
4.4.4	Each leg of the chevron should be a minimum of 2.5 ft. (0.76 m) long and 4 in (10 cm) wide, forming an angle that indicates the direction of the limits of the sector. Width of leg: ____ Length of leg: ____	RP 161 Par. 7.7
4.4.5	Where there is no room to place the chevron on the edge of the FATO or the FATO edge is non-load bearing (i.e. not a solid surface), the chevron marking, but not the reference point/point of origin, may be displaced towards the FATO center: the distance displaced should be indicated. The marking should be a black box (thin black line) around the black wording "WARNING DISPLACED CHEVRON *X.X* ft. (*Y.Y* m)" where *X* is the displaced distance. **Note**: On helidecks where there are no obstacles for 360º, no chevron is required. Displaced Chevron? ☐ Yes/☐ No Appropriately Located? ☐ Yes/☐ No	RP 161 Par. 7.7 Correct Warning? ☐ Yes/☐ No
4.4.6	The chevron may be swung +/-15 degrees to accommodate installation obstacles. See 4.6.3 below	RP 161 Par. 4.3.2.3, 5.3.2, 7.4 Complies with 4.6.3 below? ☐ Yes/☐ No
4.5	**"D" Values, Max Allowable Mass, and TLOF Dimensions**	
4.5.1	The TLOF should be marked to indicate the design weight (mass), TLOF dimensions and D-value limitations in a box, outlined in red, in red numerals on a white background.	RP 161 Par. 7.6 Three tiered box used? ☐ Yes/☐ No

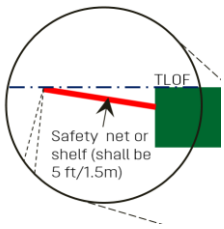
Item	Specification	Reference and Comment or ✓if OK
	Note 1: These dimensions should not include the safety net or solid safety shelf. **Note 2:** The recommended method of designating the helideck (TLOF) limitations is to indicate the maximum design load and the design D-value, together with the actual TLOF size in a three-tiered box. **Note 3:** The weight/size limitation and the actual TLOF size box marking should be visible from the principal direction of approach and oriented in the same direction as the helideck name. **Note 4:** For legacy decks, the boxes may be required to be reduced in size and location, see RP 162	
		
4.5.2	The size of a non-rectangular (i.e. square, octagonal, hexagonal, pentagonal, or circular) TLOF should be indicated by a single number representing the diameter of the largest circle which can be contained within the TLOF.	RP 161 Par. 7.6 Non-rectangular TLOF?
	Non-rectangular TLOF Size Marking:	☐ Yes/☐ No/☐ NA
4.5.3	Dimensions of rectangular TLOFs should be indicated by the length (*L*) times the width (*W*) where *L* is measured from the TLOF edge marked with the chevron to the opposite TLOF edge and W is measured between the TLOF edges perpendicular to the *L* measurement.	RP 161 Par. 7.6 Rectangular TLOF?
	Rectangular TLOF Size Marking: *L*	X *W*	☐ Yes/☐ No/☐ NA
4.5.4	The maximum design load of the helideck should be indicated in terms of 1,000 lbs. by a two or three digit number with one decimal point rounded down to the nearest 100 pounds i.e., 15,675 lbs. should be marked as "15.6". **Note:** A helideck with a 15,000 lbs. design load should be marked as "15.0" and not "15"	RP 161 Par. 7.6 Max Load Marking: Rounded to Nearest 100#? ☐ Yes/☐ No

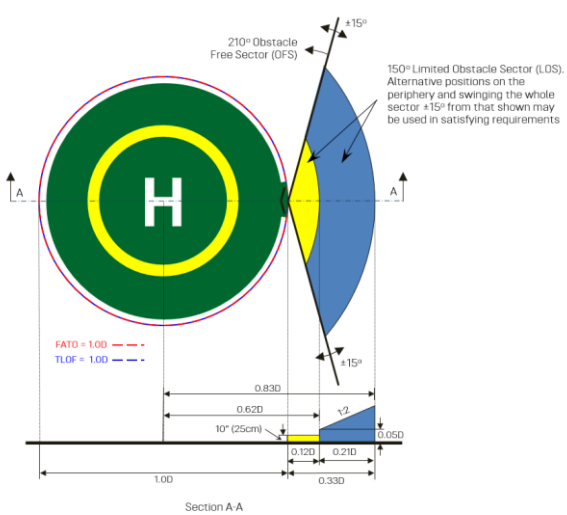
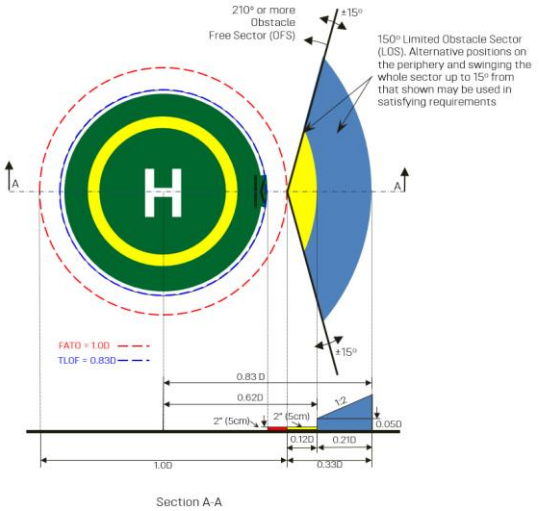
Item	Specification	Reference and Comment or ✓if OK
4.5.2	The height of the numbers and letters should be 2 ft. (0.6 m) with the line width of the box and the minimum separation between the numbers/letters and the frame of box, approximately 5 in. (12 cm). For smaller helidecks (less than 40 ft. [12 m]) where space may be limited, the height of the figures may be reduced to 18 in. (45 cm). The width of the box will depend on the actual numbers since although the height is defined the width varies depending on the actual number. Note: For legacy decks, the H may be required to be smaller, see RP 162	RP 161 Par. 7.6 Height of Numbers:
	Color Numbers:	Color Background	Color Outline:
4.5.5	Where metric units are used instead of imperial, see RP 161 Par. 7.6.3 for recommended markings.	RP 161 Par. 7.6.3
4.6	**Heliport Identification Marking – "H"**	
4.6.1	The "H" shall be in the center of the TDPM and its center shall lie on the bisector of the OFS. 	RP 161 Par. 7.4 Located in TLOF center? ☐ Yes/☐ No Located on bisector of the OFS? ☐ Yes/☐ No
4.6.2	The marking consists of the letter "H", 10 ft. high × 6 ft. wide (3 m × 1.8 m) painted white. The width of the legs and the cross bar of the "H" should be 16 in (40 cm). Note 1: The "H" may be outlined with a 6 in. (15 cm) wide line of a contrasting color to enhance conspicuity. Note 2: for legacy decks the size of the "H" may be reduced if the helideck if less than 0.83D, See RP 162 and conduct an Assessment.	RP 161 Par. 7.4 Width of line: Color:
	Length of H:	Width of H:	
4.6.3	If the OFS and the LOS are swung (by up to maximum 15º) from the norm, the bisector of the OFS need not lie on crossbar of the "H" and the "H" shall also be swung (rotated) by a corresponding amount, but should remain in the center of the TLOF. The "H" crossbar should remain in the center of the FATO/TLOF and parallel to the bi-sector of the OFS.	RP 161 Par. 4.3.2.3, 5.3.2, 7.4 H Centered:?
	Swing degrees:	☐ Yes/☐ No

Item	Specification	Reference and Comment or ✓if OK
4.7	**Prohibited Landing Sector**	
4.7.1	On a helideck where the number of personnel access points is limited, a "No Nose" prohibited landing heading sector marking may be used to avoid placing the tail rotor in close proximity to the stairs, etc.	RP 161 Par. 7.9 Required? ☐ Yes/☐ No
4.7.2	When safe use of exits due to positioning of the helicopter on the deck might be impaired, the sector of the TDPM, opposite from the personnel access points should be bordered in the color red, with the words "No Nose" clearly marked in red, on a white background. Color background:	RP 161 Par. 7.9 Color letters and border:
4.7.3	The minimum prohibited 'No Nose" marking sector should be 30º on the TDPM.	RP 161 Par. 7.9 Length in Degrees:
4.8	**Personnel Exits, Markings, Signs**	
4.8.1	Exits shall be identified with a red "EXIT" box on the perimeter line. This box should be 4 ft. (1.2 m) wide by 2 ft. (0.6m) high with the word EXIT with 6 in. (15 cm) high white lettering. 	RP 161 Par. 7.13 Letter color: Background color: Size of Box? Length: Width:
4.8.2	Exits that provide egress by ladder shall be marked as "EMERGENCY EXIT." Using the dimensions and colors noted above. Length Width:	RP 161 Par. 7.13 Letter color: Background color:
4.8.3	For manned facilities, a walkway marking is optional. For NUIs, a walkway/direction marking to the exit, should be painted on the helideck surface, although it should be noted that this may present a hazard for single egress decks if the pilot is forced by wind direction to land with the tail rotor close to this marked walkway.	RP 161 Par. 7.14 Walkway Marking? ☐ Yes/☐ No Width:

Item	Specification	Reference and Comment or ✓if OK
	The walkway markings 3 ft. (1.0 m) wide shall start 1 ft. (30m) from the TDPM and it should be marked in a color that contrasts with the surface, such as white. Yellow should not be used. **Note:** Emergency exits shall not have painted walkways.	Color:
4.8.4	Signage and Visual Aids for Access and Emergencies: Signage and visual aids should be visible, clean, and in working order to direct passengers and personal to safe transition areas and muster points, if needed.	RP 163 Par. 9.12.1 Note 1 Signs provided and legible? ☐ Yes/☐ No
4.9	**Obstruction Markings**	
4.9.1	Fixed obstacles which present a hazard to flight operations shall be readily visible from the air. Any obstacles that present a flight hazard?	RP 163 Par. 7.4.1.1.a ☐ Yes/☐ No
4.9.2	If a paint scheme is necessary to enhance identification by day, alternate black and white, black and yellow, or red and white bands are recommended, not less than 1.5 ft. (0.5 m) nor more than 20 ft. (6 m) wide. The use of "Day-Glo" orange bands may also be acceptable. Obstacles to be marked in these contrasting colors include any lattice tower structures and crane booms, in addition to obstacles which are close to the helideck or the LOS boundary, like antennas, vents, etc. Similarly, parts of the leg or legs of jack-up units adjacent to the helideck area which extend, or can extend, above it should also be marked in the same manner. Lattice towers should be painted in their entirety. **Note:** Alternative conspicuous color paint schemes should be considered for clearly differentiating the vent pipes or flare piping, etc. in the vicinity the helideck from its surroundings/environment, especially on smaller legacy helidecks.	RP 163 Par. 7.4.1.1.b Obstacles painted? ☐ Yes/☐ No Correct width of bands? ☐ Yes/☐ No Color of bands: Clearly marked and conspicuous? ☐ Yes/☐ No
4.9.3	Where obstacles infringing the OFDS (below the helideck) have been accepted by both the owner and helicopter operator, the white perimeter line shall be overlaid by hatched yellow and black diagonal bands 8 in. (20 cm) wide to mark the area defining the width of the obstacle below deck level being depicted plus 12 in. (30 cm) on each side. See Figure 7.4.2.2 in RP 163.	RP 163 Par. 7.4.1.1.c OFDS infringements properly marked on the perimeter? ☐ Yes/☐ No/☐ NA
4.10	**Handrails**	
4.10.1	Handrails which are retractable, collapsible or removable should be painted or marked using other visual materials in contrasting (preferably black and yellow) color scheme. Handrails when folded down shall not block use of the stairs/exits.	RP 161. 5.3.5.2, 5.3.5.5, 5.4 Handrail markings: ☐ Yes/☐ No/☐ NA

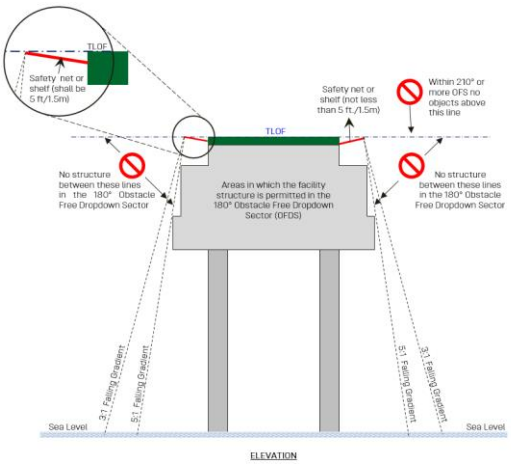
Item	Specification				Reference and Comment or ✓if OK
5	**SURFACE LANDING NET**				
5.1	**Requirements**				
5.1.1	Landing nets may be used for floating facilities that may be subject to significant pitch, roll, and heave movements. Landing nets are not required on fixed installations that have adequate surface friction coefficient (>0.5μ), no movement and which are not subject to ice or snow.				RP 163 Par. 7.3.2 Landing net required? ☐ Yes/☐ No
5.1.2	Tautly stretched netting is required for wheeled undercarriage helicopters in adverse cold climates and for wheeled aircraft operating on floating or mobile installations.				RP 163 Par. 7.3.2 Net required?
	Adverse cold climate:	☐ Yes/☐ No	Floating facility:	☐ Yes/☐ No	☐ Yes/☐ No
5.1.3	The grid size, area, and number of securing points shall be determined with due consideration given to the largest helicopter the helideck is designed to accommodate.				RP 163 Par. 7.3.2
	Required Net Size:		Nbr Securing points:		
5.1.4	Landing nets are recommended when the landing surface friction is below 0.65μ. See 3.2.5 above for further details.				RP 163 Par. 7.3.2 Friction rating: Net required? ☐ Yes/☐ No
5.1.5	For helicopters with skid landing gear, landing nets shall not be fitted for either fixed or mobile installations.				RP 163 Par. 7.3.2 Note Skid helos in use? ☐ Yes/☐ No
5.2	**If Required**				
5.2.1	The material shall be 0.8 in. (20 mm) diameter sisal or authority-approved alternative nets (FricTape, Helimesh, etc) meeting the specifications of UK CAP 437, with a maximum mesh size of 8 in. (200 mm). The intersections shall be knotted. Note: Polypropylene shall not be used.				CAP 437 Ch. 3-3.45: RP 163 Par. 7.3.2 Manufacturer Life: Age of landing net:
	Type Material:		Manufacturer:		
5..2.2	The net shall cover the TDPM and H, but shall be clear of the installation identification name, radio frequency and three-tiered box markings.				RP 163 Par. 7.3.2
	Covers TDPM?	☐ Yes/☐ No	Clear of other markings?		☐ Yes/☐ No

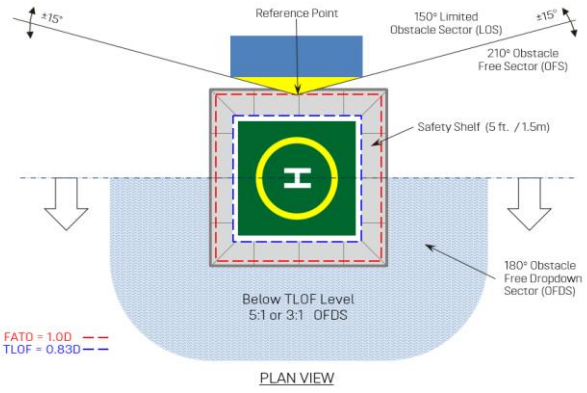
Item	Specification	Reference and Comment or ✓if OK
5.2.3	The net size shall conform to the largest helicopter approved for the helideck. Net size: ☐ Yes/☐ No Appropriate for helicopter in use?	RP 163 Par. 7.3.2 ☐ Yes/☐ No
5.2.4	The net shall be tensioned so that it shall not be possible to raise any part of the net by more than approximately 10 in. (250 mm) above the helideck surface when applying a vigorous vertical pull by hand.	RP 163 Par. 7.3.2 Lift test ok? ☐ Yes/☐ No
5.2.5	The net shall be secured every 5 ft. (1.5 m) around the landing area perimeter and tensioned to at least 2225N.	RP 163 Par. 7.3.2 Distance between straps:
6	**PERIMETER SAFETY NET or SHELF**	
6.1	**Requirements**	
6.1.1	The helideck should be fitted with a safety net or safety shelf for protection of personnel 5 ft. (1.5 m) wide (measured horizontally) around the perimeter, and around stairwells where the safety net or safety shelf should surround the entire opening. **Note:** Safety shelves shall be provided in lieu of or in combination with safety nets for helidecks with (TLOF) sizes less than 1.0D. 	RP 161 Par. 6.6 (+ 5.3.2, 5.5.2, 5.6, and 6.2.7) Safety Net or Shelf? ☐ Net/☐ Shelf/☐ NA Material: Width:
6.1.2	The safety net or safety shelf need not extend around stairways oriented perpendicular to the helideck perimeter. Surrounds entire helideck where fall protection is necessary?	RP 161 Par. 6.6 (+ 5.3.2, 5.5.2, 5.6, and 6.2.7) ☐ Yes/☐ No
6.1.3	For chain link style netting an annual load test certificate shall be provided Annual load test certificate provided?	RP 163 Par. Appendix 3, Attmnt 1, 1.7 ☐ Yes/☐ No
6.2	**Design**	
6.2.1	Safety nets and shelves will have these common design features: 1) Net/shelf shall slope 10 degrees upward and outward from below the deck edge. 2) The outer edge shall not protrude above the helideck (TLOF). 3) Designed to support 300 lbs. (136kg) at any point, unless safety is ensured by other construction around the helideck. Inclinded degrees: Support 300 lbs: ☐ Yes/☐ No	RP 161 Par. 6.6 (+ 5.3.2, 5.5.2, 5.6, and 6.2.7) Inboard edge below deck edge? ☐ Yes/☐ No Outboard edge not higher than the deck surface? ☐ Yes/☐ No

Item	Specification	Reference and Comment or ✓if OK
6.2.2	Safety nets will have these design features in addition to those in 6.2.1: 1) Net material shall be flexible. 2) The net shall be securely attached, with the bar woven through netting and bolted. 3) The netting shall have a "hammock" effect, and not a "bounce" effect. 4) Longitudinal and lateral bars should avoid serious injury to persons falling on them. 5) The netting shall not be attached to the frame by a single continuous retaining wire. 6) A flame retardant, ultra violet (UV) resistant material (chain link, FricTape, Helimesh, etc). Note: Plastic coated chain link fencing material is not authorized as potential internal damage is not visible.	HM 3.5.6.2; RP 163 Par. 7.3.3 and Appendix 3, Attmnt 1, 1.7; BP Bar woven through net for attachment? ☐ Yes/☐ No Non-continuous retaining wire?
	Hammock effect? ☐ Yes/☐ No — Flame retardant material? ☐ Yes/☐ No	☐ Yes/☐ No
6.2.3	Safety shelves will have these design features in addition to those in 6.2.1. 1) Painted or constructed of materials in contrasting color to the helideck surface, normally yellow. 2) Constructed of corrugated materials and may be covered with safety netting, if desired.for purposes of personnel safety 3) Include an outer grab rail painted red.(unless a safety net is also installed on top of the shelves)	RP 163 Par. 7.3.3 Outer grab rail and painted red?
	Contrasting color? ☐ Yes/☐ No — Material type:	☐ Yes/☐ No
7	**OBSTRUCTIONS**	
	 	
7.1	**210 Degree Obstacle-Free Sector (OFS)**	
7.1.1	The surface of the obstacle-free sector (OFS) should be a horizontal plane level at the elevation of the helideck (TLOF) surface that subtends an arc of at least 210º from the reference point located on the perimeter of the 1.0*D* FATO at the intersection with the LOS. The OFS should extend outwards to a distance that will allow for an unobstructed	RP 161 Par. 5.3.5.2 OFS 210 degrees and correctly marked with the chevron?

Item	Specification	Reference and Comment or ✓if OK
	arrival and departure path to/from the helideck for the helicopter(s) it is intended to serve. Note: Legacy helidecks have alternative obstacle requirements, see RP 162 for the Assessment process and markings.	☐ Yes/☐ No Unobstructed approach and departure? ☐ Yes/☐ No
7.1.2	There should be no fixed obstacles within the obstacle-free sector (OFS) unless their function requires them to be located as follows: 1) On the TLOF perimeter such as drainage guttering, lighting, and firefighting equipment; 2) Just outside the TLOF perimeter i.e. foam monitors (where provided); 3) Tie-down points, handrails and other items associated with the TLOF which are incapable of complete retraction or lowering for helicopter operations. 4) When such objects are required to be located within the TLOF, the height above the TLOF surface should be limited to 2 in. (5 cm).	RP 161 Par. 5.3.5.2 Are OFS obstacles acceptable in location? ☐ Yes/☐ No Are allowed OFS obstacles acceptable in height? ☐ Yes/☐ No
7.1.3	For a helideck with a 1.0*D* FATO/TLOF or larger, objects which are required to be located outside the FATO/TLOF, such as foam monitors (where provided), lights, etc., the height shall be limited to 6 in. (15 cm).	RP 161 Par. 5.3.5.2 1.0D TLOF OFS obstacles acceptable in height? ☐ Yes/☐ No/☐ NA
7.1.4	For a helideck with a less than 1.0*D* TLOF, objects which are required to be located just outside the TLOF, such as foam monitors (where provided), lights, etc., the height above the TLOF surface shall be limited to 2 in. (5 cm).	RP 161 Par. 5.3.5.2 Less than 1.0D OFS obstacles acceptable in height? ☐ Yes/☐ No/☐ NA
7.1.5	For helidecks located in heavily congested areas with multiple offshore facilities, it may not be possible because of adjacent facilities to achieve the entire clear departure path throughout the full obstacle-free sector (OFS) with a minimum 210 degrees, in which case operational limitations may need to be applied by helicopter operator in consult with the facility owner. The helideck orientation in relation to adjacent facilities should be considered in the design process.	RP 161 Par. 5.3.5.2 Congested area OFS correctly marked? ☐ Yes/☐ No/☐ NA
7.1.6	Because they are thin and particularly difficult to see, whip antennas should not be placed within 1.5 ft. (5 m) of the edges of the LOS, even if technically they meet the obstacle clearance requirements.	RP 163 Par. 7.4.1.1 Note 2 Whip antennas located correctly? ☐ Yes/☐ No/☐ NA

Item	Specification	Reference and Comment or ✓if OK
7.2	**150 Degree Limited-Obstacle Sector (LOS)** The limited obstacle sector (LOS) is a complex sector originating at the reference point, located on the perimeter of the FATO and extending over the arc not covered by the obstacle free sector within which the height of obstacles above the level of the TLOF are limited. See drawing at 7.1 above for a depiction of these surfaces. **Note:** See the HSAC Helideck Design Table at the HSAC.org web site for required design widths and maximum allowed obstacle heights within the LOS complex sectors based on the helicopter type in use.	
7.2.1	The LOS should not subtend an arc greater than 150 degrees. Arc angle degrees?	RP 161 Par. 5.3.5.2
7.2.1	For a TLOF of 1.0*D* or larger, objects within the first segment of the LOS should not exceed a height of 10 in. (25 cm) above the TLOF surface. In the second segment the LOS sector surface rises at a rate of one unit vertically for each two units horizontally originating at a height 0.05*D* above the level of the TLOF. **Note :** The LOS distances are calculated using the "D" value of the largest aircraft endorsed to use the helideck	RP 161 Par. 5.3.5.2 Height objects first sector (max. 10 inches): Height of objects in second sector:
7.2.2	For a TLOF of 0.83*D*, objects within the first segment of the LOS, objects should not exceed a height of 2 in. (5 cm) above the TLOF surface. In the second segment the limited obstacle surface rises at a rate of one unit vertically for each two units horizontally originating at a height 0.05*D* above the level of the TLOF. **Note:** The height limit of 2 in. (5 cm) above the TLOF surface for objects whose function require them to be located on the TLOF perimeter, applies to the complete area between the TLOF and 1.0*D* FATO: it also applies to the OFS sector.	RP 161 Par. 5.3.5.2 Height objects in first sector (max.2 inches): Height objects in second sector:
7.3	**Obstacle Free Dropdown Sector (OFDS)** **Note:** The "shape" of the OFDS at water level is the same as the safety shelf/net shape.	





Item	Specification	Reference and Comment or ✓if OK
7.3.1	Below the TLOF level, within the same arc as the OFS, the obstacle-free dropdown sector (OFDS) should extend downward from the outer edge of the safety net or safety shelf at an elevation corresponding to that of the TLOF to the water level; within an arc of not less than 180º with the origin at the center of the TLOF	RP 161 Par. 5.3.5.3 Arc 180 degrees?
	Identify and note location of any objects that infringe:	☐ Yes/☐ No
7.3.2	The OFDS should have a falling gradient having a ratio of one unit horizontally to five units vertically (5:1) from the outer edge of the safety net or safety shelf within the 180 degree sector. For helidecks designed for the use of only multi-engine helicopters, the horizontal component of the falling gradient within the 180º sector may have a less demanding ratio of one unit horizontally to three units vertically (3:1).	RP 161 Par. 5.3.5.3 5:1 gradient for single engine helicopters? ☐ Yes/☐ No/☐ NA 3:1 gradient for multi engine helicopter? ☐ Yes/☐ No/☐ NA
7.3.3	It should extend outwards for a distance that will allow for safe clearance from obstacles below the helideck in the event of an engine failure for the type of helicopter the helideck is intended to serve. **Note 1:** The obstacle-free dropdown sector properties may need adjustment depending upon the performance of the selected helicopter and height of the helideck above the sea. The aircraft manufacturer should be able to provide the necessary technical data and in most cases this is included in the helicopter flight manual. **Note 2:** Raising the helideck elevation as high as practicable above the sea level will enhance the capability of the helicopter to safely execute an emergency water landing or fly away in the event of an engine failure.	RP 161 Par. 5.3.5.3 Distance acceptable for operations? ☐ Yes/☐ No Height above water acceptable for operations? ☐ Yes/☐ No
7.3.4	Minor infringements by foam monitor platforms or access/escape routes shall be accepted only if they are essential to the safe operation of the helideck.	RP 161 Par. 5.3.5.2 and 7.1 above Minor infringements acceptable? ☐ Yes/☐ No
8	**TURBULENCE AND EMISSIONS**	
8.1	**Structure and Orientation**	
8.1.1	Fixed installations shall be sited so that the prevailing wind over the helideck comes from open water across the helideck, not through the installation structure.	RP 163 Par. 7.3.7.3 Note 2 Helideck siting acceptable? ☐ Yes/☐ No
8.1.2	The helideck design should be subject to an airflow study if any obstructions other than helideck supporting structure is placed in the air gap or when gas discharges could affect helicopter operations and it may be necessary to establish, other turbulence mitigating design measures and/or operational limitations under certain wind conditions.	RP 161 Par. 4.9, 5.7 Is a wind study necessary? ☐ Yes/☐ No/☐ NA Air Flow Study available? ☐ Yes/☐ No/☐ NA

Item	Specification	Reference and Comment or ✓if OK
		Operational Mitigations required and in place?
		☐ Yes/☐ No/☐ NA
8.2	**Air Gap Beneath Helideck**	
8.2.1	An unobstructed minimum air gap of 10 ft. (3 m) shall be provided between the TLOF and any building roof, so the turbulent air can flow under the TLOF: this will minimize adverse effect to helicopter operations. **Note 1:** This unobstructed air gap can include necessary helideck support structure, piping, and other necessary helideck support equipment such as foam tanks, but in no case should the allowed obstructions exceed 70 % of the available air space. **Note 2:** A solid safety shelf instead of a safety net can reduce the turbulence problems from adjacent structures located near helidecks will serve to disperse the burble effect of the wind and in addition to provide an increased ground effect area.	RP 161 Par. 5.6 Air Gap Provided? ☐ Yes/☐ No Air gap height acceptable? ☐ Yes/☐ No Objects below deck minimized to reduce adverse effects? ☐ Yes/☐ No
8.3	**Hot Air, Raw Gas, and Hydrogen Sulfide (H2S) Discharge**	
8.3.1	Raw gas discharges or hot air discharges from compressors and cooling systems adjacent to helidecks may be hazardous to helicopter operations and can drastically affect helicopter performance and appropriate restrictions should be imposed on the use of the helideck where either of these types of discharges exist. As a general rule, a limit for the vertical airflow velocity of 5.75 ft/s (1.75 m/s) should not be exceeded. Hydrogen sulfide (H_2S) gas discharge in higher concentrations (300 ppm to 500 ppm) can cause loss of consciousness within a few seconds. **Note:** Gas detectors/Sniffers (generic term used to describe automated vapor detection devices) or other detection devices (infrared, etc.) may be used to detect these discharges and to automatically activate status lights when discharges present a hazard to flight operations.	RP 161 Par. 5.7 Any discharges on the facility that could pose a hazard? ☐ Yes/☐ No/☐ NA Velocity of discharges less than 5.75 ft/sec? ☐ Yes/☐ No/☐ NA Possibility of H2S discharges? ☐ Yes/☐ No
8.3.2	When designing helidecks that have been identified to have any of the above conditions that may be hazardous to helicopter operations a visual warning system (e.g. Helideck Status lights) should be provided to alert pilots of the hazard.	RP 161 Par. 5.7 Helideck Status Light(s) provided? ☐ Yes/☐ No

Item	Specification	Reference and Comment or ✓if OK
9	**ACCESS POINTS and WAITING AREA**	
9.1	**Number Required and Location**	
9.1.1	Two separate personnel access and egress routes, one primary and one secondary, shall be provided as a minimum. One route should be located remotely from the other; limited to emergency use and so marked to prohibit normal passenger flow. **Note 1:** When possible, the personnel access and egress routes should be outside the TLOF. **Note 2:** It may not be possible to provide two access/egress routes for helidecks mounted on top of minimum structures and therefore the number of access/egress routes may have to be limited to one, in which case this should be documented in the helideck's limitation listing facility operational procedures	RP 161 Par. 5.4 Number of Access Points: One located away from the primary and properly marked? ☐ Yes/☐ No/☐ NA
9.1.2	There should be a protected passenger waiting area at a minimum of 7 ft. (2.0m) below the elevation of the helideck surface, located away from any refueling equipment and fire firefighting access platforms.	RP 161 Par. 5.4 Passenger waiting area location: Suitable distance below the helideck? ☐ Yes/☐ No
9.1.2	Access points shall have a non-locking or frangible physical barrier across each entry/access to block access to the helideck when the helideck is not in active use.	RP 161 Par. 5.4 Barriers to access for access points not in use? ☐ Yes/☐ No/☐ NA
9.1.3	A safety net or safety shelf shall be provided to protect personnel from falling overboard during handrail foldup/fold down operations.	RP 161 Par. 5.4 Access openings properly protected? ☐ Yes/☐ No
9.2	**Handrails**	
9.2.1	Handrails should not protrude above the height of the TLOF surface; if they cannot be completely retracted or lowered for helicopter operations the height above the TLOF surface should be limited to max. 2 in. (5 cm). See 4.10.1 for markings.	RP 161 Par. 5.4 Handrails provided? ☐ Yes/☐ No Height above deck:

Item	Specification	Reference and Comment or ✓if OK
9.2.2	The handrails should be retractable, collapsible, or removable and not impede access and egress. **Note:** Handrails that fold over should fold onto the safety net, not over the access opening impeding the egress route.	RP 161 Par. 5.4 Handrails do not impede use of access? ☐ Yes/☐ No
9.3	**Emergency Use Exits**	
9.3.1	Emergency exit/egress handrails shall not exceed the height limits specified in 9.2.1 above the helideck level.	RP 163 Par. 9.12.2.a Height above deck:
9.3.2	Vertical emergency exits normally open to the helideck shall be covered with a lightweight grating to prevent inadvertent fall injuries.	RP 163 Par. 9.12.2.b Grating provided? ☐ Yes/☐ No/☐ NA
9.3.4	Exposed vertical emergency exit "ladders" shall be fully enclosed by a "cage" that will prevent personnel from falling through.	RP 163 Par. 9.12.2.d Cage provided? ☐ Yes/☐ No/☐ NA
10	**LIGHTING**	
10.1	**General**	
10.1.1	Lights shall be installed on manned facilities or other facilities where the possibility of use at night/low ambient light or during instrument flight conditions.	RP 161 Par. 8 Night or IFR planned/used? ☐ Yes/☐ No
10.1.2	If night vision goggle (NVG) approaches are anticipated the lights shall be NVG compatible.	NVG planned? ☐ Yes/☐ No/☐ NA
10.1.3	All lighting components and fitment should meet safety regulations relevant to a helideck environment as prescribed in API 500 or API 505 for lighting requirements, and as a minimum be rated for Class 1, Division 2.	Meet specifications? ☐ Yes/☐ No
10.1.4	A UPS system will be provided for all essential lighting (perimeter, flood, status, obstacle)	UPS provided? ☐ Yes/☐ No
10.2.5	Helideck lighting shall be switched from the Radio Officer's room and also from the Central Control Room if not co-located.	BP Dual switches? ☐ Yes/☐ No
10.2.6	Manual switching shall always be provided regardless of any remote radio-operated switching provided to pilots.	BP Manual switching? ☐ Yes/☐ No

Item	Specification	Reference and Comment or ✓if OK
10.2	**Perimeter Lighting**	
10.2.1	Perimeter lights should be outboard and adjacent to the TLOF edge. For designs where the perimeter lights cannot be outboard and adjacent then they may be mounted on the TLOF perimeter line marking but shall be flush mounted.	RP 161 Par. 8.2 Location outboard TLOF? ☐ Yes/☐ No
10.2.3	The TLOF shall be delineated by all green lights and shall be visible omni-directionally above the landing area level and visible at night. Note: The lights shall not be visible from below the helideck.	RP 161. 8.2 Light color: Visible only above the deck? ☐ Yes/☐ No
10.2.4	For square or rectangular shaped TLOFs there should be a minimum number of four lights on each side including one light at each the corner. For circular, hexagonal or octagonal shaped TLOFs, there should be a minimum of eight lights. For hexagonal or octagonal shaped TLOFs, there should be at least one light at or near as practicable to each corner and lights between the corners must be equally spaced.	RP 161 Par. 8.2 Number of lights: Minimum # of lights acceptable? ☐ Yes/☐ No
10.2.5	The perimeter lights shall be uniformly spaced at intervals of not more than 10 ft. (3.0 m).	RP 161 Par. 8.2 Spacing distance: Uniform spacing? ☐ Yes/☐ No
10.2.6	These lights should not protrude more than 6 in. (15 cm) above the elevation of the TLOF surface for a 1.0D TLOF or 2 in. (5 cm) for a less than 1.0D TLOF or any TLOF smaller than 40 ft.	RP 161 Par. 8.2 Height above deck:
10.2.7	The omni-directional perimeter lights should have an intensity and intensity distribution (beam spread) corresponding to the values defined in FAA Engineering Brief No. 87 **Note:** FAA Engineering Brief No. 87 applies to heliports but the intensity and intensity distribution (beam spread) requirements are equally applicable to helidecks.	RP 161 Par. 8.2 Lights meet specification? ☐ Yes/☐ No
10.3	**Floodlighting**	
10.3.1	Flood lighting is required to improve the ability of the pilot to see the TLOF markings (TDPM, 'H', size/weight (mass) limits) during approach and landing and to illuminate the	RP 161 Par. 8.3 Floodlighting provided? ☐ Yes/☐ No

Item	Specification	Reference and Comment or ✓if OK
	TLOF and surrounding area for helideck "ground" operations (passenger movements, refueling operations, cargo handling etc.)	Adequately situated? ☐ Yes/☐ No
10.3.2	For helideck ground operations, it may be possible to install additional high-mounted flood lighting away from the TLOF perimeter, such as on nearby structure outside the LOS. This additional flood lighting should not cause a source of glare to a pilot, especially when lifting in the hover to transition into forward flight, and should not present a competing light source to the green TLOF perimeter lights.	RP 161 Par. 8.3 Additional lighting required? ☐ Yes/☐ No Adequately situated? ☐ Yes/☐ No
10.3.3	The floodlights shall be located outside the TLOF perimeter line.	BP Outside TLOF? ☐ Yes/☐ No
10.3.4	Between 4 and 6 flood lights should be sufficient for most helidecks	RP 161 Par. 8.3 Number of floodlights: Number adequate? ☐ Yes/☐ No
10.3.5	To mitigate glare, flood lights should be mounted so that the centerline of the floodlight beam is at an angle of 45 degrees to the reciprocal of the prevailing wind direction. The height of the installed TLOF floodlights shall not exceed the heights prescribed in 7.1.3 or 7.1.4. **Note:** Adequate shielding should be used on any flood lighting that could dazzle or disorientate the pilot during an approach for landing and the arrangement/aiming of flood lights should be such that shadows are kept to a minimum	RP 161 Par. 8.3 Glare acceptable? ☐ Yes/☐ No
10.3.6	Flood lighting should provide an average horizontal illuminance of at least 10 lux, with a uniformity ratio (average to minimum) of not more than 8:1, measured on the surface of the TDPM. The spectral distribution of TLOF area floodlights should ensure adequate illumination of the surface markings (especially the touchdown/ positioning marking), the helideck name, and any obstacle markings.	RP 161 Par. 8.3 Floodlights meet specification? ☐ Yes/☐ No Adequate illumination of area? ☐ Yes/☐ No
10.4	**Obstacle Lighting**	
10.4.1	Where the highest point on the platform exceeds the elevation of the TLOF by more than 50 ft. (15 m), an omni-directional red light should be fitted at that position, with additional lights fitted at 35 ft. (10 m) intervals extending to the elevation of the TLOF. **Note:** At a helideck used at night with obstacles on which it is not possible or practicable to display obstacle lights, the obstacles should be flood lighted.	HM 5.15.3; RP 161 Par. 8.6; RP 163 Par. 7.5.1.3 Obstacles properly lighted? ☐ Yes/☐ No/☐ NA

Item	Specification	Reference and Comment or ✓if OK
10.4..2	Elevated obstructions that are not clearly visible should be marked with omni-directional red lights of at least 10 cd. Note: Specifications for obstruction lights are given in FAA Specification for Obstruction Lighting Equipment, FAA Advisory Circular 150/5345-43G.	HM 5.15.4, RP 161 Par. 8.6 Lights meet specifications? ☐ Yes/☐ No
10.5	**Surface Lighting**	
10.5.1	New technology lighting such as strip light emitting diodes (LED) for the TLOF perimeter or TDPM should be considered as these become more available, reliability is proven, and they meet the equivalent lighting specifications for existing lighting systems. Where provided these lights should meet the specification of CAP 437.	RP 161 Par. 8.1 If Surface lighting is provided does it meet specifications? ☐ Yes/☐ No
10.5.2	The system for securing the LEDs to the TLOF surface should be carefully reviewed to ensure the method of attachment will not cause damage to the helicopter landing gear or not present a roll over hazard for helicopters in the event the landing gear snags the LED	RP 161 Par. 8.1 Securing system no damages to landing gear or roll hazard? ☐ Yes/☐ No
10.6	**Helideck Status Lights**	
10.6.1	A red flashing helideck status light shall be provided at a manned facility. The intent of the helideck status light(s) is to indicate an unsafe landing area. When the status light is off, the helideck is checked and considered ready for flight operations and the illumination of a status light indicates the helideck is closed to helicopter operations.	RP 161. 7.5 Status light provided? ☐ Yes/☐ No/☐ NA Status light used properly? ☐ Yes/☐ No
10.6.2	The helideck status light(s) should be located near the primary personnel access and egress stairway to the helideck and be visible to the pilot of an approaching aircraft. When this location does not ensure approaching pilot visibility, add a second light at outboard corner of the TLOF. The light(s) should not exceed 2 in. (5 cm) above the level of the TLOF surface unless located in the LOS and not exceeding the obstacle height limitations in that sector. The helideck status light should be visible from all approach directions, i.e. 360° in azimuth. Note: Where one light/automated activation system can be technically designed to perform all the functions required, one single helideck status light can be used.	RP 161 Par. 8.5 # of Status lights: Status light location(s): Status light height: One light acceptable? ☐ Yes/☐ No
10.6.3	The light shall be left on and flashing in the manual mode at all other times until the helideck is considered ready for helicopter operations. Examples of these hazardous situations include but are not limited to the following: facility not prepared to accept helicopter operations, crane operations, wind conditions exceed helicopter limitations, etc.).	RP 161 Par. 8.5 Light on at all times when deck is not open for operations? ☐ Yes/☐ No

Item	Specification	Reference and Comment or ✓if OK
	Additionally, the helideck status light shall be operating during conditions hazardous to helicopter operations as listed in section 4.8. (hot air, raw gas, H_2S, etc.) and shall be automatically triggered and remain on until the hazard is cleared.	Auto activation during hazardous conditions? ☐ Yes/☐ No
10.6.4	The effective intensity of the helideck status light should be a minimum of 700 cd between 2° and 10° above the horizontal and at least 176 cd at all other angles of elevation. Back-up lights should be provided in the event of failure of the primary helideck status light(s). The helideck status light(s) should have a minimum flash rate of 60 flashes per minute, and where multiple lights are installed the lights should be synchronized to increase visual cueing for flight crews.	RP 161 Par. 8.5 Status light meets specification? ☐ Yes/☐ No Minimum flash rate of 60/min? ☐ Yes/☐ No Back up lights available? ☐ Yes/☐ No
10.6.5	The system shall be designed so that no single failure will prevent the system operating effectively if more than one light is used	RP 161 Par. 8.5 System designed to ensure operation if one light in not operational? ☐ Yes/☐ No/☐ NA
10.6.6	The height of the installed helideck status lights shall not exceed the heights prescribed in 7.1.3 or 7.1.4 above.	RP 161 Par. 5.3.5.2 Height of lights:
10.7	**Parking Area Lighting**	
10.7.1	Blue lights be provided around a parking area. If fitted, they shall be on a separate circuit and individually switched to the TLOF perimeter lights.	RP 161 Par. 8.4
10.7.2	Flush fitting lights or electro-luminescent panels in the 150 degree LOS perimeter shall be provided between the edge of the Touchdown and Lift Off Area (TLOF) and the parking area.	RP 161 Par. 8.2, 8.4 Flush lights provided, if required between the TLOF and PA? ☐ Yes/☐ No
10.7.3	Floodlights may be provided around the parking area, and they shall be on a separate circuit and individually switched to the helideck floodlights. They may be either deck-level xenon or elevated halogen lights, but shall not infringe on the height limits in 7.1.3 or 7.1.4 above.	RP 161 Par. 8.3 Flood lights provided? ☐ Yes/☐ No Height acceptable? ☐ Yes/☐ No

Item	Specification	Reference and Comment or ✓if OK
10.8	**Uninterruptable Power Supply (UPS)**	
10.8.1	Arrangements should be made so that there is no loss of critical (specified) lighting due to loss of the primary power system on the facility. Note: A critical lighting analysis should require at least 50 % of perimeter lighting and 100% of the access and egress routes, obstruction, status and windsock lights will remain operational.	RP 161 Par. 8.7 UPS provided? ☐ Yes/☐ No Designed to ensure 50% or perimeter and 100% of other? ☐ Yes/☐ No
10.8.2	This lighting may be supplied from the emergency power bus power so that power to the lighting is maintained, and be provided from an UPS sufficient to power the specified lighting for the period required for the emergency generator/bus to assume the load after the loss of primary power	RP 161 Par. 8.7 UPS back-up supported by Emergency Bus? ☐ Yes/☐ No
10.8.3	In the event that the facility is not equipped with an emergency generator/bus as noted above, the specified lighting should be connected to a UPS capable of powering the lighting for a period of at least 18 hours.	RP 161 Par. 8.7 UPS if not Emergency Bus supported, designed to support 18 hours? ☐ Yes/☐ No
11	**REFUELING SYSTEM**	
11.1	**Refer to APPENDIX 4, Attachment 7.**	
12	**FIREFIGHTING EQUIPMENT**	
12.1	**General**	
12.1.1	A risk assessment shall be completed to determine the level of fire protection necessary to contain a post-crash fire (PCF) in the event of a helicopter crash which in a worst case scenario the largest helicopter using the helideck has rolled onto its side with a full passenger load. The fire protection system should provide adequate time to evacuate all occupants from the helicopter and helideck. Note: Helideck surfaces with integrated firefighting nozzles can present a hazard to skid equipped helicopters, and this should be considered in the risk analysis/design of the fire protection system.	RP 161 Par. 5.5.1 Has RA been completed, appropriate parameters applied, and mitigations applied? ☐ Yes/☐ No
12.1.2	The requirements and fire protection system performance shall, as a minimum, be in accordance with NFPA 418, in particular Chapters 5 and 8, and when fueling systems are provided NFPA 407. Additional Information is available in API 2A-WSD.	RP 161 Par. 5.5.1 Minimal standard complied with? ☐ Yes/☐ No
12.1.3	Portable fire extinguishing equipment shall be readily accessible to the TLOF and parking area (if installed) and ramps may be necessary to allow the equipment to be easily moved from the firefighting access platforms or other storage areas to the TLOF/PA surface.	RP 161 Par. 5.5.1 Portable equipment readily available to the TLOF? ☐ Yes/☐ No

Item	Specification	Reference and Comment or ✓if OK
12.1.4	See 7.1.3 and 7.1.4 above for limitations on height restrictions for any firefighting equipment located on the TLOF perimeter.	RP 161 Par. 5.3.5.2 Height of fire system components above deck level: ☐
12.1.5	100% on-hand stocks of secondary (complementary) firefighting media to allow for replenishment as a result of activation of the system during an incident, or following training or testing, should be provided	RP 161 Par. 5.5.5 Adequate reserve stocks of secondary media? ☐ Yes/☐ No
12.1.6	All firefighting media/agents, including in stocks, should be compatible with each other.	RP 161 Par. 5.5.5 Agents compatible? ☐ Yes/☐ No
12.1.7	All firefighting hoses shall be on reels, when possible.	RP 163 Par. 13.9.2 Note 3 Hose reels provided? ☐ Yes/☐ No
12.1.8	All firefighting hoses shall be long enough to reach the furthest point on the helideck away from the firefighting position.	RP 163 Par. 13.9.2 Note 4; RP 161 Par. 5.5.8 Hoses of adequate length? ☐ Yes/☐ No
12.2	**Firefighting Personnel Access**	
12.2.1	The two personnel access and egress routes (see section 9 for further detail) should be designed as access points for fire-fighting/rescue personnel. As part of each access route, a firefighting access platform shall be provided 5 ft. (1.5 m) below the TLOF surface, outside the TLOF perimeter and with direct access to the helideck. This platform is used to house firefighting equipment such as hydrants, monitors and/or rescue equipment, as well as providing a staging area for the HLO and/or firefighting/rescue crews.	RP 161 Par. 5.3.4, 5.4, 5.5.2 2 access points with firefighting access platform? ☐ Yes/☐ No
12.2.2	If a firefighting access platform is to be located within the 180º OFDS, the firefighting access platform should be designed to remain within the width of the safety net/shelf (5 ft./1.5 m) or as close as practically possible. Note: For a minimum structure in accordance with API 2A-WSD, it may not be possible to provide two access/egress routes: this should be risk assessed in the design process.	RP 161 Par. 5.5.2 Firefighting access platform within the safety shelf/net confines? ☐ Yes/☐ No
12.3	**Manned Facilities Requirements**	
12.3.1	Manned facilities shall be equipped with: 1) A primary agent of one of the following: a) Fixed (foam) Monitor System (FMS), which can be operated remotely and manually with at least two foam/water branch lines	HM 6-2; RP 161 Par. 5.5; BP System provided primary: ☐

Item	Specification	Reference and Comment or ✓if OK
	b) Deck Integrated Fire Fighting System (DIFFS). Requirements for DIFFS not detailed in this checklist. If system in use, see RP 161 Par. B.7 c) Ring-Main System (RMS) to deploy foam automatically from a series of nozzles from the helideck perimeter d) Safe Deck self-extinguishing helideck surface (new technology). 2) A secondary agent (dry chemical and CO_2).	Secondary agent types:
12.3.2	100% on-hand stocks of secondary (complementary) media to allow for replenishment as a result of activation of the system during an incident, or following training or testing, should be provided	RP 161 Par. 5.5.5 Adequate reserve stocks of secondary media? ☐ Yes/☐ No
12.3.3	The primary and secondary systems shall be provided at each regular access point.	HM 6-2.14 Primary and secondary agents at each access point? ☐ Yes/☐ No
12.3.4	Complementary agents should be subject to annual visual inspection by a competent person and pressure testing in accordance with manufacturers' recommendations.	HM 6-4.9 Annual inspection results available? ☐ Yes/☐ No
12.4	**Primary System – Foam**	
12.4.1	The foam system should have a delay of less than 15 seconds using foam that is suitable for use with salt water, measured from the time the system is activated until the start of production of foam at the required application rate. The foam system should be designed to bring a helideck fire under control within 30 seconds measured from the time the system is producing foam at the required application rate. Note: A Compressed Air Firefighting System (CAFS) uses compressed air to deploy ready foam and will not be using (salt) water.	RP 161 Par. 5.5.4 Design activates within 15 seconds? ☐ Yes/☐ No Design controls fire within 30 seconds? ☐ Yes/☐ No
12.4.2	The foam system should be capable of delivering foam solution to the entire helideck surface. Note: The amounts of water required to support the fire system do not have to be stored on or adjacent to the helideck if there is a suitable adjacent pressurized water main system capable of sustaining the required discharge rate.	RP 161 Par. 5.5.4 Designed to cover entire deck? ☐ Yes/☐ No
12.4.3	Settings of adjustable inductors, if installed, should correspond with the strength of concentrate in use. All parts of the foam production system, including the finished foam, should be tested by a competent person on commissioning and results should be available for review.	HM 6-3.2, 3.3 Settings on inductors match concentrate strength in use? ☐ Yes/☐ No

Item	Specification	Reference and Comment or ✓if OK
		Finished foam test results available and not more than 1 year old? ☐ Yes/☐ No
12.4.4	Foam monitors shall be capable of remote automatic operation and have manual override.	BP Automatic monitors have manual over-ride? ☐ Yes/☐ No
12.4.5	Monitors shall be capable of rotation in azimuth and elevation to allow coverage of all the TLOF, and parking area, when provided, in all wind conditions.	BP Monitors rotate in azimuth and elevation yo allow coverage of entire TLOF? ☐ Yes/☐ No
12.4.6	Monitor Location:	
	1) Monitors shall be positioned so as to avoid any "dead" space where foam cannot be applied close to the monitor. This will invariably require the monitor discharge nozzle to be slightly above helideck level or set back from the edge of the helideck.	1) BP Is dead space near monitor covered? ☐ Yes/☐ No
	2) The design specification for a fixed monitor system (FMS) should ensure remaining monitors (minimum of 2) are capable of delivering finished foam to the landing area at or above the minimum application rate (see 12.6) when a 3d monitor may have limited effect due to winds.	2) RP 161 Par. Annex B, 14.1 Minimum of 2 monitors cover TLOF in adverse wind conditions? ☐ Yes/☐ No
	3) For areas of the helideck or its appendages which, for any reason, may be otherwise inaccessible to an FMS, it is necessary to provide additional hand-controlled foam branches.	3) RP 161 Par. Annex B, 14.1 Hand controlled devices available if needed? ☐ Yes/☐ No
12.4.7	Monitors shall be lockable in any selected position.	BP Monitors lockable? ☐ Yes/☐ No
12.4.8	Monitors shall not impede exit points.	HM 6-3.5.7.2 Monitors do not impede exit points? ☐ Yes/☐ No
12.4.9	Foam concentrates compatible with seawater and meeting at least Performance Level B are used. Note: For CAFS see 12.5.1.	RP 161 Par. Annex B, 14.3 Foam is compatible with sea water and perf level B? ☐ Yes/☐ No

Item	Specification	Reference and Comment or ✓if OK
12.5	**Primary Foam Rates**	
12.5.1	Level B foams should be applied at a minimum application rate of 1.33 gallons per square yard (6 L/m^2) per minute. **Note:** The formula for calculating the application rate is as follows: Application rate US customary units = 1.33 x π x r^2 Application rate metric units = 6 x π x r^2 An example calculation for a D-value 22.2 m (24.27 yards) helideck is as follows: Application rate = 1.33 x π x (12.13)^2 = 615 USG/min -or- ((6 x π x (11.1)^2) = 2,322 l/min	RP 161 Par. Annex B, 14.3 CAP437, 5.13 Required foam minimum application rate:
12.5.2	There should be the ability to deploy at least two deliveries with hand-controlled foam branch pipes for the application of aspirated foam at a minimum rate of 60 gallons/min (225 liters/min) through each hose line. A single hose line, capable of delivering aspirated foam at a minimum application rate of 60 gallons/min (225 liters/min), may be acceptable where it is demonstrated that the hose line is of sufficient length, and the hydrant system of sufficient operating pressure, to ensure the effective application of foam to any part of the landing area irrespective of wind strength or direction. The hose line(s) provided should be capable of being fitted with a branch pipe capable of applying water in the form of a jet or spray pattern for cooling, or for specific firefighting tactics	RP 161 Par. Annex B, 14.6 Two hand-controlled foam pipes available? ☐ Yes/☐ No Application Rate: Hose lines capable of fitting with a branch pipe? ☐ Yes/☐ No
12.6	**Primary Foam Stocks**	
12.6.1	Operational stocks shall allow for a minimum of 5 minutes usage at the required application rate multiplied by the percentage of concentrate for one of the following: Using the 22.2 meter example as shown in B.4, a 1 % foam solution discharged over five minutes at the minimum application rate will require 502 gallons x 1% x 5 = 25.1 gallons of foam concentrate (2,322 × 1 % × 5 = 116 liters of foam concentrate). A 3 % foam solution discharged over five minutes at the minimum application rate will require 502 gallons x 3% x 5 = 75.3 gallons of foam concentrate (2,322 × 3% × 5 = 348 liters of foam concentrate).	RP 161 Par. Annex B, 14.3, 14.6 Amount of foam on hand for 5 minutes use: Required amount on hand? ☐ Yes/☐ No
12.6.2	The helideck firefighting foam tank shall hold at least the minimum operational stock. **Note:** Ensure sufficient stock available for annual training and testing and 100% of minimum necessary in system foam to be in stock for replenishment.	HM 6-2.7, 2.7.1 Tank capacity matches required stocks? ☐ Yes/☐ No
12.6.3	The foam tank shall be clearly marked with the type of foam, its concentration, and the tank capacity/serial number. Note: Mixing of different concentrates in the same tank, i.e. different either in make or strength is not acceptable.	BP Foam tank marked with capacity, type of foam, and concentration: ☐ Yes/☐ No

Item	Specification	Reference and Comment or ✓if OK
12.6.4	Reserve foam stock (100%) shall be equivalent type to the minimum operational requirement foam inside the system. Reserve foam stocks may be provided from the main installation foam system, if compatible, or by the provision of additional foam equipment in dedicated tanks that hold the required volume of concentrate, or in drums.	HM 6-2.7.1 Reserve stock amount: BP
12.7	**Secondary System Manned and Unmanned Facilities - Dry Powder**	
12.7.1	The minimum total capacity should be 100 lbs. (45 kg) delivered from extinguishers of not less than 20 lbs. (9 kg) each.	RP 161 Par. 5.5.5 Total quantity supplied: # of bottles:
12.7.2	All applicators are to be fitted with a mechanism which allows them to be hand controlled.	RP 161 Par. 5.5.5 Hand control provided? ☐ Yes/☐ No
12.7.3	The hose length on each portable bottle shall be long enough to reach the center of the Touchdown and Lift Off Area (TLOF). Alternatively, portable bottles may be used provided they are on wheeled trolleys which are housed in sloped ramps at the side of the exits, to enable them to be maneuvered onto the helideck by one person.	HM 6-2.9 Hose length sufficient to reach entire TLOF? ☐ Yes/☐ No
12.7.4	One bottle shall be located at every normal and emergency exit.	RP 161 Par. 5.5.5, 5.5.8 One bottle at every exit? ☐ Yes/☐ No
12.7.5.	Dry chemical powder should be of the 'foam compatible' type.	HM 6-4.6 Foam Compatible? ☐ Yes/☐ No
12.8	**Secondary System Manned and Unmanned Facilities – Gaseous**	
12.8.1	The appropriate minimum quantity delivered from one or two CO_2 extinguishers is 40 lbs. (18 kg).	RP 161 Par. 5.5.5 Minimum of 40 lbs? ☐ Yes/☐ No
12.7.2	All applicators are to be fitted with a mechanism which allows them to be hand controlled.	RP 161 Par. 5.5.5 Hand controlled provided? ☐ Yes/☐ No

Item	Specification	Reference and Comment or ✓if OK
12.8.2	One CO_2 bottle shall be located at every normal and emergency exit.	HM 6-2.14, 5.5.5 One bottle at each exit? ☐ Yes/☐ No
12.8.3	One CO2 bottle shall be equipped with a long lance compatible to the aircraft type(s) operated on the helideck to address potential engine fires during helicopter start-up.	RP 163 13.4 Note 2, 9.1.3, Table 26, Table 27 One long lance equipped? ☐ Yes/☐ No
12.9	**Requirements for Normally Unattended Installations (NUIs)**	
12.9.1	Consideration should be given to the selection and provision of foam as the principal agent. For an NUI, where helideck rescue and firefighting (RFF) equipment will be unattended during certain helicopter movements, the pressurized discharge of foam through a manually operated fixed monitor system is not recommended. For installations which are at times unattended the effective delivery of foam to the whole of the TLOF area may best be achieved by means of a deck integrated firefighting system (DIFFS). See RP 161 Par. 4.6.6	RP 161 Par. 5.5.6 NUI primary agent:
12.9.2	As a minimum, NUIs shall have two (2) 40 lb. (18 kg) dry powder fire extinguishers available in close proximity of the helideck (i.e. stairwell landing). See Annex B for additional details.	RP 161 Par. 5.5.6 Minimum of two (2) 40 lb. (18 kg) dry powder fire extinguishers available? ☐ Yes/☐ No
12.10	**Parking Area (PA) and Parking Transition Area (PTA) Firefighting**	
12.10.1	If the PA has one or more shared access locations with the TLOF area, with their own firefighting provisions, these can be used for both the TLOF and PA/PTA provided that these systems have capability to cover both areas. If separate systems are installed for the TLOF and PA/PTA that the activation/ deployment of firefighting systems they should be activated independently. Although it is unlikely that the firefighting systems for both the TLOF and PA will have to be activated at the same time, it should be considered that a helicopter incident could occur while transitioning from the TLOF to the PTA and the system(s) shall be designed accordingly.	RP 161 Par. 5.5.8 How is PA protection provided? If separate systems, can they be activated separately? ☐ Yes/☐ No
12.10.2	The PA shall have two sets of fire extinguishers with Complementary Dry Chemical and Gaseous Agents (per RP 161 Par. 4.6.5) which shall be readily accessible from the PA.	RP 161 Par. 5.5.8 Minimum of 2 sets of portable agents? ☐ Yes/☐ No
12.10.3	The PA shall, at a minimum, have two water hydrants with a preference for a combined foam/water hydrant. A hydrant shall be placed on each side of the PA and must have a hose with sufficient length to cover the entire PA/PTA.	RP 161 Par. 5.5.8 Two water hydrants provided? ☐ Yes/☐ No

Item	Specification	Reference and Comment or ✓if OK
		Hose length adequate to cover all of the PA? ☐ Yes/☐ No
12.10.4	If the PA is designed to enable a helicopter to fly or hover into it, it is recommended that in addition to the water/foam hydrants, that additional fixed firefighting systems be considered. These can be additional foam monitors or (water only) DIFFS. Alternatively, a passive firefighting (recessed drainage) system can be installed to self-extinguish a post-crash fire.	RP 161 Par. 5.5.8, Annex B If a hover in PA, additional equipment provided? ☐ Yes/☐ No
13	**RESCUE EQUIPMENT**	
13.1	**Requirements**	
13.1.1	Waterproof & Accessible Crash Box – For manned facilities a minimum of one vertical cabinet with shelves (one by each helideck access point preferred). The cabinet shall be located on landings close to the helideck, or at the primary entry to the access stairwell.	RP 163 Par. 11.2.1, Appendix 3, Attmnt 1, 6.1 Crash box provided and in proper location? ☐ Yes/☐ No
13.1.2	The doors of the cabinet shall be secured with low-strength lock wire/frangible seal that could be easily broken, but which would indicate that a cabinet had been opened.	RP 163, 11.2.1 Crash box secured with frangible seal? ☐ Yes/☐ No
13.1.3	Each cabinet shall have a list of contents affixed to the inside.	RP 163, 11.2.1 Inventory in crash box? ☐ Yes/☐ No
13.1.4	Each cabinet shall be lit by external lighting if night operations will be used.	RP 163, 11.2.1 Crash box lighted internally? ☐ Yes/☐ No
13.2	**Equipment**	
13.2.1	Crash rescue box tools (one per crash box, unless noted differently):	RP 163 Par. Appendix 3, Attmnt 1, 6.2

Crash Rescue Box Contents

#	Description	Quantity
1	Adjustable Wrench	1
2	Large Rescue Axe	1
3	Bolt Cutters	1
4	Crow Bar	1
5	Heavy Duty Hacksaw	1
6	Hacksaw Blades	6

All listed contents provided and serviceable?
☐ Yes/☐ No

Item	Specification			Reference and Comment or ✓if OK
	7	Fire Resistant Blanket	1	
	8	Side-cutting pliers	1	
	9	Set of Assorted Screwdrivers	1	
	10	Harness Cutting Knife with Sheath	1 per helideck team member	
	11	Fire Resistant Gloves	Min. 2 pairs per heli-deck crew member	
	12	Life-line (minimum size of 5 cm x 15 meters) with metal snap ring at one end with rescue harness	1	
	13	Man-Made Mineral Fibre (MMMF) Filter masks	1 per helideck team member	
13.2.2	Aluminum Ladder (two separate detachable sections: each section a minimum of 2-3 meters long) in close proximity of helideck stored horizontally.			RP 163 Par. Appendix 3, Attmnt 1, 6.3 Ladder available in proper location and serviceable? ☐ Yes/☐ No # of sections?
13.3.3	Hook, Grab, or Salving (one) in close proximity of helideck stored horizontally. 4.5 meter two piece oak handle with brass connector.			RP 163 Par. Appendix 3, Attmnt 1, 6.4 Serviceable grab hook in proper location? ☐ Yes/☐ No
13.3.4	Self-Contained Breathing Equipment (SCBE) stored in a weatherproof green cabinet near the fire station/helideck and marked "Breathing Apparatus". 2 sets with spare cylinders # of sets?			RP 163 Par. Appendix 5, 2.2 SCBE available in proper location and serviceable? ☐ Yes/☐ No
14	**PROTECTIVE CLOTHING (PPE)**			
14.1	**Requirements:** All personnel assigned to rescue and firefighting duties shall be provided with PPE.			
14.1.1	The following equipment is recommended and it should meet one of the below specifications: **Note:** Due to static electricity and melding in flames, nylon clothing shall not be worn by helideck personnel. All equipment shall be fire retardant, and oil resistant.			RP 163 Par. 9.7, 9.9, 11.2 BP PPE meets specifications? ☐ Yes/☐ No

Item	Specification			Reference and Comment or ✓if OK
	Equipment	**BS/EN**	**NFPA 407**	
	Helmet with Full Face Visor	BS EN 443	NFPA 1971	
	Gloves, fire retardant	BS EN 659		
	Boots, safety toe compliant	BS EN ISO 20345		
	Tunic and Trousers	BS EN 469 or BS EN ISO 14116		
	Flash-Hood	BS EN 13911		
	Hearing Protection: with aviation VHF wired into the communications headsets, integral the helmets preferred			Hearing protection integral to helmets? ☐ Yes/☐ No Radios integral to helmets? ☐ Yes/☐ No
	The helideck crew members shall be readily identifiable to the helicopter crew and passengers as the person in charge of operations. The preferred method of identification is a bright (color contrasting to the firefighting coveralls) vest or jacket with the word "HLO", "HDA" or "FG" as appropriate stenciled on the front and back of the vest or jacket.			Helideck crew identifiable by text on clothing? ☐ Yes/☐ No
	Light Wands for Hand Signals at Night (see RP 163 Par. 9.9)			Light wands provided for night operations? ☐ Yes/☐ No
14.1.2	PPE shall be stored in a vertical weatherproof cabinet with shelves shall be provided for quick access to the helideck. See 13.1 above for vertical cabinet requirements.			RP 163 Par. 11.2 Weatherproof cabinet or location provided for PPE? ☐ Yes/☐ No
15	**ADDITIONAL EQUIPMENT**			
15.1	**Requirements**			
15.1.1	The additional equipment listed below is required to be in place prior to commencement of operations, and for the transit from the fabricator to the operation destination, if helicopter support may be required enroute.			BP Required equipment provided? ☐ Yes/☐ No
15.1.2	Additional equipment shall be provided by the fabricator to meet the requirements of the Operator.			BP
15.2	**Safety Notices/Posters**			
15.2.1	The Helicopter Operator shall provide drawings of the Safety Notices required for passenger lobby in dual language, if required.			RP 163 Par. 9.12.1 Posters provided and in dual language, if required? ☐ Yes/☐ No Languages:

Item	Specification	Reference and Comment or ✓if OK
15.2.2	The subjects covered shall be representative of the helicopters to be used and shall include, but not be limited to, the following: 1) Tail and main rotor clearances and danger zones 2) Approved approach directions 3) Emergency Exits	RP 163 Par. 9.12.1 Required subjects covered? ☐ Yes/☐ No
15.2.4	Personnel access points will have with a sign stating "No Access During Helicopter Operations" or equivalent	RP 163 Par. 9.12.1 Required signage provided? ☐ Yes/☐ No
15.3	**Chocks**	
15.3.1	Chocks (Rubber or Sand Bags: Minimum of 6; 2 per aircraft wheel) # Provided?	RP 163 Par. 9.10, Appendix 3, Attmnt 1. 5.9 Type chocks?
15.3.2	Helideck fitted with landing net shall have sandbags as chocks.	RP 163 Par. 9.10 Sandbag chocks for landing nets? ☐ Yes/☐ No
15.4	**Tie-Down Straps**	
15.4.1	Helicopter Tie-down straps (Minimum of 4; breaking strength of 12,000 lbs.) with manufacturer's load capability attached. Tie-down straps shall be compatible to tie-down points.	RP 163, 9.13.e, Appendix 3, Attmnt 1. 5.5 Compatible?
	# of tie-down straps: ☐ Breaking Strength? ☐	☐ Yes/☐ No
15.5	**Scales for Passengers/Baggage/Cargo**	
15.5.1	The scales shall read up to 500 pounds (230 kg).	RP 163. 11.5.b Scales provided? ☐ Yes/☐ No
15.5.2	The scales shall be located in the passenger check-in area.	RP 163. 9.12.3 Note Scales in proper location? ☐ Yes/☐ No
15.5.3	The last calibration and required annual recalibration dates of the scales shall be attached to the unit.	RP 163, Appendix 3, Attmnt 1, 5.1 Scales calibrated annually? ☐ Yes/☐ No

Item	Specification	Reference and Comment or ✓if OK
15.6	**Helicopter Start Unit (Manned Facilities Only)**	
15.6.1	The Helicopter Operator shall provide specifications for the type and power requirements of HSU, if required.	RP 163 Par. 9.13.h Helicopter start unit provided? ☐ Yes/☐ No/☐ NA
15.6.2	If an HSU is required, it shall provide a connection to an appropriate aircraft compatible electrical power outlet on the helideck edge.	BP Power available at deck edge? ☐ Yes/☐ No/☐ NA
15.7	**Snow and Ice Clearing (Manned Facilities Only)**	
15.7.1	Equipment for clearing the helicopter landing area of snow and ice and other contaminants shall be provided for cold weather environments.	RP 163 Appendix 3 Attmnt 1 5.11 Cold weather contamination equipment provided, if required? ☐ Yes/☐ No/☐ NA
15.8	**Pre-Flight Safety Video (Manned Facilities Only)**	
15.8.1	The Operator shall provide a suitable pre-flight safety video for use on the installation prior to the commencement of helicopter operations.	RP 163 Par. 9.12.5, Appendix 3 Attmnt 1, 5.6 Safety video provided? ☐ Yes/☐ No
15.8.2	The safety video shall be in the appropriate language(s).	Dual language if needed? ☐ Yes/☐ No/☐ NA
15.8.3	Suitable video media player, provided in the passenger briefing room	Video player provided? ☐ Yes/☐ No
15.9	**Prohibited Landing Marker**	
15.9.1	This marker used to temporarily close a helideck should be made from vinyl or other durable material in the shape of a diagonal "X". The marker shall be red background 13 feet (4m) square with the legs of the "X" 3 feet (0.5m) in width.	RP 163 Par. 8.8.1,RP 163 Appendix 3 Attmnt 1, 5.2 Prohibited landing marker provided? ☐ Yes/☐ No Storage location of Marker:

Item	Specification	Reference and Comment or ✓if OK
15.9.3	The duration, time, location, and nature of temporary closings shall be provided to and coordinated with nearby helicopter bases, and helicopter operators supporting the area. Documented procedures to notify helicopter operator(s) shall be in place.	RP 163 Par. 8.8.1 Procedures to notify helicopter operator(s)? ☐ Yes/☐ No
15.9.4	The marker shall have procedures in the HOM to require it to be tied down across the "H" for occasions when: a) helideck use is prohibited/helideck is closed for helicopter use, and b) radio contact is not available between aircraft and the installation.	RP 163 Par. 8.8.1 Procedures for use of the marker available? ☐ Yes/☐ No
15.10	**Windsock**	
15.10.1	At least one windsock shall be positioned in a location to be visible for takeoff and landing to indicate clear-air wind speed and direction.	RP 163 Par. 7.6.2 Windsock available and serviceable? ☐ Yes/☐ No
15.10.2	Windsocks shall not infringe the obstacle clearance sectors (OFS, LOS, OFDS).	RP 163 Par. 7.6.2 Windsock clear of clearance sectors? ☐ Yes/☐ No
15.10.3	At least one windsock shall be illuminated if night operations are planned. This windsock lighting should not be a glare hazard to pilots.	RP 163 Par. 7.6.2 Illuminated if required? ☐ Yes/☐ No/☐ NA
15.10.4	Where the primary windsock is subject to disruption in certain wind conditions, a second windsock should be installed to provide accurate wind information for the disrupted sector as a minimum.	RP 163 Par. 7.6.2 2nd windsock required? ☐ Yes/☐ No Provided? ☐ Yes/☐ No/ ☐ NA
15.10.5	A windsock shall be a truncated cone made of a lightweight (mass) fabric of orange color and should have the following minimum dimensions: length 4 ft. (1.2 m), diameter (larger end) 14 in. (0.3 m) and diameter (smaller end) 8 in. (0.15 m).	RP 163 Par. 7.6.2 Windsock proper color and size? ☐ Yes/☐ No
15.11	**Miscellaneous Equipment, Depending on operational requirements**	
15.11.1	Helicopter towing/ground handling equipment (optional) could be needed for moving an aircraft that may be down for maintenance, etc. to another location on the helideck or for towing into a parking area.	RP 163 Par. 9.13.k Ground handling equipment provided? ☐ Yes/☐ No/ ☐ NA

Item	Specification	Reference and Comment or ✓if OK
15.11.2	If a helicopter is staged offshore and helicopter maintenance activities are to be performed offshore on the helideck, compressed air and fresh water shall be available. **Note:** Availability of aircraft maintenance stands with safety features meeting local 'working at heights' requirements should be considered.	RP 163 Par. 9.13.d Compressed air and water, if a maintenance helideck? ☐ Yes/☐ No/ ☐ NA
16	**RADIO EQUIPMENT (Manned Facilities only)**	
16.1	**Fixed Radio Requirements**	
16.1.1	Two VHF Air radios with selectable frequencies shall be provided, one for the Radio Operator/Control Room, and one for the HLO office.	RP 163 Par. 7.7.1 Two aviation VHF fixed radios provided? ☐ Yes/☐ No
16.1.2	The VHF Air radios shall be dedicated to air traffic communications.	RP 163 Par. 7.7 Dedicated to air traffic? ☐ Yes/☐ No
16.1.3	The VHF radios shall be connected to a UPS.	RP 163 Par. 7.5.1.6 Connected to UPS? ☐ Yes/☐ No
16.1.4	The radio call sign of the installation shall match the installation identification marking on the helideck.	RP 163 Par. 7.7.1 Call sign matches facility marking? ☐ Yes/☐ No
16.1.5	The Radio Operator/HLO shall be able to transmit and receive and change frequencies on the radio while seated at his work station.	RP 163 Par. 7.7.1, BP Radio operator/ HLO can change frequencies? ☐ Yes/☐ No
16.1.6	A digital recorder with direct connection to the radio systems should be installed and should record a minimum of 4 hours on a continuous loop.	RP 163 Par. 7.7.1 Digital recorder provided? ☐ Yes/☐ No
16.2	**Portable Radio Requirements**	
16.2.1	At least two portable VHF Air radios with selectable frequencies shall be provided for use by the HLO. These should include provision for use with hard hat integrated speakers and/or headsets	RP 163 Appendix 3, Attmnt 1, 4.2, BP Two portable aviation VHF radios provided? ☐ Yes/☐ No

Item	Specification	Reference and Comment or ✓if OK
16.3	**Non Directional Beacon (NDB)**	
16.3.1	An NDB, meeting aviation standards, shall be fitted to the manned installation unless GPS approaches have been approved for use offshore by the CAA.	RP 163. Appendix 3, Attmnt 1, 4.3 NDB required? ☐ Yes/☐ No
16.3.2	The frequency and call sign of the NDB shall be established and approved by the helideck location's associated country regulator prior to start of helicopter operations. Temporary frequencies and call signs may be used in transit.	BP NDB frequency and identified provided? ☐ Yes/☐ No

NOTES:

Item	Specification	Reference and Comment or ✓if OK
7	**WEATHER EQUIPMENT (Manned Facilities Only)**	
17.1	**Requirements**	
17.1.1	In addition to a windsock noted in 15.10, shall be equipped with a weather station with the following elements for **VFR operations**:	RP 163 Par. 7.6.3
	1) temperature gauge with annual calibration, and	Date?
	Temperature gauge provided? ☐ Yes/☐ No — Annual calibration provided? ☐ Yes/☐ No	
	2) a barometric gauge with annual calibration, and	Date?
	Barometric gauge provided? ☐ Yes/☐ No — Annual calibration provided? ☐ Yes/☐ No	
	3) a means of providing cloud ceiling height and visibility (either with a trained weather observer (see Section 12) or Automated Weather Observation System (AWOS) with annual calibration, and	If sensors are provided, annual calibration provided? ☐ Yes/☐ No Date?
	Cloud ceiling height & visibility provided? ☐ Yes/☐ No — Provided by what means? ☐ Yes/☐ No	
	4) a means of relaying this weather information to the helicopter pilot, and	Means to transmit to pilot provided? ☐ Yes/☐ No
	5) ability to report sea state which may be estimated visually or by using wave measurement equipment, and	Sea state provided? ☐ Yes/☐ No
	6) offshore floating facilities must also have a means of measuring helideck pitch, roll and heave. See 17.3 below for additional details	RP 163 Par. 8.16
	Helideck movement measurement equipment provided for floating facilities?	☐ Yes/☐ No
17.1.2	**For areas where IFR or night operations** are to be conducted, the weather station must provide all the items in 17.1.1 above and in addition the following shall be provided:	RP 163 Par. 7.6.4 IFR or night operations planned? ☐ Yes/☐ No
	1) the weather observer shall be trained in an approved weather observation course resulting in certification, and	RP 163 Par. 12.6 Weather observer trained and certified? ☐ Yes/☐ No
	2) consideration should be given to providing AWOS with certified weather capabilities, and	AWOS provided? ☐ Yes/☐ No
	3) dew point shall also be provided.	Dew point is provided? ☐ Yes/☐ No

Item	Specification	Reference and Comment or ✓if OK
17.1.3	The instruments above shall have readings displayed in the control room/radio room and also HLO station.	Weather instrument display in control room & HLO station? ☐ Yes/☐ No
17.2	**Back Up Weather Instrumentation,** all required to be calibrated annually	
17.2.1	Handheld anemometer, providing wind direction in degrees magnetic	RP 163 Par. 7.6.1.2.a, RP 163 Appendix 3, Attmnt 1, 2.5 Back-up anemometer provided? ☐ Yes/☐ No
17.2.2	Air temperature gauge	RP 163 Par. 7.6.1.2.b Back-up temperature gauge provided? ☐ Yes/☐ No
17.2.3	Barometer	RP 163 Par. 7.6.1.2.c Back-up barometer provided? ☐ Yes/☐ No
17.3	**Pitch, Roll, and Heave (PRH) for Floating Facilities**	
17.3.1	PRH sensors shall be accelerometers located under the center of the helideck plate. If offset locations are used, the PRH software shall be capable of adjusting the actual readings to the helideck position.	RP 163 Par. 8.16.2 Accelerometers provide measurements calibrated to helideck level? ☐ Yes/☐ No
17.3.12	For floating facilities, pitch, roll, and heave requirements have been established and are followed?	RP 163 Par. 8.16 PRH procedures established and followed? ☐ Yes/☐ No
	PRH limitations are aligned between helideck owner and helicopter operator(s)?	☐ Yes/☐ No
17.3.3	The PRH system shall be capable of recording accurate movements over a 20-minute period and calculating the average heave rate and will meet all the requirements in RP 161 Par. 18.6.	RP 163 Par. 8.16 PRH system calculates requirements specified in RP 163 Par. 8.16? ☐ Yes/☐ No

Item	Specification	Reference and Comment or ✓if OK
18	**MISCELLANEOUS (Manned Facilities Only)**	
18.1	At least one crane shall have the reach and weight capability to enable heavy objects to be lifted to or from the helideck, and to move unserviceable aircraft to other installation areas, if necessary.	BP One crane can reach helideck? ☐ Yes/☐ No
18.2	When an installation may be required to receive or dispatch significant items of heavy cargo by helicopter, a "dumb waiter", or suitable storage area on or near the helideck, shall be provided to enable cargo to be either brought to or moved from the helideck while rotors are turning, or stored on the helideck without infringing obstacle clearance requirements while rotors are turning.	BP Cargo elevator provided? ☐ Yes/☐ No/☐ NA

NOTES:

<table>
<tr><th>Item</th><th>Specification</th><th>Reference and Comment or ✓if OK</th></tr>
<tr><td>19</td><td colspan="2">PERSONNEL</td><td></td></tr>
<tr><td>19.1</td><td colspan="2">Minimum of three personnel designated for helideck operations:
Helicopter Landing Officer, Helideck Attendant, and Fire Guard.
Note: Where the HLO has also been assigned additional Safety Critical Tasks (e.g. Medic), a back-up HLO shall be available at all times.</td><td>RP 163 Par. 9.1
Three helideck personnel provided?
☐ Yes/☐ No</td></tr>
<tr><td>19.2</td><td colspan="2">Personnel have initial or recurrent training certificates issued based on the frequency shown below.
<table><tr><th>Elements</th><th>HLO</th><th>HDA</th></tr><tr><td>DG/HAZMAT Awareness (3 years)</td><td>✓</td><td>✓</td></tr><tr><td>HLO/HDA Initial Training Helideck Operations</td><td>✓</td><td>✓</td></tr><tr><td>Helideck Emergency Response Team Member (HERTM)</td><td>✓</td><td>✓</td></tr><tr><td>Radio Operations</td><td>✓</td><td></td></tr><tr><td>Helideck Emergency Response Team Leader (HERTL)</td><td>✓</td><td></td></tr><tr><td>Fuel System Operations (If installed on the facility)</td><td>✓</td><td>✓</td></tr><tr><td>HERTM Refresher and HDA Competency Assessment (2 years)</td><td></td><td>✓</td></tr><tr><td>HERTL Refresher and HLO Competency Assessment (2 years)</td><td>✓</td><td></td></tr></table></td><td>RP 163 Par. 12.2
All helideck personnel have received appropriate training and are current?
☐ Yes/☐ No</td></tr>
<tr><td>19.3</td><td colspan="2">Back-up personnel available for all positions and trained?</td><td>RP 163 Par. 9.1
Back-up personnel provided and trained?
☐ Yes/☐ No</td></tr>
<tr><td>19.4</td><td colspan="2">Fire Guard (FG): A Fireguard must be trained in a multi-day fire-fighting course that includes use of self-contained breathing equipment (SCBE), or a fully trained second HDA can assume fireguard duties.</td><td>RP 163 Par. 12.4
FG trained in firefighting and SCBE?
☐ Yes/☐ No</td></tr>
<tr><td>19.5</td><td colspan="2">Fueling Personnel: HLOs and HDAs or other designated refueling personnel shall be trained in basic refueling requirements for helicopters, inclusive of quality control and associated firefighting aspects.</td><td>RP 163 Par. 12.5
Fueling personnel trained?
☐ Yes/☐ No</td></tr>
<tr><td>19.6</td><td colspan="2">Weather Observer: Weather observers must have appropriate training based on the description of their duties as noted below
<table><tr><th>Weather Course</th><th>Description</th><th>Who Should Attend</th></tr><tr><td>Basic Observation</td><td>Provides training in basic weather observation for VFR operations, but no certification.</td><td>HLOs, personnel stationed at the weather observer system displays</td></tr><tr><td>Certified Weather Observer</td><td>Provides certificated training in weather observation for IFR/night operations valid for 2 years</td><td>Personnel providing weather observations for IFR or night operations or where an automated weather observation system (AWOS) is in use.</td></tr></table></td><td>RP 163 Par. 12.6
Weather observers trained and current?
☐ Yes/☐ No</td></tr>
</table>

Item	Specification			Reference and Comment or ✓if OK
	Refresher Training for Weather Observers	Provides basic refresher training in weather observation for certified observers	All certified weather observers every 2 years	
19.7	**Dangerous Goods**: The following personnel should receive dangerous goods awareness training when associated with helideck operations or involved with: - Manifesting, - Storage and loading of cargo, storage and loading of baggage, and - Passenger handling - Security staff responsible for screening passengers and their baggage should also receive dangerous goods awareness training.			RP 163 Par. 12.8 All personnel have DG awareness training? ☐ Yes/☐ No
20	**EMERGENCY RESPONSE**			
20.1	Emergency Response Plan (ERP) published based on a Risk Assessment			RP 163 Par. 13 ERP based on RA? ☐ Yes/☐ No
20.2	ERP Drills scheduled and practiced quarterly			RP 163 Par. 13.6 ERP drills done quarterly? ☐ Yes/☐ No
20.3	ERP Drill after action reports published and actions closed?			RP 163 Par. 13.7 After action reports written and action items closed? ☐ Yes/☐ No Last drill:
20.4	Does ERP Drill schedule include the following scenarios? 1. Low impact crash/fire. 2. Low impact crash/no fire. 3. High impact crash. 4. Emergency and precautionary landing on the helideck 5. Helicopter ditching near the facility. 6. Engine fire			RP 163 Par. 13.4 Do drills include the scenarios to the left? ☐ Yes/☐ No
20.5	Does the ERP include aviation emergency responsibilities for HLO, HDA, Fire Guard, OIM/ Captain and Radio Operator?			RP 163 Par. 13.6.1 ☐ Yes/☐ No
	Are the procedures adequate?			☐ Yes/☐ No
	Are personnel aware of contents?			☐ Yes/☐ No
20.6	Date of last practice in use of foam agents on simulated fuel spill Date of last drill with foam:			BP
20.7	Date of last practice in use of portable equipment on simulated engine fires Date of last drill with portable equipment on engine fire:			BP

REPORT AND ACTION DISCREPANCIES IF ANY:		
#	**DISCREPANCY**	**ACTION TAKEN**
1		
2		
3		
4		
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Attachment 5 – Helideck Pre-Audit Checklist

Helideck Pre-Audit Checklist			
Installation Name:		Type Facility:	
Location:			
Name of Owner/Operator/Fabricator:			
Email:		Phone:	
Name of person to receive helideck inspection report & follow up non-conformances:			
Email:		Phone:	
Name of Inspector:			
Email:		Phone:	
Proposed Date of Inspection:		Fuel System:	☐ Yes/☐ No

References: The inspection specifications incorporate requirements from the following:
HSAC RPs 161, 162, 163, 164

1. Use of This Checklist: This Helideck Pre-Audit Checklist is sent to the owner/fabricator/operator of the helideck to familiarize with the helideck inspection scope, complete and provide the information prior to the Helideck Inspection in order to reduce time gathering and reviewing documents, plans, procedures and records during the actual inspection. A listing of typical non-conformities found during a helideck inspection is attached at the end of the checklist.

2. Support required:

- **a)** The inspection will take approximately ½ day. A representative from the vessel/installation will be required to accompany the inspector for the duration of the inspection. Preferably this person will be the HLO, but if not, the person must be able direct the inspector to all required equipment, manuals, and records.
- **b)** The helideck must be clear and in serviceable condition or the inspection cannot be done.
- **c)** The information in the checklist below should be provided in advance of the inspection.

3. Coordination required:

- **a)** Access to the facility, vessel or shipyard as applicable.
- **b)** Any personal protective equipment requirements or clearance requirements. The inspector will have a hard hat, heavy-duty gloves, steel-toed boots, safety glasses, fire resistant (FR) work pants and FR long sleeve work shirt.
- **c)** Permission to take pictures of all inspected equipment and areas (Work permit might be needed).

4. The Following items will be inspected:

#	Location	Items
1	**Helideck**	Markings, condition, measurements, gutters, drainage, tie-downs, obstacles, landing net (if installed). perimeter safety net/shelf, lighting (perimeter, status, flood, obstacles, facility, etc), uninterruptible power source (UPS) or rapid response emergency generator
2	**Equipment**	Chocks - quantity, type and condition, tie down strops - quantity, type and condition, prohibited landing marker - quantity, type and condition, windsock - location, condition, lighting. Crash box and contents. Radios, etc.
3	**Structure**	Check for asset integrity and turbulence sources, area should not be obstructed.
4	**Access**	Collapsible handrails, steps, safety notices, access controls. Emergency equipment (breakout boxes) will be inventoried to requirements listed Section 13 of Attachment 4 Should be one breakout box per access point.
5	**Firefighting**	Foam monitors - number, condition and type. Foam hand branches and inductors - quantity, type and condition. Hydrant points and hoses- quantity. Firefighting foam production plant - capacity, type and condition. Complementary (dry powder) system if installed - capacity, type and condition. Portable extinguishers - quantity, type and condition. Storage area for foam concentrate and backup secondary extinguishing media. Ensure stored foam concentrate matches the inductor and monitor settings.
6	**Bridge/ Control Room**	Weather equipment. Radio equipment including helideck team handhelds. Beacon/NDB operating certificate or license (if required by local regulation).
7	**Personal Protective Equipment (PPE)**	Breathing apparatus (minimum of two sets). Quantity, quality and condition of protective clothing: (available for each member of helideck crew).Two-piece suits (bunker coat and trousers) to meet standard EN469 or equivalent, OR One piece suits (preferably orange) to meet standard EN 469 or equivalent. Helmet with full-face visor to meet EN 443 or equivalent. Gloves to meet standard EN 659 or equivalent. Boots to meet standard EN 345 or equivalent. HLO identifying waistcoat: contrasting color to the rest of the helideck crew, flame retardant material, marked with the letters HLO in a reflective material on the front and back. HLO identifying reflective armband (acceptable alternative for use on NUIs). Stowage for firefighting equipment: Clothing should be hung and other equipment stored tidily in a quick access, clean and dry store near the helideck.
8	**Passenger and cargo weighing area.**	Scales - quantity, type and condition. Helicopter emergency information & safety posters. General condition and housekeeping. Cargo and baggage control procedures.
9	**Passenger briefing area**	Pre-flight briefing video media player. Survival suit stowage (if required). Storage area for helicopter medical litter/stretcher. Helicopter emergency information & safety posters.
10	**Training**	Training records and files for HLOs, HDAs. Fireguards, Weather Observers, Fueling Personnel
11	**Manuals, Drawings, Reports, Etc.**	As referenced in Section 1 of the checklist below
12	**Fuel System and Procedures**	If installed, a complete review of the system documentation, procedures and equipment both at deck level and the bulk handling system below deck will be inspected.
13	**Miscellaneous**	Other items as determined necessary by the inspector

#	Specification	Provided ? (✓ if Yes)
1	**HELIDECK DRAWINGS, DOCUMENTS AND REPORTS** (if available)	
1.1	A complete set of scale drawings showing, but not limited to, the following:	Best Practice
	1) General arrangement of the entire Platform/Rig/Vessel with detailed drawing of all helideck fittings, painting, lighting, egress points, and markings.	
	2) Elevation–Clearly showing the installation equipment above helideck level and its relationship to the Limited Obstacle Sector (LOS) and Obstacle Free Sector (OFS).	
	3) Elevation–Clearly showing the installation equipment below helideck level and its relationship to the Obstacle Free Dropdown Sector (OFDS).	
	4) Plan view of helideck with overlays showing the LOS, OFS, and OFDS.	
	5) Wind tunnel testing studies for gas discharges, turbulence, etc., inclusive of prevailing winds to platform orientation.	
	6) Parking areas (if provided).	
	7) Helideck orientations to be shown using predicted Direction of True North and Magnetic North Direction and with prevailing wind in degrees magnetic if a fixed or moored facility.	
1.2	Detail to be shown shall be as follows:	
	1) Helideck dimensions	2) Refueling system (if installed)
	3) All helideck markings, giving dimensions and colors	4) Guttering and drainage system
	5) Helideck landing net location (if installed) and tie-down points	6) Normal and emergency personnel access points
	7) Perimeter safety net/shelf size and supports	8) Windsock(s)
	9) Lighting: perimeter, floodlighting, status, and obstruction	10) Structures that might cause turbulence over the helideck
	11) Location and type of helideck firefighting and crash rescue equipment	12) Hot emission sources, e.g., flares, turbine exhausts
	13) Cold emission sources, e.g., vents, blowdown	14) 210° OFS, 150° LOS & 180° OFDS sectors to be clearly shown
	15) Height of helideck above MSL (mean operating draft)	16) All obstruction non-compliances to be detailed, stating height above/below deck level
1.3	The following reports shall be provided (either original or current version)	
	1) Helideck Commissioning Report and last helideck inspection with record of actions taken to close discrepancies	
	2) Results of Finished Foam Test and Fire Fighting Commissioning	
	3) Fuel System Commissioning and last inspection	
	4) Light Commissioning and Serviceability	
	5) Weather System Calibration	
	6) Weighing Scales Calibration	
	7) Friction Test Certificate	
	8) If safety netting in chain link style, Load Test Certificate	
	9) Daily, Monthly and Annual Helideck Checklists/Reports	
	10) Daily, Monthly, Quarterly, Six-Monthly and Annual Fuel System Checklists/Reports	

#	Specification	Provided ? (✓ if Yes)
1	**HELIDECK DRAWINGS, DOCUMENTS AND REPORTS** (if available)	
	11) Helideck Team Emergency Response Drill reports/records	
	12) Helideck Team Members, Weather Observer & Fuel Handler Training/Qualification/Competence Records	
1.4	The following documents shall be provided:	
	1) Helideck Operations Manual (HOM)	
	2) Helideck Information Plate (HIP) see RP 164	
	3) Helideck Risk Assessments:	
	a) Initial and five-yearly for the helideck and associated systems	
	b) Variances from RP 162 for legacy helidecks, as necessary	
	c) Firefighting, five-yearly	
	d) Emergency Response, initial	
	4) Structural Assessments:	
	a) Structural integrity completed every 5 years	
	b) Incident of damages, as events occur	
	5) Manual/Matrix of Permitted Operations (MOPO)	
	6) Facility Maintenance Manual	
	7) Helideck Daily Status Report	

	Additional Information to be Provided	Response
2	**HELIDECK BASIC INFORMATION** (if available)	
2.1	Shape (square, rectangular, circular, hexagon, etc)?	
2.2	Dimensions?	
2.3	Weight capability?	
3.0	**OPERATIONAL INFORMATION**	
3.1	Type Helicopter in use? Model(s):	
3.2	Helideck Team available?	☐ Yes/☐ No
4.0	**WEATHER SYSTEM IN USE?**	☐ Yes/☐ No
4.1	Model?	
5.0	**FIREFIGHTING**	
5.1	Primary system: (foam, DIFFS, portable, etc)?	
5.2	Quantity primary?	
5.3	Secondary agents (if provided) (CO_2, Dry Powder, etc)?	
5.4	Quantity secondary?	
6.0	**FUEL SYSTEM**	☐ Yes/☐ No

Common Non-Conformities	
Item	**Non-conformance**
Aircraft tie down points	• Bar diameter too large. If diameter is larger than tie down hook then converting shackles to be available on site.
Chocks	• Missing or incorrect number.
Control of passengers	• No access control e.g. chain to stop inadvertent access of passengers onto the helideck.
Drains and curbs	• Full of debris or rubbish. • Drain filters missing. • Does not provide 360° drainage around helideck.
Dress out gear - Boots	• Not EN345/BS1870.
Dress out gear - Fire Tunic	• Not EN469/BS6249.
Dress out gear - Gloves	• Not EN659.
Dress out gear - Helmet with visor	• Not EN443/BS3864.
Dress out gear - HLO/HDA vests	• Not fire resistant
Emergency procedures	• No helicopter specific emergency procedures. • Procedures do not have a complete list of duties (e.g. no duties for the bridge crew on a vessel).
Extinguishers - Dry Powder & CO_2	• Test date expired. • Access to helideck (no ramp and extinguisher is too large or heavy to get upstairs). • No lance for large CO_2 extinguisher
Floodlights –. Connected to UPS	• Often find that lights are connected to an emergency generator that takes 15-45 seconds to come on line. Transfer of load should be immediate.
Foam hand branch	• To be available on site. • Settings to be fixed in order to avoid inadvertent adjustment.
Foam inductors	• Dial is frequently found to be loose.
Foam system - Certificate of Conformity	• Certificate should be available verifying quality of concentrate and foam mixture.
Foam system - Delivery rate	• What is the delivery rate for the monitors? Output should be sufficient such that in the event of a failure of one unit the remaining units can satisfy the requirements.
Foam system concentrate	• Improper concentrations (wrong % concentrate). • Tanks not clearly marked with concentrate % required. • Less than 100% replenishment available
Hand lines	• Sufficient number and length to reach all parts of the deck. • For ease of use there should also be a smaller gauge hose available such as those found in offices.
Helicopter emergency diagrams	• Not posted. • Not the correct type helicopter depicted.
Helideck crew records	• Not comprehensive. • Training records out of date/not current.
Hydrant point	• To be located close to the helideck and capable of supplying water and/or foam.

Common Non-Conformities	
Item	**Non-conformance**
Markings	• Improperly marked (should meet CAP-437 or HSAC RP-2008-01)
NDB	• No certificate for operation. • Crew doesn't know operating frequency. • Antennae infringes obstacle free/falling gradient zones
Passenger/Baggage scales	• Insufficient capacity. • No calibration date. • No calibration plan/local calibration procedures in place
Lights (perimeter, status, flood, obstruction, etc.)	• Often find that lights are connected to an emergency generator that takes 15-45 seconds to come on line. Transfer of load should be immediate. • Bulbs burnt out, lenses cracked, system inoperative.
Perimeter net	• Securing ties are too long. In the event of a tie breaking and unraveling a large section of the net can separate from its frame. • Too taut, no hammock effect. • Material other than uncoated wire mesh or frictape
Prohibited Landing Marker	• Missing. • No way to tie down on helideck. Never been installed.
Rescue equipment	• All there, background lighting and accessibility. • Torch (flashlight) inoperative - batteries dead • Only a single ladder section, need two.
Safety notices	• Missing.
Tie down strops	• Missing or incorrect number. • Poor condition. • Incorrect breaking strength (coordinate with Helicopter Company). • Incorrect hook size (doesn't fit tie down points, never been physically checked).
Weather reporting - Anemometer	• No calibration date. • Wind sensor not in representative location and doesn't indicate wind at helideck. • No handheld anemometer available
Weather reporting - Barometer	• No calibration date. • Analog barometers located in pressurized compartment
Weather reporting - Pitch/Roll/Heave	• Automatic method of electronically measuring and recording actual and historical information required. • No calibration date.
Weather reporting - Temperature	• Temperature sensor not in representative location and doesn't indicate temperature at helideck

Attachment 6 – Helideck Daily Status Report

HELIDECK DAILY STATUS REPORT

Installation Name:		Tel:		Fax:	
Position:		E-Mail:			
Flight No (if available):		Date:		Time Local:	

WEATHER OBSERVATION

Wind Speed (kts):		Winds Gusting :	☐ Yes/☐ No	Gusts (kts):			
Visibility (miles):		Clouds:	☐ Scattered ☐ Broken ☐ Overcast	Cloud Height (ft):			
Air Temp (°F):		Water Temp (°F): *Below 60°F evaluate SAR capability*		Dew Point (°F):		QNH (hPa):	

Other relevant weather information (fog banks, rapid changes, squall lines, etc.):

HELIDECK MOVEMENT for FLOATING DECKS 20 minute interval (Section 8.16 with Table)
Limits shown in table in red text below are for a Category **1** Vessel and a Category **A** helicopter, other Categories will have different values requiring the table with Pitch, Roll, Significant Heave Rate and Inclination to be updated accordingly.

Dynamic Positioning?	☐ Yes/☐ No	Accurate Monitoring Equipment?	☐ Yes/☐ No

Helideck Category (1, 2, or 3): 1		**Helicopter Category (A, B) for helo in use: A**	
Max Pitch (P) ± degrees	Pitch Limit daytime: ± 3 degrees Limit nighttime: ± 2 degrees	Max Roll (R) ± degrees	Roll Limit daytime: ± 3 degrees Limit nighttime: ± 2 degrees
Max Inclination (INC) ± degrees	INC Limit daytime: ± 3.5 degrees Limit nighttime: ± 2.5 degrees	Significant Heave Rate (SHR) ft/sec or m/sec	SHR Limit daytime: 4.3 ft/sec Limit nighttime: 3.3 ft/sec

Wave height (feet):		Heading if a Vessel/FPSO (degrees):		Sea Spray on helideck?	☐ Yes/☐ No

SUPPORTING INFORMATION

Support Equipment Available:			☐ Y	☐ N	**Return Load** (if planned):		# Passengers
Fuel Quantity:		gallons	☐ Y	☐ N	Total weight:		pounds
NDB:		ID	kHz	☐ Y	☐ N	Luggage (incl. in total):	pounds
VHF:		MHz	☐ Y	☐ N	Cargo (incl. in total):		pounds
Weather Station:			☐ Y	☐ N	Special Requirements? See Remarks section below.		

Remarks (include any changes in helideck condition/status/limitations):

Routing:	1:		2:		3:		4:

APPENDIX 4 - FUEL SYSTEM DESIGN, MAINTENANCE AND INSPECTION REQUIREMENTS

Attachment 1 – Fuel System Design

14 FUEL SYSTEM DESIGN - GENERAL

It is essential to ensure at all times that aviation fuel delivered to helicopters from offshore installations and vessels is of the highest quality and delivered clean, dry and on jet fuel specification.

15 FUELING SYSTEM DESCRIPTION

Offshore fueling system design may vary according to the particular site-specific application, two examples are shown in Figure 13 below. However, essential elements of all offshore fueling systems shall include the items listed below:

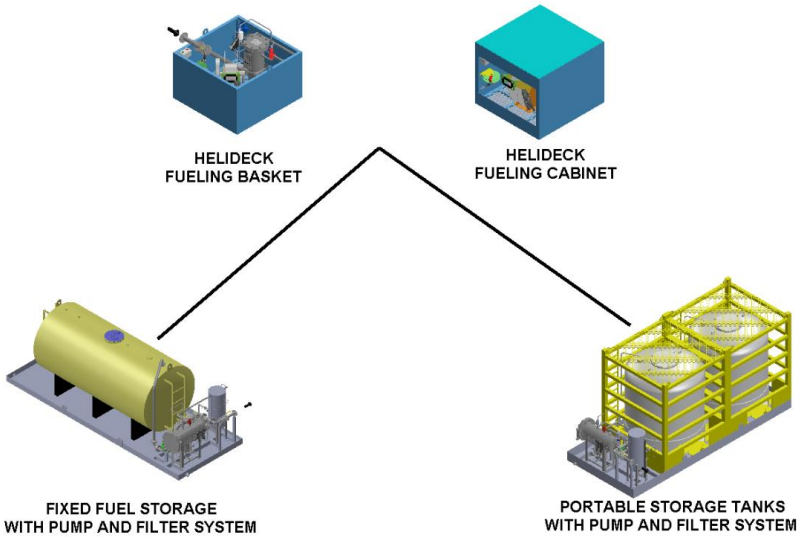

Figure 13: Basic Fuel System

15.1 Tank Options (see Terms and Definitions):

15.1.1 Fixed Fuel Storage Tank refilled using a Transit Fuel Tank and, if installed, a sample Reclamation tank.

Note: In systems with a Fixed Fuel Storage tank, fuel must be filtered into and out of the tank. There should be not gravity filling without filtration.

Figure 14: Transit Fuel Tank

15.1.2 Portable Fuel Storage Tank used to both transport and serve as fuel supply tank until empty

Figure 15: Portable Storage Tank

15.2 Fuel Pumping and Filtration System

15.3 Fuel Delivery System (which may include a meter)

15.4 Fuel Sample Reclamation Tank

Note: In systems with a fixed Static Fuel Storage tank, fuel must be filtered into and out of the tank

16 GENERAL DESIGN CONSIDERATIONS

When preparing a layout design for aviation fueling systems on offshore installations and vessels it is important to make provisions for suitable segregation and creating a bund around the areas set aside for the tankage and delivery system. Measures for containing any possible fuel leakage and providing fire control shall be given full and proper consideration, along with adequate protection from potential dropped objects (e.g. due to crane operations).

16.1 Labeling and Placarding

16.1.1 Fuel Labeling

Clear and unambiguous product identification shall be marked on all fueling system components and pipelines denoting the Jet Fuel type (e.g. Jet A). Details can be found in API/IP Standard 1542 "Identification markings for dedicated aviation fuel manufacturing and distribution facilities, airport storage and mobile fueling equipment". The correct identification markings shall be initially applied and routinely checked for clarity during maintenance inspections.

Figure 16: Jet A-1/Jet-A identification markings

16.1.2 HAZMAT/DOT Placards

Placards shall be provided on Transit/Fixed/Portable fuel storage tanks and Fuel System Delivery Cabinet. In addition to Jet A fuel (see 16.1.1), "No Smoking" and "Flammable" placards, DOT Fire Triangle with 1863 designation, and HAZMAT Product Grade placards are required (samples below).

Figure 17: DOT Placard 1863

Figure 18: HAZMAT Placard

16.1.3 Fixed Fuel Storage Tanks

Where static storage tanks are provided they shall be constructed to suitable Underwriter's Laboratory (UL) standards (UL 142 and UL 2085) and a have UL listing. The tank shall be cylindrical and mounted with an obstacle free center-line slope (e.g. no baffles fitted) to a low point drain sump. This slope shall be at least 1 in 30.

Tanks may be constructed from stainless steel or mild steel. If mild steel is used, then the tanks shall be internally lined with a suitable light colored, aviation fuel-resistant epoxy surface finish. An acetone test and/or "soak test" shall be performed on new linings.

The sump shall be fitted with a stainless-steel sample line which has a double block valve arrangement utilizing a spring-loaded ball valve and it shall have a captive dust cap on the end to prevent the ingress of dirt or moisture.

Stainless Steel Sample lines shall be a minimum of ¾" (20 mm), but preferably 1" (25.4 mm) diameter and have adequate clearance for sampling jars.

Fasteners and fittings shall be stainless steel.

Plumbing should be stainless steel and connections should be welded (where possible).

The tank shall incorporate an integral "ladder" for access to the tank top, and a top work platform with side safety barriers to enable inspection and entry to the tank.

The tank shall be bonded to the system piping.

The date of the initial and next-due static grounding check (annual) shall be stamped on a metal tag attached to the tank next to the data plate.

Tanks shall be properly labeled regarding contents, fire protection, and hazard.

Fixed fuel storage tanks shall be equipped with the following:

a) **Manhole.** An 18" (450 mm) or greater diameter manhole which should normally be hinged to assist easy opening.
b) **Contents Measuring Device.** A suitable dipstick or dip-tape shall be provided, with a means of access to the tank interior. Additionally, a sight glass or contents gauge may be provided to determine the tank volume.
c) **Vent.** A free vent or an emergency pressure/vacuum relief valve shall be fitted. Type and pressure settings shall be in accordance with the manufacturer's recommendations.
d) **Fill Connection.** Connections of transit tanks shall be made at the inlet side of the pump and all delivered fuel will be added to the tank through filtration. Piping into tank will be arranged so that there is no free-fall of product at any stage of the tank replenishment.
e) **Floating Suction. F**loating suction ensures fuel is always being drawn from the top, a bonded floatation check wire (which provides grounding and ability to test floatation) pull assembly shall be fitted and accessible from the top of the tank. In addition to the check wire, a foot will be installed to ensure the Floating Suction draw-off point will be at least 6" (150 mm) higher than the lowest point of the tank.
f) **Tank Shell Outer Surface Finish.** The static storage tank shell shall be suitably primed and then finished to provide optimal corrosion protection. Where the tank shell is fabricated from stainless steel it may remain unpainted. All component parts shall be properly bonded before being painted. Whether the tank barrel is painted or stainless-steel, Jet A static storage tanks shall be correctly identified by placing clear product identification markings on all sides in accordance with NFPA 704, particularly at all connection points
g) **Tank Shell Inner Surface Finish.** The internal finish shall be sufficiently smooth to ensure that liquid run-off is clean.
h) **Automatic Closure Valve**: The delivery and suction inlet and outlets shall be fitted with automatic quick closure valves capable of operation from both the helideck and from another point located a safe distance from the tank.
i) **Identification Plate:** The tank's initial and next-due (annual if mild steel, every 2 years if stainless steel) inspection date shall be stamped on the data plate. The tank capacity and serial number shall be clearly and permanently marked on the Identification Plate.
j) **Tamper Proof Seals:** All tank openings shall have witness seals to verify that the contents have not been tampered with after refilling.
k) **Fire Protection:**
    1) The tank storage area shall be provided fire protection meeting the requirements of local regulation. Where none exist, a water deluge system shall be provided. A portable fire extinguisher shall also be available adjacent to the system.
    2) The tank shall be contained inside a bund capable of holding the contents of the tank to provide protection against fuel spills and leakage.
    3) The bund shall have a water draining capability. It is recommended that this be locked when not in use.

17 PORTABLE FUEL STORAGE TANKS

17.1 General

Portable fuel storage tanks shall be constructed to satisfy the requirements of Intergovernmental Marine Consultative Organization (IMCO) and International Maritime Dangerous Goods (IMDG) Codes and current inspection and repair codes of practice (EN 12079/EN ISO 10855).

Tanks may be constructed from stainless steel or mild steel. If mild steel is used, then the tanks shall be internally lined with suitable aviation fuel-resistant epoxy lining.

The tanks shall be encased in a robust steel cage with four main lifting eyes and, where possible, stainless steel fasteners in conjunction with stainless steel fittings should be used. The tank frame shall incorporate cross-members to provide an integral 'ladder' access to the tank top.

When horizontal vessels are mounted in the frame there shall be a tank center line slope towards a small sump. Vertical vessels shall have dished ends providing adequate drainage towards the sump. This slope shall be at least 1 in 30.

Tanks should also be clearly marked with the date of the last lifting gear including the lifting point lugs inspection, and initial IMDG pressure test.

17.2 Tank Identification Plate

The date of the last and next-due (5 years) hydrostatic test shall be marked on the data plate.

The tank's serial number shall be permanently marked on the data plate.

The tank's last and next-due (5 years with 2.5 year interim inspection) certification date shall be marked on the data plate.

17.3 Additional Equipment

Tanks shall normally be equipped with the following:

a) **Manhole.** An 18" (450 mm) or greater manhole to allow physical access to the interior of the tank.
b) **Inspection Hatch.** If the manhole position and/or cover type is unsuitable for inspecting the lower end of the tank, a 6" (150 mm) hatch shall be fitted to enable inspection.
c) **Dipstick Connection.** A suitable captive dipstick to determine the tank contents.
d) **Emergency Pressure Relief.** A stainless steel 2½" (63.5 mm) pressure/vacuum relief valve fitted with weatherproof anti-flash cowl. The valve settings will depend on the type of tank in use and manufacturers' recommendations shall be followed. The date of the initial and next-due (annual) pressure test calibration shall be permanently attached to the pressure relief valve (PRV).
e) **Sample Connection.** A stainless-steel sample point will be fitted at the lowest point of the tank. A spring loaded valve with dust cap shall be fitted in the fuel sample line. Sample lines shall be a minimum of ¾" (20 mm), but preferably 1" diameter. In order to allow a standard sample jar to be used, the sample point shall be designed with sufficient access, space and height to accommodate the sample jars.
f) **Outlet/Fill Connection.** The outlet/fill connection shall be a flanged fitting with a 3" (76 mm) internal valve terminating to a 2½" (63.5 mm) self-sealing coupler complete with captive dust cap. The draw-off point for the tank outlet shall be at least 6" (150 mm) higher than the lowest point of the tank.

g) **Document Container.** A suitably robust container shall be positioned close to the fill/discharge point to hold the tank and fuel certification documents.
h) **Tank Barrel and Frame External Surface Finishes**. The tank barrel and frame shall be suitably primed and then finished in safety yellow (BSI BS 4800, Type 08E51 or equivalent). Where the barrel is fabricated from stainless steel it may remain unpainted. All component parts, e.g. tank, frame etc., shall be properly bonded before being painted. Whether the tank barrel is painted yellow or otherwise, Jet A Portable Fuel Storage Tanks shall be correctly identified by placing clear product identification markings/placards on all sides, particularly above the tank filling and dispensing attachment.
i) **Tank Shell Internal Finish.** The internal finish shall be sufficiently smooth to ensure that liquid run-off is clean and allow the tank to be wiped down during internal inspections without dragging threads or lint from the cleaning cloth.
j) **Tamper Proof Seals.** All tank openings shall have witness seals with "Fill Date" to ensure rotation of inventory and verify that the contents have not been tampered with after refilling.

17.4 Transit Tanks

a) **Shell.** Tanks shall be constructed from 10 gauge (.135"/3.4 mm), 304 stainless steel with 2B finish with a one-piece 1-1/2" (3.81 cm) sloped bottom.
b) **Discharge Valve.** The tank shall have a 2 in. (5.08 cm) discharge valve with an external pipe selective connection.
c) **Lifting Lugs.** Heavy-duty lifting lugs and leg positioners on top the tank (for stacking tanks). Tanks should also be clearly marked with the date of the last lifting gear including the lifting point lugs inspection, and initial IMDG pressure test.
d) **Manhole.** 22-5/16" (56.6 cm) top opening/manhole with 3" (7.62 cm) fill port, EPDM gasket, Zinc plated bolted clamp ring, formed neck.
e) **Vent.** 2" (5.08 cm) top pressure vacuum vent with a release pressure of 5 PSI pressure for filling or temperature increase, O.5 PSI vacuum when fuel is withdrawn
f) **Legs at Bottom of Tank** shall radius corner legs with caps that are 2" high (16.6 cm)
g) **Tank Bottom Lifting Points** shall consist of two way fork lift channels on the bottom of the tank.
h) **Identification Plate.** The tank's initial and next-due (annual if mild steel, every 2 years if stainless steel) inspection date shall be stamped on the data plate. The tank capacity and serial number shall be clearly and permanently marked on the Identification Plate.

18 FUEL SAMPLE RECLAMATION TANK

18.1 General

18.1.1 Requirements

If the fueling system includes a fixed static storage tank, water-free and sediment-free fuel samples can be disposed of into a dedicated reclamation tank (if installed). The sample reclamation tank shall be equipped with a removable 100 mesh strainer at the fill point, a lockable sealing lid, a conical base with a sample point at the sump and a return line (fitted with a check valve) plumbed to the suction side of the pump, upstream of filtration. ATA-103 "Fuel Reclamation" provides the necessary specifications.

A Fuel Reclamation storage tank, where installed, shall include the following:

a) Gauge hatch with slotted tube.
b) Means for access or visual inspection.
c) Means to prevent overfill.
d) Suitable secondary containment as applicable.
e) A placard, adjacent to tank sump drain(s), indicating the volume of tank drain piping
f) The tank must be identified as "Jet A Recovery Tank Intended for Aviation Use".
g) The tank must have sloped bottom to a positive sump with a drain or permanent pump.
h) The sump must be located in the lowest point of the tank.
i) The drain or pump pick-up must be at the lowest point of the sump.
j) All tank appurtenances, access entrances, vents, inspection ports, etc., must on the top of the tanks.
k) Reclaimed fuel except from sump separators, must be filtered prior to return to storage.

18.2 Fuel Sample Reclamation Tank Interior Inspection

On a quarterly basis Fuel Sample Reclamation tanks must be visually inspected for cleanliness or pass a microbiological growth test and be cleaned as required in ATA-103

> **Note:** Where the system does not include a functioning static storage tank and fueling is direct from transit tanks and a sample Fuel Sample Reclamation Tank has been installed, fuel samples may be drained to the Fuel Sample Reclamation Tank.

19 DELIVERY SYSTEM

The delivery system to transfer fuel from storage tanks to the aircraft shall include the following components:

19.1 Pump

Where practicable, systems shall be designed to incorporate a twin pump skid in order to provide redundancy in case one pump should fail in service. This may not always be possible due to space constraints.

The pumps shall be electrically or air driven, centrifugal or positive displacement types with a head and flow rate suited to the particular installation.

> **Note:** Consideration should be given to the option for an alternate power source to any pump type selected in an effort to address situations where operations will be reinitiated after evacuation due to a severe weather event or emergency and the main generator system may not be on-line/available to power the pump.

The pump(s) shall be able to deliver up to 60 GPM (225 liters) per minute under normal flow conditions. The pump shall be able to deliver 3.45 bar (50 psi) no flow pressure (with the delivery nozzle closed).

Pump shall have a Y-strainer with 60 mesh screen on the inlet side to capture contaminants.

A remote start/stop control shall be provided on or immediately close to the helideck and close to the hose storage location (in a position where the operator is able to access during the entire fueling operation).

Additionally, there shall be a local emergency fuel stop control adjacent to the pump(s). A dead-man switch solution where release of this switch during refueling operations results in stopping the pump is also acceptable. Re-engagement of a dead-man switch should not result in the pump be turned on. The circuitry shall be set-up to only start pumps when both the start/stop button and the dead-man switch are activated at the same time.

19.2 Flow Meter (when installed).

If a fuel flow meter is used, it shall be of the positive displacement type, positioned upstream of the filtration and sized to appropriate to the system's flow rate.

The flow meter shall include a strainer and an air eliminator.

19.3 Filtration (see Definitions).

System filtration shall either consist of a two components, where first and second stage filtration takes place within a filter water separator vessel and third stage filtration takes place within a fuel monitor, or alternatively a single unit design may be used in the form of a combined three-stage filter unit. Filtration units shall meet the following criteria:

19.3.1 Common to All Filtration Assemblies:

a) Filter units, including micro-filters, water separators, and fuel monitors, shall be fitted with automatic air eliminators and pressure relief valve and sized to suit the discharge rate and pressure of the delivery system.
b) Filters shall be sized to suit the discharge rate and pressure of the delivery system.
c) Filter units shall be fitted with a sample line at the lowest point of the vessel to enable contaminants to be drained from the unit while under pressure. The stainless-steel sample line shall terminate with a spring-loaded ball valve and have a captive dust cap. Stainless steel Sample lines on filter units shall be a minimum ½" (13 mm) nominal bore.
d) Filters for Filter Water Separators or Combined Three-Stage Filter Units shall be EI 1581 and for Fuel Monitors shall be EI 1583 (latest editions) and provide protection down to 1-micron particle size or better.
e) Direct reading differential pressure gauges with an accuracy of +/- 2 PSI with the ability to be tested and preferably with a "peak-hold" feature.
f) Manual sump drains - Valves with handles spring loaded to the closed position are recommended
g) Upstream and downstream Filter Membrane Evaluation sampling connections (Millipore), including probes and dust caps or plugs.
h) The filter vessel assemblies shall be labeled with the initial and next-due (12 months) change date.

19.3.2 Fuel Monitor.

Figure 19: Sample Fuel Monitor

The monitor is described as an Aviation Fuel Filter Monitor with absorbent type elements and shall be fitted with a pressure relief valve in addition to the automatic air eliminator.

Filter Monitors are designed to filter for particulates and absorb any water present in the fuel resulting in the dramatic reduction to the flow of fuel if the amount of water in the fuel exceeds an acceptable limit compromising fuel quality. Any reduction of fuel flow will be identifiable by an increase in Differential Pressure.

19.3.3 Filter Water Separator.

Figure 20: Sample Filter Water Separator

Filter/Separators must be equipped with an automatic water defense system that will stop fuel flow when actuated by a high-water level condition. This may be a float or electronic probe assembly with maintenance procedures as described in below.

a) Float or electronic probe systems must include provisions for a quarterly operational test.
b) If a probe is used, and the fuel contains anti-icing additive, the control must be able to detect a water/additive mix.

19.3.4 Combined Three-Stage Filter Unit (sometimes called a Filter "Vessel").

Figure 21: Sample Three Stage Filter Unit

Combined three-stage filter units shall incorporate first-stage Coalescer elements, second-stage separator elements and third-stage monitor elements within a single filter vessel unit.

Units shall be EI 1581 (latest edition) approved and such filters shall provide protection down to 1-micron particle size or better.

Third-stage monitor elements shall be EI 1583 (latest edition) approved and be designed to absorb any water still present in the fuel and to dramatically reduce the flow of fuel if the amount of water in the fuel exceeds an acceptable limit compromising fuel quality.

Dual direct read differential pressure gauges shall be fitted in order to provide a means of monitoring element condition during operation. One gauge shall be set up to measure first-stage element condition with the other set up to measure third-stage element condition. The differential pressure generated across the second-stage element is insignificant and can therefore be measured combined with either first-stage or third-stage, depending on the vessel design.

19.4 Delivery Hose

The delivery hose shall be an approved semi-conducting type to EI 1529 Grade 2, Type C, fitted with permanent end fittings.

The hose shall have a 1½ in. (38 mm) internal bore fitted with reusable safety clamp adaptors (hoses of larger diameter may be required if a higher flow rate is specified).

The hose shall be stored on a reel suitable for the length and diameter of the hose being used. The selected length of refueling hose provided shall be consistent with easily reaching the helicopter refueling points when the aircraft is correctly positioned on the helideck.

If the delivery hose reel is below helideck level (e.g. in a fueling pit) the use of roller guides on the deck edge (not exceeding height above helideck as mentioned in paragraph 7.3.5..3 and 7.3.5.4) shall be considered to minimize damaging the delivery hose while reeling it in or out.

Fuel markings (black and white) shall be applied to the delivery hose.

The hose shall be documented with the initial and next due (2 years, and 10 year life from date of manufacture, with a monthly hydrostatic test) change date.

19.5 Bonding Cable

A suitable high visibility bonding cable shall be provided to electrically bond the helicopter airframe before any fueling commences.

The electrical resistance between the end connection and the system pipework shall not be more than 0.5 ohms.

The selected length of bonding cable provided shall be consistent with easily reaching the helicopter refueling points when the aircraft is correctly positioned on the helideck.

The bonding cable connector shall be suitable for the aircraft type(s) being fueled at the facility.

The cable shall be fitted with a quick release/break away earthing adaptor to attach to the aircraft and the cable shall be kept on a reel with an automatic rewind mechanism.

19.6 Bonding Safety Systems.

The pumping system shall be equipped with an automatically switched, flashing “pump-running” warning beacon that is visible from the helideck to clearly show that the fuel delivery pump is engaged and running. This flashing

beacon shall be amber colored to distinguish it from other helideck lighting and to ensure it is visible against the general installation lighting.

The height above the helideck shall not exceed the limits in paragraph 7.3.5.

Ideally, there shall be an automatic interlock (e.g. an earth proving unit) that prevents the pump from running and the pump-running warning flashing until such time as there is positive earth bonding established between the aircraft and the refueling system. For operational reasons, it shall be possible to run the system by earthing the interlock to something other than an aircraft in order to draw daily samples and carry out maintenance activities.

Although one side of this type of earth loop will be connected to the control circuit, the electrical resistance between the end connection of the second side of the loop and the system pipework shall not be more than 0.5 ohms.

The selected length of cable provided shall be consistent with easily reaching the helicopter refueling points when the aircraft is correctly positioned on the helideck.

Note: Regardless of the status of the automatic 'earth proving' interlock that prevents the pump from running and the pump-running warning beacon flashing, the flight crew and HLO remain responsible for ensuring that the bonding cable has been disconnected from the aircraft and properly stowed at the conclusion of the fueling operation.

19.7 Fueling Nozzle.

Fuel delivery to the aircraft may be either by Gravity (Overwing nozzle) or Pressure fueling (Single-Point/underwing) nozzle. It is operationally advantageous to have the ability to refuel by either means to suit the helicopter type in use.

19.7.1 Gravity

The nozzle shall be 1½" (38 mm) spout diameter fitted with 100 mesh strainer. These nozzles may not have any type of "hold open" device. Suitable types include the OPW 295 and EMCO G457 refueling nozzle as well as the Schultz Helicopter Refueling Nozzle.

19.7.2 Pressure

For pressure refueling the coupling shall be 2½" (63.5 mm) with 100 mesh strainer and quick disconnect. Any Single Point pressure refueling nozzle shall be equipped with a Hose-End Pressure control having a maximum regulated surge control pressure of 35 psi (maximum 241.3 kPa).

> **Note:** To meet both requirements of converting from a gravity nozzle to a pressure nozzle, the hose-end can be fitted with a "dry-break" coupling. Alternatively, a separate short length of hose fitted with the adaptor and the Single Point Nozzle permanently affixed to the end. When converting from a Gravity nozzle to Single Point nozzle, there must be an ancillary means of dead man flow control incorporated into the system.

19.8 Fuel System Dispensing Cabinet or Basket

19.8.1 The fuel dispensing system whether a cabinet or basket design should include:

a) Fueling hose that can be fully contained into the basket or cabinet preferably using a hose reel
b) Filtration (basket will include a filter monitor)
c) On/Off Pump Control Switch
d) Fuel Flow control valve

e) Explosion proof amber operating light outside the cabinet/basket
f) Proper placards and labels.

19.8.2 The fuel dispensing system using a cabinet should additionally include:

a) Adequate weather protection to prevent deterioration of hoses and ingress of dust and water.
b) Access doors or shutters, and with provision for the storage of sample jars, water-detection capsules, and fuel control documentation.
c) Explosion proof observation light inside the cabinet

Attachment 2 – Fuel System Maintenance Requirements

#	Area of Maintenance	Preventive/Corrective Actions	Frequency (Reference)
1	**Fuel Dispensing Unit**		
1.1	**Maintenance Procedures**	Written instructions shall be provided for the following: 1) Quality assurance testing and recording during refueling 2) Retention of water samples 3) Refueling records 4) System breakdown/troubleshooting 5) A formal Maintenance Inspection Schedule shall be provided and the following information shall be recorded in the Installation Preventative Maintenance Schedule, or equivalent, including the following: a. Daily Checks b. Monthly Checks c. Quarterly Checks d. Three-Monthly Checks e. Six-Monthly Inspection/Maintenance f. Annual Inspection/Maintenance g. Calibration and testing (including static ground tests) for transit tanks and associated facilities)	As Specified
1.2	**Entire System**	Test and document for proper operation, pressures, etc, remedy any discrepancies.	Daily
		Inspect on an annual basis, with report retention, and discrepancies remedied in a timely manner	Annual
		See the Inspection Checklists for fuel systems Appendix 4, Attachments 3-9	
1.3	**Nozzle(s)**	Nozzle screen (gravity feed) if not clean and clear; clean. Nozzle cap or chain if missing; replace. Grounding cable if frayed or damaged; repair/replace.	Monthly ATA 103, 2.3.5.6
		Pressure refueling nozzles, maintain to manufacturer specifications.	As Specified
1.4	**Hose**	If not marked to API 1529 specification; replace	As Needed
		Hose: if cracked, weather checked or heavily worn; replace	As Needed
		Hydrostatic test of hose is required when the hose clamps are reusable, by rolling hose out to full length, turn pump on to pressurize hose. Keep hose pressurized for 15 minutes while checking for any deformation of the hose. If hose passes, continue use, if it fails replace, results recorded.	Six Months ATA 103, 2.5.6.1 RP 163 Par. Attmnt 2, 1.3
		Replace hose if date on the hose exceeds recommended life. If hose is not hydrostatically tested every 6 months; replace at 5 years.	10 Years
1.5	**Gauges, meters, pressure relief valves**	Check Meters for proper operation.	Monthly
		All gauges, meters, and pressure relief valves shall be calibrated annually and certificates provided.	Annual
			ATA 103, 2.9.5.2

#	Area of Maintenance	Preventive/Corrective Actions	Frequency (Reference)
1.6	**Differential Pressure Checks**	Readings should not exceed 15 psi at rated flow of the filter vessel unit, if in excess; troubleshoot filtration and repair/replace as necessary until reading are in normal range. Readings are recorded in the daily logs. **Note:** A reading of zero indicates filter is in bypass and filter should be replaced immediately take system out of service until filter has been replaced.	Daily ATA 103, 2.9.4.2
		Annual calibration required	Annual ATA 103, 2.9.5.2
1.7	**Continuity**	Retractable bonding cable: if not functional; repair and replace	Daily
		Continuity checked for all system components inclusive of nozzle grounding cable, retractable bonding cable at less than 0.5 ohms and recorded in records, if more than 0.5 ohms take system out of service until bonding is remedied.	Monthly
			(ATA 103, 2.9.4.3
1.8	**Fuel Filters (water blocking mandatory) and Fuel Water Separator Units**	Change Fuel Filters: filter canister marked with date changed and next due. Copy of filter record in files.	Annual ATA 103, 2.8.2.1
		Filter/Separators: automatic water defense float or electronic probe systems must include provisions for a quarterly operational test. **Note:** If a probe is used, and the fuel contains anti-icing additive, the control must be able to detect a water/additive mix.	Quarterly
1.9	**Sampling of fuel filters, tanks, hose nozzle**	Tanks: Drain samples prior to first refueling into separate one quart or one liter wide mouthed glass containers.	Daily
		Filters: Pressurize system and sump until the samples are clean and free of water. Use stainless steel bucket initially then sample jars. Open sump valve completely while sumping to create a venturi effect in the tank.	
		Test samples for water and retain ALL samples until the next day. Update daily fuel system records.	
			ATA 103, 2.9.3.2
1.10	**Filter Membrane Evaluation**	Perform Filter Membrane Evaluation downstream of filter, document findings. (if the filter vessel is equipped for the test)	Monthly ATA-103, 2.5.4.1
1.11	**Fuel Reclamation Tank**	Fuel Sample Reclamation tanks must be visually inspected for cleanliness and pass a microbiological growth test and be cleaned. **Note:** Where the system does not include a functioning static storage tank and fueling is direct from transit tanks and a sample Fuel Sample Reclamation Tank has been installed, fuel samples may be drained to the Fuel Sample Reclamation Tank.	Quarterly ATA 103, 2.5.3.3

#	Area of Maintenance	Preventive/Corrective Actions	Frequency (Reference)
2	**PUMP(S)**		
2.1	**Pump running warning light (yellow or amber)**	Pump light within sight of refueler inoperative, repair/replace	Daily
2.2	**Stop/start buttons**	Buttons located adjacent to equipment within the sight of the refueler if not operating properly or waterproof covers torn, repair/replace	Daily NFPA 407-17, 6.1.6.6
		A deadman switch for use by HLO might be installed and shall be tested daily.	Daily NFPA 407-17, 6.1.6.6
		Emergency shut off tested and if not functioning properly, take system out of service until repaired	Six Monthly ATA-103, 2.5.5.1
2.3	**Pressure gauge(s)**	Calibrate and certify	Annual ATA 103, 2.9.5.2
2.4	**Other**	Perform additional maintenance as specified by the manufacturer	As Specified
3	**All Tanks (Transit, Portable Storage, and Fixed Storage)**		
3.1	**Pressure relief valves for Portable Storage Tanks**	Calibrate and certify	Annually ATA-103, 2.4.3
3.2	**Bonding**	Verify tanks is bonded to ground, if not; reground	Daily
		Continuity checked at less than 25 ohms and recorded in records, if more than 25 ohms take system out of service until bonding issue is remedied.	Monthly
			ATA 103, 2.9.4.3
3.3	**Floating Suction on Fixed Storage Tanks**	Ensure floating suction arm is free floating by pulling up lightly on cable. Make sure cable is connected securely to pipe or cap. If not free floating or cable is not connected; take tank out of service and repair.	Monthly ATA-103, 2.4.2
3.4	**Fuel age**	The maximum time fuel can be stored in tanks unless at least 50% of the fuel has been refilled in the same tank is six months. After that time, the fuel must be replaced or subject to a Periodic Test (JIG Standard 1530) confirming the fuel specifications are still in line with the original fuel delivery certificate. The Periodic Test sample size should be at last 2 quarts and it should be shipped to the laboratory in a metal container epoxy lined and approved for jet fuel. After completion of the testing confirming satisfactory results, a certificate	Six Months

#	Area of Maintenance	Preventive/Corrective Actions	Frequency (Reference)
		should be supplied and stored on site until the test is next due or the fuel is replaced.	JIG 1530
4	**Transport Tanks**		
4.1	**Maintenance Program**	A formal Maintenance Inspection Schedule shall be provided incorporating at least the checks below. The results and next due dates will be recorded in the Installation Preventative Maintenance Schedule: 1) Trip Inspection 2) On Receipt Inspection 3) Six & 12 Monthly Inspection/Maintenance 4) Recertification 5) Calibration and testing (including static ground tests) for transit tanks and associated facilities	As Specified
4.2	**Maintenance Procedures**	Written instructions shall be provided at the dispatch end and at the receiving end (offshore) for compliance for: 1) Filling of Transit Tanks Onshore 2) Receipt of Transit Tanks Offshore 3) Decanting From Transit Tanks To Static Storage Offshore 4) Fueling From Transit Tanks Offshore 5) Written instructions shall be provided at the receiving end (offshore), for compliance with Fuel Quality Control procedures.	As Specified
4.3	**Seals, hatches, caps, openings, labels**	If frangible opening seals are missing or broken; test contents.	Daily
		If within specification; reseal.	
		If contents cannot be verified; return to shore for refilling.	
		If opening seals, hatches, caps, labels are damaged; repair/replace.	Monthly
4.4	**Owner Recurring Inspection**	Maintain a record of tank inspection and cleaning using ATA Form 103.07 or similar. Tank interior must be clean, free of rust, water and sediment and all opening seals, hatches, caps, etc serviceable, if not clean; repair or replace as necessary. Tank, if lined, should have the liner intact, if not; repair or replace tank.	ATA-103, 2.5.2
		Carbon steel inspection interval:	Six-Monthly
		Stainless steel inspection interval:	Annual
4.5	**Dept. of Transportation Inspections**	Intermediate Inspection to DOT specifications.	2½ years
		Transport Tank Recertified to DOT specifications by a certified specialist.	5 years
		Dates recorded on tank data plate, if missing; re-inspect if records cannot be located.	As Needed
			49 CFR, 180 G

#	Area of Maintenance	Preventive/Corrective Actions	Frequency (Reference)
5	**Fixed Fuel Storage Tanks**		
5.1	**Maintenance Program**	A formal Maintenance Inspection Schedule shall be provided. The following information will be recorded in the Installation Preventative Maintenance Schedule or Company-approved equivalent:	
		1) Six-Month Inspection/Maintenance	Six-Monthly
		2) Annual Inspection/Maintenance	Annual
		3) Calibration and testing (including static ground tests) of tanks and associated facilities.	Annual
5.2	**Maintenance Procedures**	Written instructions shall be provided at the receiving end (offshore) for compliance with quality control procedures.	As Specified
5.3	**Tank Inspections**	The tank's last and next due (inspection) date shall be stamped on the data plate.	ATA-103, 2.5.7.1
		Mild Steel:	Annual
		Stainless Steel:	Two-Yearly
5.4	**Static Grounding Check**	The date of the last and next-due static grounding check (annual) shall be stamped on a metal tag attached to the tank next to the data plate.	Annual
			ATA-103, 2.8.14
5.5	**Fuel Microbe Testing in Bulk Storage Tanks**	Fuel should be tested initially for a "normal baseline level" and then retested as still within those "normal" baseline levels. Six month testing preferred, especially where sumping is infrequent such as with transit tanks or fuel usage is slow.	Annual
			ATA-103, 3.7
6	**FIRE FIGHTING (NFPA 407)**		
6.1	**Fire Extinguisher Type (BC), with minimal size of 30 pounds required.**	If fire extinguisher pressure gauge needle is not in green arc; replace. If safety wire is broken or inspection tag is missing; have unit re-inspected and wire or tag replaced	Daily
			ATA 103, 2.5.3.8
		Inspected by a qualified technician and tag marked	Monthly and Annual
7	**SAFETY**		
7.1	**Signage and Labeling**	Signs for: No Smoking, Flammable, Jet Fuel, Emergency Shut Off, Direction of Flow, etc. Labeling on all tanks, piping, etc for jet fuel. If faded or damaged; repaint/replace	As Needed
			ATA 103
7.2	**SDS Sheets**	SDS sheet for jet fuel: if not readily available/readable, replace.	As Needed
7.3	**Eyewash Station**	Eyewash station should be serviceable with water full, if not: replace and update records.	Daily
		Verify proper function and update records	Monthly
7.4	**Spill Response**	If adequate supplies are not readily available; replace	Daily
7.5	**Protective Equipment**	If goggles are not available or heavily crazed; replace. Fuel resistant gloves if not clean or available; replace.	Daily

Attachment 3 – Daily Fuel System Checklist

D Daily Fuel System Checklist

Facility:		Month:		Fuel Type:		No. of Tanks:	

	Daily Action	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1	Inspect General Condition of Entire Fuel System																															
2	Fire Extinguishers Check																															
3	Security and Seals Check																															
4	Spill Kit, Eyewash Check																															
5	Sample Tank Sumps and Record Findings*																															
6	Pressurize System and Check for Leaks, Check Light																															
7	Sump Filters, Nozzle, and Record Findings*																															
8	System Flow Rate Record																															
9	Filter Differential Pressure, Record Actual PSI Reading																															
10	Inspect Hoses, Swivels, Seals, Nozzle End & Screen																															
11	Check Grounding Reels, Cables and Clamps, Bonding																															
√	Mark if any discrepancies and record on form & actions taken																															
	Approval initials:																															

Findings Legend (excluding items 5, 7, 8 and 9): **S**=Satisfactory, **X**=Unsatisfactory, **N/S**=Not in Service, **N/A**=Not Applicable

*** Items 5 and 7:** Record Results (number & letter): **Solids** (1) Clear, (2) Slight Particulate, (3) Light to Medium Particulate, (4) Dirty **Water** (A) Bright, (B) Hazy, (C) Cloudy, (D) Wet

Instructions:

1. Check area in and around fuel storage facility for items out of place, hazards, debris or safety concerns. Report items of concern to your supervisor. Verify goggles and gloves available.
2. Ensure fire extinguishers are properly placed at exit points and are unobstructed and tamper seals are intact, gauge in green arc, inspection tags attached and up to date.
3. Gates and/or fencing should be in good working condition and locks should be in place and operable. Tank top tamper proof seals/locks intact.
4. An appropriately sized fuel spill kit should be available and complete. It should be placed out of the way, yet easily accessible. Eyewash kit should be full and serviceable.
5. Drain the sumps on the low points of all storage tanks. Displace an adequate amount to ensure a true bottom sample (valve full open). Document findings, sump until Clear & Bright.
6. Energize the fuel pump system in order to apply pressure to the entire fuel system. Quickly inspect system for leaks and stop pump if leaks exist. Check pump light is on.
7. While the fuel system pressurized, sump filters and nozzle. Document first findings, Sump until "Clear and Bright" samples are obtained and test for water. Retain and date samples.
8. Either during recirculation or during product delivery, determine product flow rate and record flow rate.
9. Obtain product flow, once flow rate is determined, read and record the differential pressure. DP should not exceed 15 PSI at rated flow for that vessel.
10. Hoses, swivels and couplings should be checked for leaks while under pressure. Ensure nozzle has dust cap, bonding cable and screen is clean.
11. Reel should be securely bolted down. Cable should be properly wound and clip should be in good working order, unpainted and rust free. Verify bonding is connected.

Attachment 4 – Fuel System Monthly Inspection Checklist

M	Fuel System Monthly Inspection Checklist		
	Location:		
Inspector		**Signature**	**Date**
Additional Remarks:	☐ Check here; use back for comments.		

References: See HSAC RPs 161 and 162. These references should be utilized for designing and maintaining fuel systems.

Non-Conformities: Record each non-conformity with a note number and summarize at the end of the checklist in the Summary of Non-Conformities.

#	Area of Inspection	Remarks	✓ If OK	Reference
1	**GENERAL INFORMATION**			
1.1	**Name of Installation/Vessel/Facility:**		☐	
	Contact Name:	Phone:		
1.2	**In addition to items completed on Daily Inspection for this date, complete the following:**			
1.3	Review last month's Differential Pressure readings for accuracy and address any discrepancies. No results over 15 PSI.	Results:	☐	ATA 103, 3.9. RP 163 Par. Attmnt 2 - 1.6
1.4	Check filter change date when next due, and order replacement if necessary.	Date:	☐	ATA 103, 3.13
1.5	Complete Filter Membrane Evaluation (if the filter vessel is equipped for the test)	Results:	☐	ATA 103, 3.2 RP 163 Par. Attmnt - 1.10
1.6	Remove nozzle and inspect nozzle screen. Check for cleanliness, holes, tears, etc. If any contamination investigate upstream and remedy.	Results:	☐	ATA 103, 2.9.4.4. RP 163 Par. Attmnt 2 - 1.3
1.7	Inspect grounding cable for any damages.	Results: Reading:	☐	ATA 103, 2.9.4.3 RP 163 Par. Attmnt 2 - 3.2

#	Area of Inspection	Remarks	✓ If OK	Reference
	Verify bonding using an ohm meter that the reading is less than 25 ohms or less between the bonding clamp and a known ground with at least 3 turns of the bonding cable rolled out.			
1.8	Hatches, caps, inspect seals for condition.	Results:	☐	RP 163 Par. Attmnt 2 - 4.3
1.9	Verify all signage/decals for Flammable, Jet Fuel, No Smoking, and Product Grade are in place and readable. Piping should have decals with direction of flow indicated.	Results:	☐	ATA103, 2.9.4.6 RP 163 Par. Attmnt 2 -7.1
1.12	Continuity check for 25 Ohms or less, nozzles, tanks	Reading:	☐	ATA 103, 2.9.4.3 RP 163 Par. Attmnt 2 - 1.7
1.13	Floating suction (if equipped) verify floating arm is free and not binding.	Results:	☐	RP 163 Par. Attmnt 2 - 3.6
1.14	Verify proper function of meters and calibration tags/seals in place.	Results:	☐	ATA 103, 2.9.4.7 RP 163 Par. Attmnt 2 - 1.5
1.15	Eyewash Station check for serviceability and if a bottle, verify bottle if still full.	Results:	☐	RP 163 Par. Attmnt 2 - 7.3
1.16	Fire extinguisher, complete/verify monthly inspection is complete and tag updated. Verify frangible tamper seal is intact. Confirm annual inspection tag is still within time limits.	Results:	☐	ATA 103, 2.9.4.8 RP 163 Par. Attmnt 2 - 6.1

Report and Action Discrepancies if any:

#	Discrepancy	Action Taken
1		
2		
3		
4		
5		

Attachment 5 – Fuel System Quarterly Inspection Checklist

Q	Fuel System Quarterly Inspection Checklist		
	Location:		
Inspector		**Signature**	**Date**
Additional Remarks:		☐ Check here; use back for comments.	

References: See HSAC RPs 161 and 162. These references should be utilized for designing and maintaining fuel systems.

Non-Conformities: Record each non-conformity with a note number and summarize at the end of the checklist in the Summary of Non-Conformities.

Note: This checklist is only required if the fuel system has a Reclamation system or filter/separators with automatic water defense float or electronic probe systems.

#	Area of Inspection	Remarks	✓ If OK	Reference
1	**GENERAL INFORMATION**			
1.1	**Name of Installation/Vessel/Facility:**		☐	
	Contact Name:	Phone:		
1.2	**In addition to items completed on Daily/Monthly Inspection for this date, complete the following:**			
1.3	Product reclamation tanks must be visually inspected for cleanliness or pass a microbiological growth test. Clean as required	Results:	☐	ATA 103, 3.1.3.1 RP 163 Par. Attmnt 2 -1.11
1.4	Filter/Separators automatic water defense float or electronic probe systems operational test. **Note:** If a probe is used, and the fuel contains anti-icing additive, the control must be able to detect a water/additive mix.	Results:	☐	ATA 103, 3.12 RP 163 Par. Attmnt 2 - 1.8

Report and Action Discrepancies if any:

#	Discrepancy	Action Taken
1		
2		
3		
4		
5		

Attachment 6 – Fuel System Six-Monthly Inspection Checklist

6M	Fuel System Six-Monthly Inspection Checklist	
	Location:	

Inspector	Signature	Date

Additional Remarks: ☐ Check here; use back for comments.

References: See HSAC RPs 161 and 162. These references should be utilized for designing and maintaining fuel systems.

Non-Conformities: Record each non-conformity with a note number and summarize at the end of the checklist in the Summary of Non-Conformities.

#	Area Of Inspection	Remarks	✓ If OK	Reference
1	**GENERAL INFORMATION**			
1.1	**Name of Installation/Vessel/Facility:**		☐	
	Contact Name:	Phone:		
1.2	**In addition to Items completed on Daily, Monthly and Quarterly Inspections for this date, complete the following:**			
1.3	Verify hose marked to API 1529 Specifications and dated on side of hose	☐ Yes/☐ No Date:	☐	ATA 103, 4.2.7 RP 163 Par. Attmnt 2 - 1.4
	Complete hose hydrostatically test.	☐ Pass/☐ Fail		
	Is hose within time limits for replacement? 5 years if not hydrostatically tested.	☐ Yes/☐ No Date due replacement:		
	10 years if hydrostatically tested every 6 months	Date due replacement:		
1.4	Emergency shut off switch(es) tested for proper operation.	☐ Pass/☐ Fail	☐	ATA 103, 2.7.6.1; RP 163 Par. Attmnt 2 2.2
1.5	Tanks, if steel, inspect interior for any discoloration of delamination of the epoxy lining. Record on ATA Form 103.07 similar	Results:	☐	RP 163 Par. Attmnt 2 - 4.4
1.6	Line strainers inspect and clean after depressurizing system and isolating upstream line strainers and removing cover.	Results:	☐	ATA-103, 2.5.5.7
1.7	Verify age of fuel is less than six months and if older follow the guidelines in Joint Industry Guidance (JIG)	Results:	☐	JIG 1530, RP 163 Par. Attmnt 2 -3.4

1.8	If using bulk tanks for fuel, test for microbes and verify fuel test levels are still within "normal" baseline levels.	Normal Level: Test Level:		☐	RP 163 Par. Attmnt 2 - 5.5.

Report and Action Discrepancies if any:

#	DISCREPANCY	ACTION TAKEN
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Attachment 7 – Fuel System Annual of Initial Inspection Checklist

A	Fuel System Annual or Initial Inspection Checklist		
	Location:		
Inspector		**Signature**	**Date**
Additional Remarks:	☐ Check here; use back for comments.		

References: See HSAC RPs 161 and 162. These references should be utilized for designing and maintaining fuel systems.

Non-Conformities: Record each non-conformity with a note number and summarize at the end of the checklist in the Summary of Non-Conformities.

#	Area Of Inspection	Remarks	✓ If OK	Reference
1	**GENERAL INFORMATION**			
1.1	**Name of Installation/Vessel/facility** Contact Name:	 Phone:	☐	
1.2	**In addition to Items completed on Daily, Monthly, Quarterly and Six Monthly Inspection for this date, complete the following:**			
1.3	**Fuel Procedures Manual** for all actions relating to fueling, training, maintenance, and quality control?	☐ Yes/☐ No Date:	☐	RP 163 Par. Attmnt 2 - 1.1
1.4	Are procedures followed by the fuel staff?	☐ Yes/☐ No	☐	
1.5	Is the previous inspection report available? Discrepancies remedied?	☐ Yes/☐ No Date: ☐ Yes/☐ No	☐	RP 163 Par. Attmnt 2 - 1.2
2	**FUEL TANKS AND PIPING**			
2.1	Constructed of Stainless Steel or interior of epoxy coated carbon steel? Note: Stainless steel tanks and piping with welded connections preferred.	Carbon steel: ☐ Yes/☐ No Epoxy Coated: ☐ Yes/☐ No Stainless steel: ☐ Yes/☐ No	☐	
2.2	Verify all signage/decals for Flammable, Jet Fuel, No Smoking, and Product Grade are in place and readable.	☐ Yes/☐ No	☐	

#	Area Of Inspection	Remarks	✓ If OK	Reference
	Piping should have decals with direction of flow indicated.	☐ Yes/☐ No		
2.3	Perform line strainer inspection, and remove any debris		☐	
3	**Transport Tanks**			**49 CFR 173/180**
3.1	Material: Transit tanks shall be constructed to satisfy Joint Industry Guidance (JIGs).	Carbon steel: ☐ Stainless steel: ☐	☐	
3.2	The tank's serial number shall be permanently marked on the data plate.	Serial Numbers:	☐	
3.3	Dept. of Transportation Inspections:	Dates recorded on tank data plate? ☐ Yes/☐ No	☐	49 CFR, 180 (G)
	Transport Tank Intermediate Inspection?	Date:		2½ years
	Transport Tank Recertified?	Date:		5 years
3.4	Do tank openings have frangible witness seals to verify contents are untampered?	☐ Yes/☐ No	☐	
3.5	Is there a method of pressure relief?	☐ Yes/☐ No	☐	49 CFR
	Is it inspected and calibrated?	Date:	☐	
3.6	Labeling - proper for Jet Fuel?	☐ Yes/☐ No	☐	
3.7	(Multiple tanks) Are tanks used in order of receipt, is there a control system?	☐ Yes/☐ No	☐	Best Practice
3.8	The tank shall be encased in a robust steel cage (transit frame) with tie-down points and four main lifting eyes.	☐ Yes/☐ No	☐	
3.9	The tank frame shall incorporate cross-members to provide an integral "ladder" access to the tank top.	☐ Yes/☐ No	☐	
4	**Fixed Storage Tanks**			**ATA 103, 2-11**
4.1	Inspection Dates	Carbon steel:	☐	Annual
		Stainless steel:	☐	Two Years
4.2	Are seals on inspection hatches and caps in good condition?	☐ Yes/☐ No	☐	
4.3	Labeling - proper for Jet Fuel?	☐ Yes/☐ No	☐	
4.4	Are tanks sloped 1:30 towards the sump drain?	☐ Yes/☐ No	☐	
4.5	Floating suction (if equipped) verify floating arm is free and not binding.	☐ Yes/☐ No	☐	

#	Area Of Inspection	Remarks	✓ If OK	Reference
4.6	Is the tank bottom filled, or does it have a down pipe to stop free fall of the fuel?	☐ Yes/☐ No	☐	
4.7	Is clearance under drains sufficient to permit direct drain samples?	☐ Yes/☐ No	☐	
4.8	Do tank openings have frangible witness seals to verify contents are untampered?	☐ Yes/☐ No	☐	
4.9	Are tanks labeled with fuel type?	☐ Yes/☐ No	☐	
4.10	Are pipelines labeled with fuel type?	☐ Yes/☐ No	☐	
4.11	Bonding: Is tank bonded to ground and continuity checked and recorded?	☐ Yes/☐ No	☐	ATA 103, 1-8 D
4.12	What method of verifying fuel quantity is available? (Fiberglass rod or tube preferred).	☐ Fiberglass Rod ☐ Tube ☐ Other:	☐	
4.13	Is there a method of pressure relief?	☐ Yes/☐ No	☐	ATA 103
	Is it inspected and calibrated?	Date:	☐	
4.14	Are inlet and outlet valves labeled with fuel type? (Not required all regions)	☐ Yes/☐ No	☐	
5	**PUMPS**			
5.1	Amber pump running warning light installed?	☐ Yes/☐ No Color:	☐	Industry Practice
5.2	Is a non-reversing valve fitted downstream of pump?	☐ Yes/☐ No	☐	
5.3	Are stop/start buttons adjacent to equipment and within the sight of the refueler and accessible?	☐ Yes/☐ No	☐	ATA 103
	Is it tested periodically?	☐ Yes/☐ No	☐	
5.4	Is a deadman switch configuration installed?	☐ Yes/☐ No	☐	
	Is it tested periodically?	☐ Yes/☐ No	☐	
5.5	Is a pressure gauge fitted to outlet of the pump, is it calibrated and results recorded?	Date:	☐	ATA 103, 1-8 F (2)
6	**FILTERS**			
6.1	Are filter/separator and/or filter/monitor units installed?	☐ Yes/☐ No	☐	AA 103, 1-8 F

#	Area Of Inspection	Remarks	✓ If OK	Reference
6.2	Are records of filter changes on QC records?	☐ Yes/☐ No	☐	ATA 103, 2-13
6.3	Are filter canisters marked with last date of filter change?	☐ Yes/☐ No Date:	☐	ATA 103, 2-13
6.4	Are the filters water blocking (mandatory)?	☐ Yes/☐ No	☐	ATA 103, 1-7 B API/IP 1851/1583
6.5	Are the filters/separator units drained daily, inspected, tested for water, samples retained, and results?	☐ Yes/☐ No	☐	ATA 103
	Recorded in QC records?	☐ Yes/☐ No		
6.6	Do the filters have automatic air eliminators?	☐ Yes/☐ No	☐	API 1581 ATA 103
7	**FUEL DISPENSING UNIT**			
7.1	Differential Pressure Readings recorded (15 psi Maximum)? A reading of zero indicates filter is in bypass and should be replaced.	Recorded in Log? ☐ Yes/☐ No	☒	
7.2	Are filter pressure differential checks completed daily or when the refueling equipment is being used for that day and then recorded?	☐ Yes/☐ No	☐	
7.3	Differential Pressure readings are verified for accuracy and any discrepancies resolved.	☐ Yes/☐ No	☐	
7.4	Are the gauges calibrated?	☐ Yes/☐ No Date:	☐	ATA 103, 1-8 (F2)
7.5	Meter: Is the delivery meter calibrated/controlled/functioning properly and are results recorded?	☐ Yes/☐ No Date:	☐	ATA 103, 1-8 (F3)
	Tags and seals in place?	☐ Yes/☐ No		
7.6	Pressure Gauge: Is a pressure gauge fitted at dispensing cabinet?	☐ Yes/☐ No	☐	ATA 103, 1-7 L
	Is it calibrated?	☐ Yes/☐ No Date:	☐	
7.7	Cabinet: Is dispensing equipment exposed or fitted into a cabinet?	☐ Exposed/☐ In Cabinet	☐	
7.8	System located below helideck landing level?	☐ Yes/☐ No	☐	

#	Area Of Inspection	Remarks	✓ If OK	Reference
7.9	Grounding Cable: Is there a retractable bonding cable fitted and being used?	☐ Yes/☐ No	☐	
	Verify bonding using a ohm meter that the reading is less than 25 ohms between the bonding clamp and a known ground with at least 3 turns of the bonding cable rolled out	Reading less than 25 ohms? ☐ Yes/☐ No	☐	
	Is it serviceable and is continuity checked and recorded?	Continuity less than 0.5 ohm ☐ Yes/☐ No	☐	
8	**Hoses**			
8.1	Verify all Six-Monthly checks have been completed.	Date: Replacement Due Date:	☐	Att 6 - 1.3
9	**Fuel Nozzle**			
9.1	Verify nozzle cap and chain are present and that fuel nozzles capped when not in use?	☐ Yes/☐ No	☐	ATA 103, 1-8 D
9.2	Nozzle Screens check for cleanliness, holes, tears, etc. If any contamination investigate upstream and remedy.	☐ Yes/☐ No	☐	
9.3	If gravity refueling, does the nozzle have a cone filter fitted, and is it inspected for cleanliness?	☐ Yes/☐ No	☐	ATA 103, 1-8
9.4	Do nozzles have grounding cables, continuity checked, and recorded?	☐ Yes/☐ No	☐	ATA 103, 1-8
10	**SAMPLING**			
10.1	Are samples taken from fuel nozzle, filter and tank sump prior to the first refueling of the day, inspected, tested for water, and samples retained/results recorded? Tanks, filters, etc. should have any water in sumps drained off if any is shown in the water tests, visual or capsule.	☐ Yes/☐ No	☐	ATA 103, 1-8A (2)
10.2	Are sufficient 1 quart wide necked sample jars available?	☐ Yes/☐ No	☐	ATA 103, C (2)
11	**FIRE FIGHTING (NFPA 407)**			
11.1	Is firefighting equipment available? Fire Extinguisher Type (BC), with minimal size of 30 pounds required.	☐ Yes/☐ No	☐	NPFA 407

#	Area Of Inspection	Remarks	✓ If OK	Reference
11.2	Are fire extinguishers inspected monthly and tagged?	☐ Yes/☐ No	☐	ATA 103, 1-8 D Annual
	Verify frangible tamper seal is intact.	☐ Yes/☐ No		
	Confirm annual inspection tag is still within time limits.	☐ Yes/☐ No Next Due:		
11.3	Are fueling personnel trained on equipment use?	☐ Yes/☐ No Last Date:	☐	
11.4	Are fire drills conducted periodically and recorded (manned structures only)?	☐ Yes/☐ No Last Date:	☐	NFPA 407
11.5	Are water detection capsules used and within the expiry life date?	☐ Yes/☐ No Expiry Date:	☐	
12	**QUALITY CONTROL & RECORDS**			
12.1	Are quality control checks made in accordance with the previous recommendations for all equipment, fuel sampling, maintenance programs, etc. and documentation of those checks retained?	☐ Yes/☐ No	☒	
12.2	Are written logs /checklists available to indicate all the required checks are being performed? See previous references for frequencies.	Daily: ☐ Yes/☐ No Monthly: ☐ Yes/☐ No Annual: ☐ Yes/☐ No	☐	
12.3	Are calibration records available for all the previously noted calibration requirements for all meters, gauges, and pressure relief valves?	☐ Yes/☐ No	☐	
12.4	Are Fuel Settling Requirements Observed (one hour/foot of fuel depth)?	☐ Yes/☐ No	☐	
	Is fuel tested before loading into bulk/transport tanks?	☐ Yes/☐ No	☐	
12.5	Is a record maintained?	☐ Yes/☐ No	☐	
12.6	Is there a QA program for transport tanks to verify they are sealed on receipt?	☐ Yes/☐ No	☐	
12.7	Quality records allow tracking back to source of the fuel?	☐ Yes/☐ No	☐	

#	Area Of Inspection	Remarks	✓ If OK	Reference
12.8	Filter membrane evaluation (Millipore) (if required) being completed?	☐ Yes/☐ No	☐	
12.9	Fuel Microbe Testing in Bulk Storage Tanks: Fuel should be tested initially for a "normal baseline level" initially and then retested as still within those "normal" baseline levels. Six month testing preferred, especially where sumping is infrequent such as with transit tanks or fuel usage is slow.	☐ Yes/☐ No Test Level Recording:	☐	RP 163 Par. Attmnt 2 - 5.5
13	**TRAINING**			
131	Is there a fuel training & qualification program and are training records available for personnel maintaining the system and conducting refueling?	☐ Yes/☐ No	☐	ATA-103, 2.1.9 NFPA 407-17, 4.2.2
13.2	Is competence checked six-monthly?	☐ Yes/☐ No Frequency:	☐	
14	**SAFETY**			
14.1	Are signs available for: No Smoking, Flammable, etc.?	☐ Yes/☐ No	☐	ATA 103, 1-8D 5
14.2	Are appropriate Safety Data Sheets (Hazardous Material) available?	☐ Yes/☐ No	☐	Best Practice
14.3	Is an eyewash station available? Eyewash Station check for serviceability and if a bottle, verify bottle if still full.	☐ Yes/☐ No	☐	Best Practice
14.4	Are spill cleanup/containment supplies available?	☐ Yes/☐ No	☐	Best Practice
14.5	Are goggles and gloves worn during refueling operations	☐ Yes/☐ No	☐	Best Practice

Report and Action Discrepancies if any:		
#	**DISCREPANCY**	**ACTION TAKEN**
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Attachment 8 – Fuel Transport Tank Checklist

Fuel Transport Tank Checklist										
Location:										
Month:		**Day:**								
		Tank Serial #:								
		Seal #:								
Before Fuel Transfer										**Required Items/Actions**
1	**Position Operable Fire Fighting Equipment**									Appropriate size and type fire extinguishers easily accessible and properly charged
2	**Locate and Be Aware of Emergency Fuel Shut Off**									Locate and be familiar with the operation of all Emergency Fuel Shut-Off Controls
3	**Bond Transport Tank**									Once properly positioned and level, connect bonding cable and allow any static charge to equalize (up to 3 mins)
4	**Visually Inspect Transport Tank Exterior**									Inspect the entire exterior of Tank for damage; ensure all placards are correctly attached and legible; note any abnormalities
4a	**Confirm Transport Tank Seals**									Inspect and ensure Filler Cap on top of Tank and Discharge Cap are sealed
		NOTE: If seals are broken or missing, **DO NOT USE** - Return Transport Tank for onshore inspection								
5	**Perform White Bonded Bucket Evaluation**									After allowing for settling time, a White Bonded Bucket Evaluation should be performed to visually detect any discoloration, or contamination
6	**Perform Clear and Bright Test**									Aviation fuel products should be without particulate, or water contamination; the fuel should sparkle in a clear glass jar
7	**Determine contents of tank**									Determine and Record the volume of fuel product in selected receiving tank
8	**Verify contents of Transport Tank will fit in tank**									Confirm available space in fuel tank to have Transport Tank transferred into ensuring adequate space for the entire transfer.

	Fuel Transfer Procedure		Ensure that required equipment is in place to safely and properly transfer the Transport Tank fuel
9	**Inspect Transfer Hose**		Remove caps from transfer hose and inspect for contamination, gasket and connection condition
9a	**Connect Transfer hose to pumping system**		Connect the inspected transfer hose to proper inlet piping connecting
10	**Vent Transport Tank**		Ensure cap on top of Transport Tank is off, allowing tank to adequately vent during transfer
11	**Open Valve on Transport Tank**		Open the discharge valve at the bottom of the Transport Tank remembering that the orientation of the valve may be opposite from standard application
12	**Begin fuel transfer**		Begin transfer by activating pump, immediately check for leaks.
		REMEMBER: Fuel should be filtered when transferring from Transport Tank into Storage Tank	

	Fuel Transfer Procedure - Continued		Required Items/Actions
12a	**Operate Deadman Control (if applicable)**		Engage Deadman Control, confirm filling process is leak-free and Monitor entire transfer to avoid overfilling
12b	**Sump Receiving Filter Vessel Under Pressure**		Drain receiving filter sumps under pressure while product is being received and record results
12c	**Read and Record Differential Pressure**		Read the Differential Pressure (DP) on the inbound filter during offloading, correct for flow, and check DP
13	**Complete Transfer Operation**		Once High Level Shut-Off has been activated, or other means of ensuring Transport Tank is completely, disengage Deadman
13a	**Disconnect Filling Hose**		Disconnect Filling Hose, ensuring not to spill any fuel and re-install Dust Caps on all connections
13b	**Disconnect Bonding Cable**		After all hoses have been disconnected, remove and stow Bonding Cable

Sealing Transport Tank									NOTE: After transfer process is complete, Tank must be re-sealed and readied for shipment
14	**Close and Seal the Tank - Note Seal #**								Properly close and adequately tighten all openings/connections and seal all openings
15	**Tag Condition and Date**								Attach Tank fill level condition (Full), and date of filling
16	**Finalize and Sign Paperwork**								Complete Transport Tank Checklist, Bill of Lading and any other required documentation in for shipment

Notes:

Attachment 9 – Aircraft Refueling Checklist

Aircraft Refueling Checklist									
Location:									
Month:		**Date:**							
		Time:							
		A/C#:							
	Preparation for Fueling								**Required Items/Actions**
1	**Perform Quality Assurance of Fuel**								Prior to any aircraft fueling, perform all Quality Assurance tasks (see Daily Fuel System Checklist at Appendix 2, Attachment 3) on fuel and fuel system
2	**Proper Training/Qualified Personnel**								All personnel involved in any aircraft fueling should be properly trained and qualified to perform the fueling task
3	**Personal Protective Equipment (PPE)**								All personnel involved in any aircraft fueling shall wear the appropriate PPE (i.e. Eye, Ear, Hand and Foot protection)
4	**HOT (Engines Running) Fueling**								**Defined as**: Refueling while main turbine engine(s) is (are) running and main rotor and tail rotor is turning
5	**Reduced Rotor RPM**								**DO NOT APPROACH** the helicopter until the pilot has reduced the engine speed, rotors have slowed to idle speed and pilot has signaled approach is OK
6	**Eye Contact**								Maintain eye contact with the pilot to ensure clear communication is maintained
7	**Confirm Fuel Load**								Ensure the required volume of fuel is communicated, a pilot "Tapping" the top of their head indicates a full Top Off
	Before Fueling								**Required Items/Actions**
8	**Position Operable Fire Fighting Equipment**								Appropriate size and type fire extinguishers should be easily accessible and properly charged

9	**Locate and Be Aware of Emergency Fuel Shut Off**								Locate and be familiar with the operation of all Emergency Fuel Shut-Off Controls
10	**Turn Fueling Pump ON**								Engage fueling pump pressurizing refueling system
11	**Open Fueling Valve**								Open Fueling Valve at Fueling Cabinet to supply pressurized fuel to fueling hose
12	**Bond to Aircraft**								Connect Bonding Cable to designated location on aircraft
13	**Bond Nozzle**								Connect Bonding cable between Fueling Nozzle and designated Bonding location on the aircraft
14	**Open Aircraft Fuel Cap**								After Fueling Nozzle is Bonded, open the Aircraft's Fuel Tank Cap.
15	**Close windows/doors on fueling side of the aircraft**								**NOTE:** If there is no system for Nozzle Bonding, touch the Fueling Nozzle to the closed cap to discharge any static charge
Fueling the Aircraft									**Required Items/Actions**
16	**Begin Fueling**								Begin fueling operation by pulling nozzle trigger and maintaining metal-to-metal contact between nozzle and aircraft
17	**Monitor Pilot**								Maintain eye contact with the pilot during entire fueling operation
18	**Ensure Aircraft is filled to the desired level**								Ensure Aircraft is filled to the desired level
After Fueling									**Required Items/Actions**
19	**Remove Fueling Nozzle**								Release nozzle trigger, Safely remove nozzle from fueling port ensuring not to spill any fuel and install dust cap
20	**Replace Aircraft Fuel Cap**								Carefully secure aircraft Fueling Cap
21	**Remove Bonding Cable from Fueling Nozzle**								Disconnect Bonding Clip or Plug between Nozzle and Aircraft

22	**Return Nozzle and hose**								Return and stow Fueling Nozzle and remove hose from Helipad/Helideck
23	**Return Bonding Cable**								Return and secure Bonding Cable removing it completely from Helipad/Helideck
24	**Close Fueling Valve**								Close Fueling Valve to stop pressure to Fueling Nozzle
25	**Turn OFF Fueling Pump**								Turn OFF Fueling Pump to depressurize fueling system

Notes:

APPENDIX 5 – FIRE FIGHTING SYSTEM MAINTENANCE REQUIREMENTS

Note: the maintenance items are recorded in Helideck Inspection Checklists

FIRE FIGHTING SYSTEM MAINTENANCE REQUIREMENTS			
#	**Area of Maintenance**	**Preventive/Corrective Actions**	**Frequency**
1	**Firefighting System**		
1.1	**General Condition of Equipment**	If any obvious discrepancies are found that could affect operation; repair Test full function of the system to ensure it meets specifications and covers the entire helideck surface, and remedy any discrepancies	Daily Annual
1.2	**Evaluation of foam concentrates (Primary and Back-up Supply) and finished foam**	A test of the finished foam shall be completed for foam produced at the nozzle and stocks to verify foam is still within specification as required in the original design, replace foam and retest. Certificates provided for finished foam and concentrates. **Note:** Mixing of different concentrates in the same tank, i.e. different either in make or strength is unacceptable. Any decision regarding selection of foam concentrates should take account of the design characteristics of the foam system.	Annual
1.3	**Foam tank and container labeling**	Verify that the foam storage tanks/containers are labeled matching the system requirements. If they do not match, contents should be evaluated and replaced if necessary or labels changed to match contents.	As Needed
1.4	**Foam Induction Equipment**	Verify that settings of adjustable inductors, if installed, should correspond with the strength of concentrate in use. If they do not match, adjust the setting as necessary or replace the foam in the required concentrate.	Monthly
1.4	**Foam Monitors (if installed)**	Verify the monitors can be rotated manually, if not repair. Automated systems should be tested annually per item 1.1 above, and if any discrepancies, repair.	Monthly Annual
1.5	**Foam Hand Branches and Foam System Hoses**	Verify they are serviceable, not cracked, If not, replace.	Monthly
1.6	**Foam Stocks**	Verify foam stocks match the required percentage and quantities and replace, add as necessary. If kept in the original unopened and airtight manufacturer supplied container and stored within the temperature range of 35ºF - 120ºF (2ºC - 49ºC) a multi-year shelf life can be expected (as recommended by the manufacturer). When stored in other than the manufacturer's supplied container, please check with manufacturer for storage limitation guidelines	Annual As Specified by Manu-facturer

FIRE FIGHTING SYSTEM MAINTENANCE REQUIREMENTS			
#	**Area of Maintenance**	**Preventive/Corrective Actions**	**Frequency**
1.7	**Hydrant Points**	Verify serviceability, and repair as necessary	Daily
1.8	**Complimentary Agents**	Verify that the complementary agents are be sited so that they are readily available at all times, if not; relocate. Verify that the quantity stocks of complementary agents are adequate to allow for replenishment as a result of activation of the system during an incident or following training or testing, should be held. If not, replenish. Complementary agents should be subject to annual visual inspection and pressure testing in accordance with manufacturers' recommendations. If any discrepancies; replace.	Daily Monthly Annual
1.9	**Portable Fire Extinguishers (Dry Powder)**	Verify that dry chemical powder is 'foam compatible' and replace if not. Verify visually that the pressure gauge is within limits (if installed), or that the system frangible seals or still intact. Update the tag once the visual inspection is complete. Complete an annual pressure test, and if out of compliance; replace.	As needed Monthly Annual
2	**Personnel Equipment**		
2.1	**Bunker Coats. Trousers, Boots, Gloves**	Flame resistant garments should be removed immediately and replaced with clean FR apparel if they become soiled with flammable materials. Clean following manufacturer recommendations if soiled. Repair & Mending: Minor repairs that do not affect the integrity of the garment may be made with like materials by either heat sealing or sewing on patches or darning small holes. Replace if faded or worn beyond repair	As Needed As Needed As Needed As Needed
2.2	**Self-Contained Breathing Equipment (SCBE) 2 sets with spare cylinders stored in a weatherproof green cabinet near the fire station/helideck and marked "Breathing Apparatus"**	SCBE checked for serviceability, with clear uncrazed lens, and fully charged cylinders. If any discrepancies; repair/replace.	Daily
2.3	**Fire Helmets with Full Face Visors**	If face shields are damaged or crazed: replace	As Needed

APPENDIX 6 – SAMPLE WEIGHT SCALES SELF-CALIBRATION RECORD

Pax/Baggage/Cargo Scales Self-Calibration Log									YEAR
MONTH	**DAY**	**KNOWN WEIGHT (Pounds)**	**DEVIATION (+/- Pounds)**	**2nd WEIGHT (if required)**	**DEVIATION (+/- Pounds)**	**3rd WEIGHT (if required)**	**DEVIATION (+/- Pounds)**	**NAME**	**SIGNATURE**
Jan									
Feb									
Mar									
Apr									
May									
Jun									
Jul									
Aug									
Sep									
Oct									
Nov									
Dec									

APPENDIX 7 – AUTOMATED WEATHER OBSERVATION SYSTEM (AWOS) MONTHLY MAINTENANCE PROGRAM

Automated Weather Observation System (AWOS) Monthly Maintenance Program			
Date Completed:		**Completed by:**	
Location:		**AWOS Radio Frequency:**	
		AWOS Telephone Number:	

Notes:

1. Change frequency to every 1-2 weeks in very dusty/extreme/offshore conditions or if system reliability appears to be lacking.
2. This list was originally developed for use on "All Weather/SMI" systems, and if used on other types, list of contents/equipment and instructions should be verified by the particular manufacturer.
3. Additional maintenance would include annual calibration and servicing by the vendor.
4. This checklist or equivalent shall also be used for non-automated weather system equipment maintenance

#	DESCRIPTION	ACTIONS TAKEN/REMARKS
1	**Technician Qualifications:** The AWOS repair technician should have electronics/instrument background or experience.	
2	**Tools and Supplies Required:**	
2.1	Assorted hand tools	
2.2	Clean, Lint Free, dry cloth	
2.3	Cleaning fluids: Use distilled water or mild soap solution with thorough rinsing to avoid streaks. IMPORTANT: Do not use any cleaning product containing ammonia; this may damage the optical coating.	
2.4	Lightweight, greaseless oil (ex: 3-in-1)	
2.5	An electronic grade silicone sealant for areas where wires go into cabinets or any other area which might be open to the environment	
2.6	Touch-up paint. Any good enamel is acceptable.	
2.7	AWOS System Maintenance Manual	
3	**General:**	
3.1	Check AWOS computer display screen for any "missing" parameters and obvious failures.	
3.2	Any light corrosion found on exterior surfaces: use a wire brush or emery cloth on corroded areas. Naval jelly or equivalent can also be used on Aluminum surfaces.	

#	DESCRIPTION	ACTIONS TAKEN/REMARKS
3.3	Data transfer should be verified. Is the weather data being relayed via the intranet or other communications means to the necessary receiving stations?	
	Note: Compressed air should not be used to clean any of the system, especially the Pressure Sensing unit.	
4	**Sensors Mounting Location**	
4.1	Check all cables for security and condition.	
4.2	Clean Day/Night sensor lens with soft cloth.	
4.3	Inspect for any corrosion and clean corrosion where necessary.	
5	**Wind Sensors:** (if not ultrasonic which are non-moving and only requires cleaning with a soft cloth)	
5.1	Visually verify that the wind vane and wind speed sensors are moving freely) and are securely mounted.	
5.2	Check to see that wind vane orientation is acceptable compared to the indicated direction on the display readings.	
5.3	Check the bearings in the wind speed sensor for freedom of movement. If any binding or restrictions; replace.	
6	**Temperature/Relative Humidity Sensor(s):**	
6.1	Check the sensors are free from debris, cobwebs, hornets' nest, etc. and is secure. If dust or debris is found; clean the dust filter.	
6.2	Check for fan running (if installed). Noisy fan can indicate a sign of worn bearings. Fan housing is typically composite, but if not, touch up with paint as necessary.	
6.3	Check all cables for security.	
7	**Pressure Sensor:** Visually check pressure sensor port and clean any debris from within the plate area.	
8	**Tipping Bucket Rain Gauge**	
8.1	Inspect the sensor for mechanical security.	
8.2	Remove the screen from the funnel of the gauge and gently tap the screen to free any dirt or debris. Replace screen if damaged or clogged.	
8.3	Check rain gauge for corrosion. Clean any corrosion found and use touch-up paint where required	
9	**Visibility Sensor:** There may be up to four (4) small lenses, each one pointing 'in' for the visibility sensor.	
9.1	Inspect the sensor for mechanical security.	
9.2	Inspect all cables for security.	
9.3	Remove any spider webs or other debris, which may block the optical path.	

#	DESCRIPTION	ACTIONS TAKEN/REMARKS
9.4	Clean the sensor windows using a soft cloth and distilled water or mild soap solution with thorough rinsing to avoid streaks.	
9.5	Inspect sensor and mounting for corrosion. Clean any corrosion found and use touch-up paint as required.	
10	**Ceilometer:** There may be up to two lenses on the top of the ceilometer.	
10.1	Inspect the sensor for mechanical security.	
10.2	Inspect all cables for security.	
10.3	Clean the outside surface sensor "window" using a soft cloth and distilled water or mild soap solution with thorough rinsing to avoid streaks. **DO NOT LOOK DIRECTLY INTO THE LENS.**	
10.4	Check the desiccant cartridge. If the cartridge is BLUE, the cartridge is in working order. Replace the cartridge if the color is pink.	
10.5	Check the two filters (one coarse & one fine) mounted on the underside of the blower unit. Make sure they are free from dirt and debris.	
10.6	Inspect sensor for corrosion. Clean any corrosion found and use touch-up paint as required.	
11	**Present Weather Sensor (optional sensor):**	
11.1	Inspect the sensor for mechanical security.	
11.2	Inspect all cables for security.	
11.3	Check lens heaters by using a clean finger and touching the lens in front of the disc shaped heaters. Surface should be slightly warmer than ambient temperature.	
11.4	Clean the sensor windows using a soft cloth and lens cleaning solution s previously described.	
11.5	Inspect sensor and mounting for corrosion. Clean any corrosion found, and use touch-up paint as required	
12	**Check AWOS "voice":** Listen to telephone and VHF radio message (if equipped) through use of a VHF radio (or crew verification) and call to the AWOS phone number.	

NOTES:

#	DESCRIPTION	ACTIONS TAKEN/REMARKS
DISCREPANCIES		**ACTIONS TAKEN/REMARKS**
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

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SAFETY THROUGH COOPERATION
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