FLIGHT SAFETY FOUNDATION

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Basic Aviation Risk Standard

Offshore Helicopter Operations Safety Performance Requirements





Version 3, December 2016

Contents

Purpose

This document is first and foremost a framework that sets safety performance goals necessary to assure safe offshore helicopter operations.

The framework is populated with the requirements and standards that when implemented and effective will achieve these goals.

All users of this document are encouraged to test and challenge each performance requirement and where warranted identify areas for continuous improvement to be shared throughout industry.

The risk-based use of this framework is further intended to encourage alternative means of compliance when supported by robust risk assessment that show the safety outcomes can be met using alternative controls.

The use of the Implementation Guidelines that accompany the Safety Performance Requirements will collate any accepted alternative means of compliance and ultimately provide examples of best practice in achieving the safety goals.

The document will be on a two year revision schedule and will incorporate industry review and feedback during each version update.

All national and international regulations pertaining to offshore safety performance requirements must be followed when identified as being more stringent than those controls identified in this document.

Document Structure and Use

This Standard is presented in a concise, risk-based format to emphasize the relationship between major threats to offshore safety performance requirements, their associated controls and applicable recovery/mitigation measures presented in Figure 1.

The format is intended to assist all company personnel engaged in coordinating offshore helicopter activities to better understand and manage the aviation risk to their operation.

Controls that have wide applicability to multiple threats are shown as 'common enablers' and controls that relate to a few threats are listed against one primary threat, for ease of presentation. Similarly routinely conducted activities intended to mitigate an accident (such as passenger briefing) are on the left hand side and some routine activities (such as insurance, flight following and HUET training) are on the right hand side of the bow tie.

Companies and air operators are expected to evaluate the effectiveness of the implemented controls, identify any interdependence between controls (where for example a failure of one control reduces the effectiveness of another) and continuously improve control effectiveness as part of their Safety Management System.

Aircraft Operator Review

This Standard is designed to be used as a primary reference for the review and approval of aircraft operators. Aircraft operators will be audited to the BARS Question Master List with an audit protocol mapped to this Standard.

Variations

Any variation to this Standard is at the discretion of each company in consultation with the aircraft operator.
Each variation request must be assessed to demonstrate that the risks associated with the variation are tolerable and justify safe continuation of operations. Where requirements apply to 'long-term contracts', if they are not practical to introduce for the start of the contract, it is expected that an assessment is made of when they can be introduced during the life of a proposed contract.

A diagram showing the Basic Aviation Risk Standard Variance Process is presented in Figure 2.

Key Definitions

Aircraft Operator

The approved organization providing a service with aircraft (and includes reference to approved training/maintenance/ continuing airworthiness management organizations etc. that are either part of the aircraft operator or contracted by the aircraft operator).

Company

The individual entity using this Standard in support of contracted aviation operations.

Competent Aviation Specialist

A company designated aviation advisor or Flight Safety Foundation BARS Accredited Auditor.

High Traffic Risk Environment

An area where the potential for conflicting traffic is assessed as being high. This may include:

- Areas where there are many destinations in the same basin offshore;
- Multiple aircraft operators using similar routes;
- Operations near military exercise areas or other sources of regular adjacent traffic;
- Onshore operations from busy airfields with a mix of helicopter and fixed wing traffic; or
- Multiple adjacent onshore heliports.

Hostile environment

An environment in which a successful emergency landing cannot be assured; or the occupants of the aircraft cannot be adequately protected from the elements until recovered; or search and rescue response/capability cannot be provided consistent with the anticipated exposure (irrespective of whether the area is designated as hostile by the responsible regulatory authority).

All environments should be assumed to be hostile unless demonstrated to be non-hostile for the specific operation being conducted.

Non-hostile environment

An environment (unless designated as hostile by the responsible regulatory authority) in which a successful emergency landing can be reasonably assured and it can be assured that the occupants can be adequately protected from the elements until recovered.

All environments should be assumed to be hostile unless demonstrated to be non-hostile for the specific operation being conducted. Some environments which may be non-hostile for most of the year may become hostile in locally extreme weather. Considerations should be given to:

- Occupant survival time in the localized water conditions;
- Search and rescue resources available;
- Total call-out and recovery time; and
- Cumulative time taken for individual recovery operations.

Long-term contract

Any contract using aircraft assigned solely to the company for a planned duration of greater than six months. Certain additional requirements apply to long-term contracts.
Where practical these should be considered for all contracts.

Performance Class 1

The helicopter is able to land within the rejected takeoff distance available or safely continue the flight to an appropriate landing area, depending on when the failure occurs.

Performance Class 2

Performance is available to enable the helicopter to safely continue the flight, except when the failure occurs early during the takeoff or late in the landing, in which cases a forced landing may be required.

Performance Class 3

At any time during the flight, a forced landing may be required in a multi-engine helicopter but will be required in a single-engine helicopter.

Policy, Procedures and Processes

Where these terms are used they require the documentation of the associated policy, procedure or process in a controlled, accessible and comprehensible manner, as shall the Safety Management System and other manuals.

Vessels

Vessels include Floating Production Storage Offload (FPSO) vessels, Mobile Drilling Unit (MODU) except when jacked-up, Diving Support Vessels (DSV), derrick barges, seismic vessels and other ships.

Additional definitions or abbreviations related to the use of this Standard are listed in Appendix 3.

Figure 1: BARS Bow Tie Risk Model – Schematic of Offshore Safety Performance Requirements.

Accident Threats	Accident Prevention Goals (Controls)							Accident Survival Goals (Defences)
System Failure	Early Diagnosis of Potential Failures	Safety Equipment Operating	Enhanced Reliability	Airworthiness Management	Effective Maintenance/ Tool Control	Error Tolerant Designs	Supply Chain	Impact Survival
Aircraft Upset	Flightpath Management	Effective Use of Automation	Enhanced Situational Awareness					Flotation
Surface/Obstacle Contact	Enhanced Spaces/ Reduce Obstacles	Detect/Avoid Obstacles	Night/IFR Flight Management	RADALT Procedures/Use				Underwater Escape
Heliport/ Helideck	Vessel Pitch, Roll and Heave Limits	Heliport Management	Multiple Helicopters Operations	Heliport/Helideck Design				Sea Survival
Weather	Effective Flight Planning	Regular Reports/ Forecasts	Adverse Weather Policy/Use	Aircraft Design	Weather Radar			Land/General Survival
Collision in the Air	Altitude Management	ATC Oversight	Bird Strike Prevention	Airborne Collision Avoidance System	High Intensity Strobe Lights (HISL)			Alerting
Ground Collision/ Handling	Weight, Balance and Loading	Passenger Briefing	Flight Handling	Dangerous Goods	Security and Check-In Control			SAR/Emergency Response
Fuel	(Hot) Refueling Procedures	Fuel Checks	Fuel Planning	Fuel Reserves	Fuel Storage, Testing and Inspection			Post-Accident
Common Enablers	Safety Leadership/Culture	Effective Safety Management System	Information Sharing	Competency	Multi-crew Operations	Personnel Readiness	Modern/Proven Technology	Standards and Oversight

Aircraft Accident

Safety Performance Requirements

FLIGHT SAFETY FOUNDATION

BARS® BASIC AVIATION RISK STANDARD

HeliOffshore Safety Through Collaboration

1.0: Common Enablers

Common enablers that apply to all accidents threats outlined in this Standard

Common Enabler 1.1: Safety Leadership and Culture

Ensuring an organizational culture where the normal behavior at all levels is risk conscious, safe, learning and collaborative behavior.

All organizations must demonstrate an active commitment to safety. They must actively encourage and promote a positive safety culture within their organization through development of safety leadership skills, behaviors and authentic engagement of their entire workforce. They must regularly evaluate their culture as part of their Safety Management System (SMS) using safety culture surveys or analysis of other indicators.

Common Enabler 1.2: Effective Safety Management System

Ensuring Safety Management Systems are effective at gathering and analyzing safety information, managing risk, providing assurance and ensuring continuous improvement.

SAFETY MANAGEMENT SYSTEM

All organizations must have a Safety Management System (SMS) that is integral to the management activity of their organization.

The SMS must identify occurrences, actual and potential safety hazards, assess the associated risks and include consideration of human performance, safety culture and threat and error management. The SMS must enable effective workforce participation and appropriately cover activities conducted by safety critical sub-contractors. Extensive guidance exists on the design of an SMS (see the Implementation Guide).

The organization must conduct a risk assessment before commencing operations for any new or changed aviation activity and implement any identified mitigating controls. There must be a defined process to periodically review the assessments for continuing activities.

The SMS must be subject to continuous improvement. The organization must have safety objectives that are reviewed at least annually and regularly monitor appropriate Safety Performance Indicators.

FLIGHT DATA MONITORING

For long-term contracts the aircraft operator must have a Flight Data Monitoring (FDM)program as part of its SMS to systematically analyze and make pro-active use of digital flight data from routine operations to reduce risk and provide operational feedback.

LINE OPERATIONS SAFETY AUDIT

For long-term contracts the aircraft operator must have a structured Line Operations Safety Audit (LOSA) program as part of its SMS to supplement FDM with cockpit observations. The LOSA data must be analyzed and appropriate action plans implemented.

MAINTENANCE OBSERVATION PROGRAM

For long-term contracts the aircraft operator must have a structured Maintenance Observation Program (MOP) to monitor maintenance practices through observation of maintenance activity. The MOP data must be analyzed and appropriate action plans implemented.

Common Enabler 1.3: Information Sharing

Ensuring a collaborative approach to sharing safety information to directly benefit the entire industry and all stakeholders.

Organizations should actively participate in relevant industry safety bodies and initiatives.

Organizations should share safety occurrences using the locally applicable mandatory and voluntary safety reporting schemes.

The contracted organization must promptly advise the company of any incident, accident or non-standard occurrence related to the services provided to the company that has, or potentially could have, disrupted operations or jeopardized safety, and include any corrective or preventative actions being taken.

Organizations should examine available external occurrence reports, accident reports and safety promotion material and identify relevant lessons and necessary internal actions.

Common Enabler 1.4: Competence

Ensuring safety critical personnel are competent to fulfil their duties by having appropriate training, qualifications and experience.

FLIGHT CREW COMPETENCE

The aircraft operator must have an appropriate procedure for the initial selection of flight crew that considers aptitude and compatibility.

Flight crew on contracts with companies adopting these Safety Performance Requirements must meet Appendix 1 as a minimum standard. Where agreed by the company, the aircraft operator may use Competency Based Training in lieu of minimum experience requirements if the training program has been evaluated and meets the requirements of Flight Safety Foundation Offshore Safety Performance Requirements Flight Crew Competency Based Training Framework.

Flight crew must receive annual training to the standards of the responsible regulatory authority with two flight checks annually (or every six months for long-term contracted operations). The flight checks must include an annual instrument rating renewal (where applicable), proficiency or base check (non-revenue) and a route check (revenue-flight permissible). Where distinct climatic seasons (such as snow/ice) are experienced, training related to the seasonal change is recommended.

Before commencing flight duties in a new location on long-term contract, all flight crew must receive a documented line check that includes orientation of local procedures and environment when these differ from their previous operating location.

CONTINUING AIRWORTHINESS AND MAINTENANCE PERSONNEL COMPETENCE

Continuing airworthiness and maintenance personnel on contracts with companies adopting these Safety Performance Requirements must meet Appendix 1 as a minimum standard.

The aircraft operator and approved maintenance organization must have a program for the training of continuing airworthiness and maintenance personnel at least once every three years. The training must include human factors in maintenance, maintenance documentation and procedures and specific training on the aircraft and systems being maintained (refresher training, updates on new modifications or in-service lessons).

Common Enabler 1.5: Multi-crew Operations

Ensuring flight crew handling and monitoring duties are appropriately divided, defined and conducted in line with human factors principles.

Where multi-crew operations are conducted, procedures outlining the duties and responsibilities of all flight crew members must be prescribed by the aircraft operator; specifically 'Pilot Flying' and 'Pilot Monitoring' roles and tasks are to be defined.

All crew must have successfully completed Crew Resource Management (CRM) or Threat and Error Management (TEM) training at intervals not exceeding two years. Completion of an Aeronautical Decision Making (ADM) course is acceptable for approved single-pilot operations.

Common Enabler 1.6: Personnel Readiness

Ensuring flight crew and maintenance personnel are alert and fit-for-work.

FLIGHT CREW FATIGUE MANAGEMENT

Aircraft operators must apply the following flight time limits unless the responsible regulatory authority's requirements are more stringent:

Single-pilot operation	Two-pilot operation
8 hours daily flight time	10 hours daily flight time
40 hours in any 7 day consecutive period	45 hours in any 7 day consecutive period
100 hours in any 28 day consecutive period	120 hours in any 28 day consecutive period
1000 hours in any 365 day consecutive period	1200 hours in any 365 day consecutive period

A duty day must not exceed 14 hours and where 12 hours has been exceeded, this must be followed by a rest period of a minimum of ten hours. Crews on rotational assignments that arrive following overnight travel, or travel exceeding four time zone changes, must not be rostered for flying duties until the minimum ten hour rest period is met.

Regulatory approved fatigue management programs may be used in lieu of the above limits when endorsed by a Competent Aviation Specialist.

MAINTENANCE PERSONNEL FATIGUE MANAGEMENT

The aircraft operator or approved maintenance organization must establish a fatigue management policy to minimize the effects of acute and chronic fatigue amongst maintenance personnel. This must include maximum working hour limitations, minimum rest periods and roster schedules, and appropriate management review and approval of any extensions in exceptional circumstances.

The routine rostering of overnight maintenance must be reviewed by a Competent Aviation Specialist to agree if necessary to support the company's operations. The rostering of shifts of over 12 hours or minimum rest periods of less than 10 hours should only be considered in exceptional

circumstances, must be supported by a risk assessment and must be reviewed by a Competent Aviation Specialist to determine if acceptable.

DRUG AND ALCOHOL POLICY

The aircraft operator must have a Drug and Alcohol Policy, with associated Standard Operating Procedures that meet all requirements of the responsible regulatory authority and local legal system and is acceptable to the contracting company.

FLIGHT CREW HEALTH POLICY

The aircraft operator must have a Flight Crew Health Policy, with associated Standard Operating Procedures that meet all requirements of the responsible regulatory authority and minimize physical or mental conditions developing into a flight safety concern.

Common Enabler 1.7: Modern/Proven Technology

Ensuring the relative merits of safety features, design standards and service experience are assessed so as to select reliable and resilient aircraft and equipment, suitable for the intended operations.

Aircraft type design, certification standards, safety features, service experience and suitability for use should be assessed prior to use.

The aircraft basic equipment fit and configuration must meet the requirements listed in Appendix 2.

The use of aircraft that differ in equipment fit/configuration from the contracted aircraft (including temporary use) must be agreed with the company's Competent Aviation Specialist.

Common Enabler 1.8: Standards and Oversight

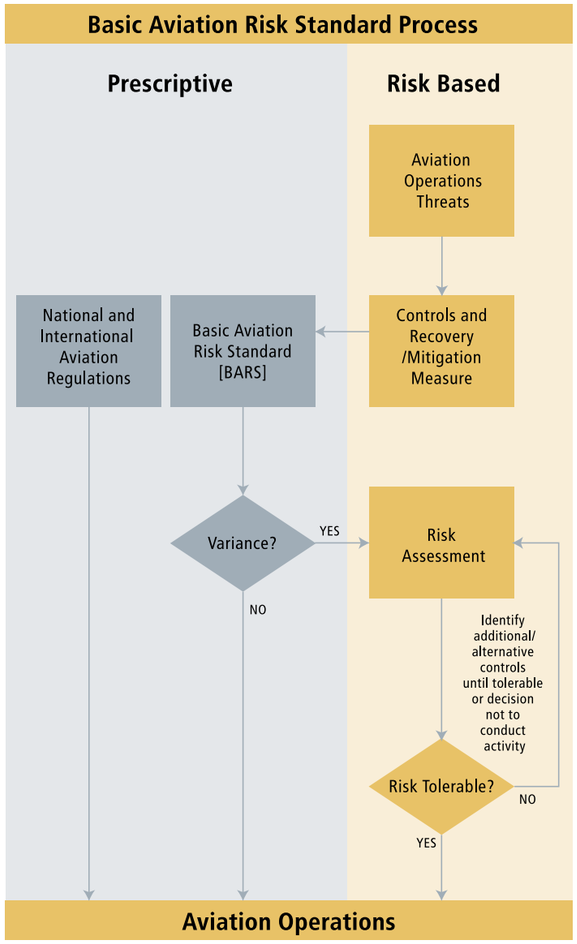
Ensuring operation with all necessary approvals and with an effective system of documented operational procedures.

Aircraft operators must be appropriately licenced, hold an Air Operator's Certificate (AOC) and approved by the company's established process and where necessary a Competent Aviation Specialist prior to use.

Sub-chartering (wet-lease or cross-hiring) by the aircraft operator must not be undertaken without approval of the contracting company. Regardless of ownership, contracted aircraft must be operated and controlled in accordance with the AOC of the aircraft operator(s) specified in the contract.

Aircraft operators must have an Operations Manual with the necessary content, approved (or when applicable, accepted) by the responsible regulatory authority. This may be in one or more volumes and include or be supported by appropriate procedures. The Operations Manual must cover normal and emergency operations and suitable for the operational circumstances and the aircraft types operated.

Figure 2: BARS Process.



Accident Threat 2.0: System Failure

Structural or propulsion/mechanical/avionic system failures of the helicopter that result in accident or escalate another threat

Accident Threat

System Failure

Accident Prevention Goals (Controls)

- Early Diagnosis of Potential Failures
- Safety Equipment Operating
- Enhanced Reliability
- Airworthiness Management
- Effective Maintenance
- Error Tolerant Designs
- Supply Chain

Control 2.1: Early Diagnosis of Potential Failures

Ensuring the early detection of impending critical failures to facilitate timely corrective action.

VIBRATION HEALTH MONITORING (VHM)

Multi-engine helicopters on long-term contract must be fitted with an approved VHM system capable of monitoring the rotor and rotor drive systems. VHM is recommended on single-engine helicopters when available.

The VHM system must measure vibration characteristics of rotating critical components during flight utilizing suitable vibration sensors, techniques, and recording equipment. Alert generation processes must be in place to reliably advise maintenance personnel of the need to intervene and help determine what type of intervention is required.

The VHM system must be certified to CS-29.1465 or an equivalent VHM regulatory standard.

The VHM system must be undergoing, or have previously completed, a Controlled Service Introduction under the oversight of a regulatory authority who has certified the helicopter type.

The operator must have documented procedures and trained personnel to:

(1) Collect the data including system generated alerts;

(2) Analyze and determine component serviceability; and

(3) Respond to detected incipient failures.

ENGINE USAGE AND TREND MONITORING

All helicopters operating on a long-term contract operated PC3 or PC2 with exposure (see Control 2.3) must be fitted with an electronic engine usage and trend monitoring system. The aircraft operator must follow procedures to routinely download the system, analyze engine trend data and take necessary actions so as to minimize the probability of engine failures.

PASSENGER TO CREW COMMUNICATION

Passengers must be able to communicate with the crew in the event of a technical problem being observed (e.g. a fluid leak or smoke from the rear of the cabin). For aircraft where the cockpit is separated from the cabin (for example in a medium helicopter where the front row of passenger seats face aft) means of communication can include access to a headset for a designated passenger, carriage of a crew member or some other suitable means to capture the crew's attention.

Control 2.2: Safety Equipment Operating

Ensuring safety and emergency equipment will operate as required when needed.

The aircraft operator must have procedures in place to manage the continuing airworthiness of the aircraft safety and emergency equipment to ensure that:

(1) Safety and emergency aircraft equipment carried is correctly installed and serviceable or clearly identified as unserviceable (when permitted);

(2) Defects are only deferred in accordance with an approved Minimum Equipment List (MEL) and/or procedures approved by the responsible regulatory authority.

Control 2.3: Enhanced Reliability

Ensuring flight operations and continuing airworthiness choices minimize the risk of critical failures and provide assurance of safe outcomes during all engine failure modes.

PERFORMANCE CLASS

Only multi-engine helicopters certified in Part 27/29 Category A operating in Performance Class (PC) 1 and PC2 are to be used in a hostile environment, at night or in instrument meteorological conditions.

For PC2 operations from offshore helidecks with exposure to a forced landing on water or a deck edge strike, departure procedures must be followed that take into account all available Flight Manual data.

Helicopters operating in PC3 (which includes all single-engine helicopters and multi-engine helicopters that are not certified in Part 27/29 Category A) must be limited to use in a non-hostile environment, under day visual meteorological conditions.

All daytime offshore flights using PC3 Helicopters must be scheduled so that they land at least 30 minutes prior to official sunset.

Piston engine helicopters must not be used in offshore operations.

ENGINE/POWERPLANT MODIFICATION STANDARD AND MAINTENANCE PROCEDURES

All helicopters operating offshore on a long-term contract to PC3 or PC2 with exposure must comply with any recommended modification standards or maintenance procedures issued by the engine or aircraft Type Certificate Holders to reduce loss of power events.

Accident Threat 2.0 (cont.)

In order to minimize the probability of loss of power events, the Type Certificate (TC) Holders may recommend modifications or procedures that are not necessary in normal operations but are of safety benefit when operating offshore. For a number of years manufacturers of multi-engine helicopters in particular have issued information notes to aid compliance with JAR-OPS 3 and now EASA Air Ops requirements.

Control 2.4: Airworthiness Management

Ensuring aircraft are airworthy and reliable.

The aircraft operator must have procedures in place to manage the continuing airworthiness of its aircraft to ensure that:

(1) The aircraft are maintained in an airworthy condition;

(2) Operational and role related aircraft equipment carried is correctly installed and serviceable or clearly identified as unserviceable (when permitted);

(3) The certificate of airworthiness (or equivalent) remains valid;

(4) The aircraft and its installed equipment is maintained in accordance with an appropriate, approved or accepted Maintenance Program;

(5) Airworthiness directives and service bulletins are appropriately assessed;

(6) Modifications and repairs are done in accordance with approved or accepted design data as applicable;

(7) Defects are only deferred in accordance with an approved Minimum Equipment List (MEL) and/or procedures approved by the responsible regulatory authority;

(8) An effective maintenance program is maintained that takes into consideration equipment fit, usage, operating environment and reliability;

(9) An effective reliability program is in place to monitor if the aircraft maintenance program tasks are effective and their periodicity adequate (see also Controls 2.1 and 2.3);

(10) An effective process for scheduling of maintenance is in place;

(11) Accurate and complete definition of the configuration of individual aircraft and aircraft records are maintained (including mass and balance records and Technical Log system);

(12) Control of maintenance data to be used by maintenance organizations;

(13) Appropriate procedures form the management of Maintenance Check Flights, including coordination between flight operations, continuing airworthiness management and maintenance organization personnel;

(14) Prompt and effective liaison with the Type Certificate Holders; and

(15) Maintenance standards are defined and adhered to.

Control 2.5: Effective Maintenance

Ensuring maintenance is conducted to the required Maintenance Program and standards.

MAINTENANCE – GENERAL

The aircraft operator must have procedures in place for maintenance of aircraft that ensure:

(1) The aircraft are maintained in an airworthy condition in accordance with continuing airworthiness instructions;

(2) Maintenance is conducted in appropriate facilities, by approved and adequately resourced maintenance organizations and authorized personnel;

(3) Accurate and complete maintenance records are maintained; and

(4) Maintenance standards are adhered to.

CRITICAL MAINTENANCE TASKS (CMTs) AND INDEPENDENT INSPECTIONS

Maintenance tasks that involve the assembly or disturbance of any system that may affect flight path, attitude, or propulsive force, which, if errors occurred, could result in a failure, malfunction, or defect that would endanger the safe operation of the aircraft must be considered as a CMT.

CMTs must be clearly identified in maintenance worksheets or job cards.

CMTs must be subject to an Independent Inspection in accordance with established procedures, carried out by at least two persons, at least one of which is qualified and authorized to sign the Maintenance Release.

TOOL CONTROL

The aircraft operator must have procedures in place to control all tools, including (but not limited to): tool inventories, serialized marking of tools (or equivalent), controlled issue and return of tools, specific tool storage locations, routine inspection/ monitoring of tool storage locations and inspections of the aircraft before panel/compartment closures.

Control 2.6: Error Tolerant Designs

Ensuring design and continuing airworthiness practices minimize the probability and consequences of human error in maintenance.

Preference should be given to aircraft types and modifications that feature a human centered design, i.e. are tolerant of, or minimize the probability/consequence of, human error.

The aircraft operator must have a process to identify design features or maintenance requirements that increase the risk of critical error.

Design features or maintenance requirements that increase the risk of critical error should be drawn to the attention of the TC Holder or STC Holder by the aircraft operator.

The aircraft operator must have a process to mitigate, where practical, design features or maintenance requirements that increase the risk of critical error.

Control 2.7: Supply Chain

Ensuring provision of genuine, serviceable parts.

The aircraft operator must ensure that all parts accepted into stores and fitted to aircraft conform to approved design data, were previously appropriately released by an appropriate organization, are appropriately stored and are in a condition for safe operation.

Accident Threat 3.0: Aircraft Upset

Loss of control of the aircraft while in-flight or loss of situational awareness in relation to mobile vessels

Accident Threat

Aircraft Upset

Accident Prevention Goals (Controls)

Flightpath Management
Effective Use of Automation
Enhanced Situational Awareness

Control 3.1: Flightpath Management

Ensuring a safe flightpath with early identification of deviations and timely corrective action.

FLIGHTPATH PROCEDURES

Aircraft operators must include type-specific takeoff, climb, descent, approach and landing procedures in the Operations Manual, or use a TC Holder issued Flight Crew Operating Manual (FCOM).

Aircraft operators must include no-fault, mandatory go-around requirements in the Operations Manual.

NAVIGATION

The destination position must be verified on approach to all vessels and installations.

The location of mobile installations and vessels must be communicated to aircraft operators and be readily available in the flight planning area. Flight crew must confirm the location of mobile installations and vessels (both the destination and any that may be adjacent to the destination) before flight.

Control 3.2: Effective Use of Automation

Ensuring the maintenance of controlled flight with, or without, the use of automation.

An Autopilot or Automatic Flight Control System (AFCS) must be fitted for night or IFR flights.

Where an Autopilot or AFCS is fitted the aircraft operator must have an automation policy that ensures the appropriate use of automation to reduce cockpit workload. The policy must also include procedures for manual flight control to maintain flight proficiency.

Control 3.3: Enhanced Situational Awareness

Ensuring the awareness of external and internal threats.

AIRCRAFT CONTROL ON THE GROUND

A pilot must remain at the controls of the helicopter at all times aircraft engines are running.

ASSESSMENT OF WRONG DECK LANDING RISK

Aircraft operators must have a process to identify the relative risk (e.g. high, medium or low) of a wrong deck landing at a particular destination or vessel during flight planning. This should consider factors such as proximity of adjacent decks, physical similarity of adjacent installations or vessels, similarity in naming conventions, etc.

Aircraft operators must have procedures to review this risk during all pre-flight briefings and (if practical) verbalize in pre-landing briefings (unless it can be demonstrated the risk in that area is continuously low).

Courtesy: Bristow

Accident Threat 4.0: Surface/Obstacle Conflict

An airworthy helicopter under the control of flight crew is flown into the ground (or water) or an obstacle on or adjacent to the heliport/helideck

Accident Threat	Accident Prevention Goals (Controls)	
Surface/Obstacle Conflict	Enhance Space/Reduce Obstacles Detect/Avoid Obstacles	Night/IFR Flight Mitigations RADALT Procedures/Use

Control 4.1: Enhance Space/Reduce Obstacles

Ensuring sufficient clearance from obstacles for safe operation.

For operations at night or under IFR to offshore destinations, aircraft operators must have defined Airborne Radar Approach (ARA) procedures that require:

- Consideration of the location of all known fixed and moving obstacles;
- The use of a radar to provide course guidance to ensure obstacle clearance;
- A Minimum Descent Height (MDH) not less than 50ft above the helideck, determined by radio altimeter;
- A decision range of at least 3/4nm with adequate obstacle clearance in the missed approach from any destination for which an ARA is planned; and
- That the approach shall only be continued beyond decision range or below the MDH when visual reference with the destination has been established.

Where approved by the responsible regulatory authority, GPS based approaches can be used at night or in IMC, however a reliable means of obstacle identification is still necessary.

Control 4.2: Detect/Avoid Obstacles

Ensuring the detection of adjacent obstacles so when necessary take timely corrective action.

TERRAIN AWARENESS WARNING SYSTEM

Aircraft that are to fly under IFR or at night or over mountainous terrain must be fitted with a serviceable Class A Helicopter TAWS, certified in accordance with an appropriate Technical Standards Order, with offshore specific modes where available.

The aircraft operator must have procedures for any user-adjustable TAWS features, ensuring regular database updates and for actions to be taken by the flight crew in the event of an alert.

Flight crew training must include the response to TAWS alerts.

EXTERNAL VISION AND OBSTACLE DETECTION AIDS

To improve situational awareness (of obstacles during takeoff, landing or taxi, personnel/vehicle movements around the aircraft on the ground and the aircraft external condition, such as open panels or damage/leaks/fire), sensors and/or mirrors should be provided to assist the crew on aircraft on long-term contracts.

Control 4.3: Night/IFR Flight Mitigations

Ensuring effective preparation that enables safe operation in Night and IFR conditions.

NIGHT – PASSENGER FLIGHTS

A risk assessment by the aircraft operator must be performed before commencing night passenger flights from a new operating location (or upon changes in local SAR capability). The risk assessment must include:

(1) The existence, availability and effectiveness of available night SAR resources;

(2) SAR response times; and

(3) Survival times of personnel given environmental conditions and mitigating measures (such as survival suits).

NIGHT/INSTRUMENT METEOROLOGICAL CONDITIONS (IMC) PROCEDURES

Flights flown at night or in IMC must be operated by two-pilots who hold valid and current instrument ratings using Standard Operating Procedures (SOPs) contained in the Operations Manual.

Flights flown at night or in IMC must be conducted in a multi-engine helicopter and must be in compliance with an IFR flight plan.

NIGHT/IFR – SIMULATOR TRAINING

For long-term contracts, crews operating at night or under IFR must attend initial and annual type-specific simulator training. Flight Training Devices may be used when they are available for that aircraft type and endorsed by a Competent Aviation Specialist.

NIGHT OR IFR – APPROACH/LANDING RECENCY

IFR and night approach recency must comply with the responsible regulatory authority's requirements, but for offshore operations shall include at least three night offshore helideck takeoff and landings for each pilot in the preceding 90 days.

SPECIAL VFR PROCEDURES

Routine planned use of Special VFR procedures must only be used in a two-crew operation and only in a non-hostile environment and only if endorsed by a Competent Aviation Specialist.

Control 4.4: RADALT Procedures/Use

Ensuring the provision of reliable RADALT data to provide clear and reliable awareness of height above sea level.

All offshore helicopters must be equipped with at least one radio altimeter (RADALT) with dual displays (including analogue indication), with a visual alert and Automated Voice Alerting Device (AVAD) capability.

The radio altimeter must be serviceable for any flight at night or conducted under IFR (even if deferrable in the regulatory approved MEL).

Visual/audio alerts may alternatively be provided by TAWS.

The aircraft operator must have procedures for any user adjustable AVAD features and for actions to be taken by the flight crew in the event of an alert.

Courtesy: HeliOffshore

Accident Threat 5.0: Heliport and Helideck

Collisions, loss of control on the ground, fires and other accidents related to the design and operation of onshore heliports or helidecks

Accident Threat	Accident Prevention Goals (Controls)	
Heliport and Helideck	Vessel Pitch, Roll and Heave (PRH) Limits Heliport and Helideck Management	Multiple Helicopters Operations Heliport and Helideck Design

Control 5.1: Vessel Pitch, Roll and Heave (PRH) Limits

Ensuring a safe envelope for vessel movements to enable a safe landing and stability when on the helideck.

The Pitch, Roll and Heave of floating vessels must be measured as close to helideck level and centerline as possible in order to provide accurate and reliable readings to be communicated to the helicopter from the vessel.

Significant changes in PRH or in vessel direction or any circumstance where vessel control is lost must be reported to the helicopter crew both prior to landing and while on the helideck.

The aircraft operator must have aircraft specific pitch, roll and heave rate landing limits (such as the Helideck Certification Agency Helideck Landing Limits) documented in their Operations Manual. Aircraft operators must conduct a risk assessment prior to commencing night or IMC operations and supplement these limitations if necessary. These results must be considered as part of a pre-commencement risk assessment (see Enabler 1.2).

The flight crew must verify that the reported PRH is within limits before landing.

Control 5.2: Heliport and Helideck Management

Ensuring effective maintenance and operation of helidecks and heliports to enable safe operations.

OPERATIONAL MANAGEMENT

All heliports and helidecks must have personnel who are responsible for overseeing and managing heliport/helideck operating standards in accordance with documented procedures and as part of a Safety Management System. Personnel designated as being responsible must understand the heliport/helideck procedures, local aviation regulations and certification requirements of the facility.

HELIDECK CONTROL – HELICOPTER LANDING OFFICER (HLO) AND HELICOPTER LANDING ASSISTANTS (HLA)

All offshore installations must have a HLO available for all helicopter movements with relevant duties and responsibilities clearly outlined in a current and up-to-date HLO Manual.

HLO and assistants must undergo initial and recurrent training every two years in accordance with OPITO standards (or an acceptable alternative standard).

COMMUNICATION

For manned installations and vessels there must be procedures to verify that the helicopter is on approach to the correct destination. There must also be a corresponding ability to communicate visually or verbally if an incorrect approach has been identified.

CLOSED DECKS

If a helideck is closed (for any reason other than simply it is unmanned) it must be clearly marked as such. Markings may include physical deck markings and status lights.

INSPECTIONS

In addition to reviews required by regulatory authorities, all company owned and/or operated Heliports and Helidecks must have an annual helideck inspection conducted by a Competent Aviation Specialist or aircraft operator.

Documented findings and action plans resulting from any inspection must be retained by the Helideck Landing Officer (HLO).

HELIPORT AND HELIDECK ASSESSMENTS

Aircraft operators must conduct landing site assessments prior to commencing operations to validate suitability of performance and operating limitations. These results must be considered as part of a pre-commencement risk assessment (see Enabler 1.2).

Prior to any night operations to new-build helidecks, or to helidecks with major changes in lighting installations, there must be a night validation flight that assesses all aspects of the helideck lighting.

Consider the following when planning the evaluation flight:

- Use of experienced personnel such as Check and Training Flight Crew;
- Performing the flight as soon as practicable during operational start-up; and
- Assess the night lighting in ambient conditions relevant to the operating environment (as opposed to assessing in a brightly illuminated dry dock/harbour).

HELICOPTER/SHIP OPERATIONS

All helicopter-to-ship operations must be conducted in accordance with the standards contained in the International Chamber of Shipping (ICS) Guide to Helicopter/Ship Operations.

Vessel activities typically include marine pilot transfer, tanker support, seismic crew transfer and medical evacuation.

Control 5.3: Multiple Helicopters Operations

Ensuring adequate clearance when multiple aircraft operations occur to avoid confliction.

Operations requiring the landing of a second helicopter to an offshore helideck (routinely or for occasional use, such as to support the maintenance of an unserviceable helicopter on deck) must be risk-assessed and endorsed by a Competent Aviation Specialist prior to the activity.

Control 5.4: Heliport and Helideck Design

Ensuring the physical design of helidecks and heliport, their markings, lighting, emergency cover and all ancilliary systems are suitable for safe operations.

DESIGN

Use ICAO Annex 14, Volume II ('Heliports') and UK CAA CAP 437 'Offshore Helicopter Landing Areas' for design considerations when constructing, or performing major rework, to permanent long-term company owned and operated heliports or helidecks.

All new-build helidecks must conform to the design standards of ICAO Annex 14 Volume II Heliports and UK CAA CAP 437 'Offshore Helicopter Landing Areas', and be designed to accommodate the largest helicopter anticipated for use in the life of the structure.

Bow mounted helidecks on FPSOs may require decks with a larger than normal diameter up to 1.5D (D = overall length of the helicopter with rotors turning) due to Pitch Roll and Heave (PRH) considerations.

Obtain advice from a Competent Aviation Specialist early in the design process and prior to the final design review.

Consider prevailing winds and the location of adjacent infrastructure/obstacles in relation to the proposed heliport or helideck departure and approach paths.

INSTALLATION/VESSEL MARKING

The marking of installations and vessels must be such that the crew of an approaching helicopter can visually verify identity before or at the Landing Decision Point. Where similar installation/vessels are in the same area, special care must be taken to make markings unambiguous.

Flight crew must have approach plates accessible during flight planning and when airborne that assist in the visual identification of the destination and adjacent installations and vessels.

PASSENGER TERMINAL AREA

Heliports must have passenger facilities offering a waiting area, survival suit issue and donning area (if required), suitable briefing area, security, basic amenities, protection from the elements and a barrier from the aircraft movement area. Incoming and outgoing passenger routes must be designated. Similar facilities should be available on installations and vessels.

DESIGNATED FREIGHT AREA

Heliports and helidecks must have a designated and secure freight area that provides a controlled environment clear of the aircraft movement area and public thoroughfare.

PARKING APRON

For all routinely used heliports, the parking apron area must be assessed by the aircraft operator as being suitable for their type of aircraft. Consider other transient aircraft traffic, helicopter operations, refueling and the Pavement Classification Number (PCN).

For long-term contracts, where practical, taxi lines appropriate for the contracted aircraft type must be painted on the apron for obstacle-clearance maneuvering purposes.

PERIMETER FENCE

Long-term onshore heliports must have a perimeter fence to prevent access by livestock, other animals and unauthorized pedestrians or vehicles.

Accident Threat 6.0: Weather

Weather and/or other environmental conditions force a helicopter to deviate from its intended flight path and results in an accident or prevents effective search and rescue

Accident Threat

Weather

Accident Prevention Goals (Controls)

- Effective Flight Planning
- Regular Reports/Forecasts
- Adverse Weather Policy/Use
- Aircraft Design
- Weather Radar

Control 6.1: Effective Flight Planning

Ensuring aircraft depart with sufficient fuel reserves on routings that take into account the anticipated weather conditions.

Offshore flights must be conducted on an Instrument Flight Rules (IFR) flight plan lodged with the relevant air traffic control service provider when possible. Visual Flight Rules (VFR) flight plans are permitted but must be lodged with a responsible party (air traffic control service provider, aircraft operator or company site representative) and flown under a flight-following regime.

Aircraft operators must outline thunderstorm and triggered lightning avoidance techniques in the Operations Manual.

Control 6.2: Regular Reports/Forecasts

Ensure flight crew receive accurate actual and forecast weather data to make sound planning decisions.

FLIGHT PLAN WEATHER DATA

Flight crew must be provided with reliable weather information when determining fuel loads during pre-flight planning.

DESTINATION WEATHER REPORTING

The following data must be communicated to arriving aircraft by either an Automatic Weather Observation System (AWOS) and/or trained weather observer:

- Maximum pitch and roll (degrees) and heave rate (meters/second) over a 20 minute period (offshore destinations);
- Wind direction and speed;
- Temperature;
- Barometric pressure; and
- Cloud ceiling height and visibility.

All equipment must be maintained and calibrated to a defined schedule and recorded in a calibration register.

When operating in a hostile environment to offshore destinations wave height and the status of the local rescue capability (e.g. stand-by vessels, fast rescue craft, offshore based SAR helicopters etc.) must be communicated to arriving aircraft.

Control 6.3: Adverse Weather Policy/Use

Establishing weather limitations consistent with the capabilities of the aircraft and rescue assets are applied to each flight, with provision for appropriate training in anticipated conditions.

ADVERSE WEATHER POLICY

An Adverse Weather Policy must be developed by the company in conjunction with the aircraft operator when weather conditions exist that are suitable for flying, but not suitable for practical offshore operations or search and rescue. Situations can include: excessive wind over helidecks prohibiting personnel movement to and from the helicopter, adverse sea conditions resulting in an unacceptable risk of immediate capsize or preventing effective offshore search and rescue, or man-made smoke haze degrading visual conditions in a jungle environment. The Adverse Weather Policy must outline clearly under what conditions flying operations should be restricted or temporarily halted and supported by appropriate procedures. The Adverse Weather Policy must consider the aircraft type and survival equipment in use, the available SAR capability and applicable Emergency Response Plans and be revalidated when material changes to these considerations occur.

WIND SHEAR/HELIDECK ENVIRONMENTAL TRAINING

Flight crew on long-term contract must have ongoing training addressing the identification and recovery measures associated with microburst and wind shear phenomenon, turbulence created by wind over an offshore facility's superstructure and gas venting.

COLD WEATHER TRAINING

Crew who operate aircraft in a cold weather environment (ground snow and ice) must undergo annual training prior to the onset of the winter season that addresses:

- Pre-takeoff inspections;
- In-flight icing and associated hazards;
- Cold weather operational takeoff, approach and landing; and
- Visibility and performance considerations.

Control 6.4: Aircraft Design

Ensuring the aircraft is capable of operating in the intended weather conditions.

Where an aircraft is intended to be operated into known icing conditions it must be certified for operation in icing conditions and all icing related systems must be serviceable. Aircraft certified for limited icing (i.e. without full rotor de-icing but with the ability to descend to lower, warmer altitudes, when ice build-up reaches a threshold) are acceptable but must not be used for flight into known icing conditions over frozen seas or other areas that lack warmer air at low altitude.

Control 6.5: Weather Radar

Ensuring flight crew are provided with accurate real-time weather information to allow the avoidance of adverse conditions.

All aircraft contracted to be able to operate under IFR or at night must be fitted with serviceable color weather radar having a minimum range scale of 2.5nm with one half nm range scale graduations. If the weather radar becomes unserviceable, the aircraft must not be flown in Instrument Meteorological Conditions (IMC), or at night unless the weather forecasts indicate there is no likelihood of thunderstorms, lightning, turbulence or icing.

Courtesy: Bristow

Accident Threat 7.0: Collision in the Air

A helicopter and object collide in the air

Accident Threat	Accident Prevention Goals (Controls)	
Collision in the Air	Altitude Management ATC Oversight Bird Strike Prevention	Airborne Collision Avoidance System (ACAS) High Intensity Strobe Lights (HISL)

Control 7.1: Altitude Management

Ensuring appropriate clearance from other aircraft and known bird activity.

Flight crew must comply with the ICAO cruising altitudes for both VFR and IFR flight unless circumstances require non-standard procedures.

Where known bird migratory routes or bird reserves are identified, flight crew must plan cruise altitudes greater than 3,000 feet Above Ground Level (AGL) wherever practical.

Control 7.2: ATC Oversight

Ensuring the optimum use of ATC services to maximize air traffic separation.

The Pilot-in-Command must consider the use of Air Traffic Controlled or Monitored airspace when determining cruising altitudes utilized during flight.

Control 7.3: Bird Strike Prevention

Ensuring effective bird control measures are in place to minimize bird strikes.

Passive bird control measures must be adopted at all onshore heliports and helidecks (where applicable) to manage the immediate habitat and sources of food.

Active bird control must be conducted at all onshore heliports when required. Where possible, birds must be dispersed or removed in accordance with local wildlife regulations.

Aircraft routing should consider bird sanctuaries, known nesting areas and migratory bird paths as far as practical.

Control 7.4: Airborne Collision Avoidance System (ACAS)

Ensuring timely detection of conflicting air traffic and avoidance of all traffic.

Aircraft to be flown in a High Traffic Risk Environment (HTRE) at night or under IFR while on long-term contract must be fitted with an ACAS II system that provide both traffic advisories and resolution advisories.

All aircraft to be flown VFR in a HTRE on long-term contract must be fitted with an ACAS I that provides at least traffic advisories.

Control 7.5: High Intensity Strobe Lights (HISL)

Ensuring conspicuity of the aircraft to all other traffic.

Aircraft on long-term contract operating in a HTRE must have high intensity strobe or pulse lights fitted (in addition to the standard red anti-collision beacons).

Courtesy: HeliOffshore

Accident Threat 8.0: Ground Collision/Handling

A collision between helicopter and other aircraft, vehicles or persons, or the unsafe loading of an aircraft

Accident Threat	Accident Prevention Goals (Controls)	
Ground Collision/ Handling	Weight, balance and Loading Passenger Briefing Flight Handling	Dangerous Goods Security and Check-In Control

Control 8.1: Weight, Balance and Loading

Ensuring the accurate and safe aircraft loading within approved limits.

WEIGHT DETERMINATION AND SAFE LOADING

Aircraft operators must have policies and procedures for the safe loading of the aircraft including the following:

- Actual passenger weight (including hand luggage) must be determined and used in all aircraft weight and balance calculations;
- Items of baggage and cargo must be separately weighed and detailed on the manifest;
- Items other than soft cover books or securely bound magazines must be prohibited from being taken into the cabin by passengers;
- Carry-on baggage, including, briefcases, laptop computers and newspapers must not be permitted in the cabin and all baggage must be secured in the baggage compartment. The area below seats must not be used for baggage or other items;
- If cargo is carried inside the passenger cabin during passenger carrying operations, it must be secured using nets and straps and hard-points that are suitable for the purpose and placed in front of the passengers where practical; and
- Cargo must not obstruct the normal or emergency exits.

WEIGHT AND BALANCE CALCULATIONS

Prior to takeoff, the Pilot-in-Command must ensure that the aircraft weight and center of gravity have been calculated and are within limits for safe flight.

The weight and balance calculations must be accomplished by a means authorized by the Operations Manual, and the details must be available in the cockpit at all times.

Control 8.2: Passenger Briefing

Ensuring passengers have the necessary knowledge to safely board, disembark and evacuate the aircraft.

PASSENGER BRIEFING AND BRIEFING CARDS

Passengers must be briefed on emergency procedures and the safety matters prior to flight, including:

- A general description of the helicopter and specific avoid/ danger areas;
- Smoking restrictions;
- Instructions on the limitations of use of Personal Electronic Devices (PEDs);
- Boarding and disembarkation instructions;
- The use of seat belts and shoulder harnesses;
- The proper donning and use of survival suits, including the use of any hoods or gloves;
- The brace position;
- Immediate actions upon a ditching;
- Demonstration on the use of life jackets and emergency breathing system used in that helicopter;
- The location and use of normal and emergency exits;
- Liferaft deployment and boarding;
- All other safety and survival equipment;
- The means of communication between crew and passengers; and
- The location of non-smoking and fasten seatbelt signs and briefing cards.

The briefing must cover the specific design features and equipment of the aircraft to be used and be presented in video format.

When the aircraft to be used has minor configuration differences to that shown in the video safety briefing, a verbal briefing to a documented script either on the aircraft or with reference to illustrations of the differences must be provided before flight. Differences are minor if they are readily comprehensible, easy to identify on the aircraft, small in number, don't introduce a new risk of injury if misused and don't have an adverse effect on survivability. If the differences are major, a dedicated video must be used for that configuration.

Accident Threat 8.0 (cont.)

All passengers must have access to a passenger briefing card specific to the aircraft configuration in use when seated.

The aircraft operator must have a procedure in place to ensure passengers are briefed after any sudden descent, return to base, or any other event that may cause concern.

MULTI-LANGUAGE BRIEFING AND PLACARDS

When the first language in the area of operations is not English, the aircraft operator must provide aircraft emergency placards, passenger briefings cards and briefings in the local language as well as English. For videos this may be achieved by sub-titles.

Control 8.3: Flight Handling

Ensuring manifests are accurate, and that passengers are appropriately escorted and seated.

PASSENGER SEATING POSITIONS

Passengers must be seated on the aircraft cognizant of emergency exit/push-out window sizes. Larger passengers, in particular those with large shoulder sizes, must be seated on rows adjacent larger exits. First time travelers should only be seated next to an emergency exit/push-out window when they are not between another passenger and that passenger's most direct egress route.

MANIFEST

A manifest that accurately reflects the occupants and cargo of the aircraft must be completed for each flight or sector in accordance with the Operator's approved procedure. The manifest must record the full name of each passenger and this data must be accessible by flight following personnel at all times to aid any emergency response.

PASSENGER CONTROL

A designated Passenger Control Officer (PCO) or Helideck Landing Officer (HLO) who is in a position to communicate with the crew at all times must control all passenger movements to and from the designated aircraft movement area. The PCO can be provided by the company or aircraft operator, and may be a crew member in a multi-crew operation.

The PCO and HLO must be identified using a distinguishing vest (or equivalent) if they are not a crew member of the aircraft.

ROTORS RUNNING LOAD/UNLOAD

When loading or unloading passengers from helicopters with rotors running, a member of the flight crew must remain at the controls and only perform cockpit duties related to the identification of external hazards and passenger movement around the aircraft.

The transfer of passengers whilst the rotors are running must be supervised by a designated PCO or HLO.

GROUND PROCEDURES

The Operations Manual must include requirements on ground handling and the maneuvering of aircraft including ground taxiing, towing and passenger loading procedures.

Control 8.4: Dangerous Goods

Ensuring only appropriately packaged and documented DG is carried in the appropriate aircraft hold locations.

The aircraft operator must comply with current International Air Transport Association (IATA) Dangerous Goods requirements (or similar requirements such as Title 49 of the US Code of Federal Regulations).

Irrespective of whether Dangerous Goods are to be carried, the aircraft operator or Heliport operator must have appropriate procedures and trained personnel to screen all cargo, baggage and passengers for Dangerous Goods. All flight crew must complete Dangerous Goods awareness training at least every two years.

Control 8.5: Security and Check-In Control

Ensuring passengers are qualified and approved to travel, and are free of prohibited items.

PASSENGER SECURITY AND QUALIFICATION CHECKS

The aircraft operator or heliport operator must ensure that an appropriate process is in place to verify the identity of passengers prior to boarding, ensure they meet safety training, medical or other currency requirements, search for prohibited items (prohibited either in-flight or at the destination) and deny boarding to passengers who are disruptive or showing signs of either alcohol or substance abuse.

The aircraft operator must also have a process to conduct inbound, onshore security checks in accordance with any local regulations or company contractual requirements.

PASSENGER CLOTHING POLICY

A clear passenger clothing policy must be agreed with the Company Aviation Specialist. Passengers must wear clothing and footwear appropriate to the environment being flown over (regardless of the flight duration) and compatible with survival and safety equipment the passenger is to be equipped with.

Passengers must be prohibited from wearing any type of headgear.

Accident Threat 9.0: Fuel

A helicopter has to conduct a forced landing or ditching after a loss of engine power as a result of fuel exhaustion or contamination, or suffers a fire during hot refueling

Accident Threat	Accident Prevention Goals (Controls)	
Fuel	Hot Refueling Procedures Fuel Checks Flight Planning	Offshore Alternates Fuel Reserves Fuel Storage, Testing and Inspection

Control 9.1: Hot Refueling Procedures

Ensuring hot refueling is completed safely.

Hot refueling (with engines running) must only be conducted when considered operationally necessary. Hot refueling with gasoline and wide cut turbine fuel is prohibited.

If conducted, aircraft operators must have a procedure for hot refueling which includes the following requirements:

- No passengers are to be on-board during refueling unless the Pilot-in-Command assesses that it is safe to do so. Passengers must receive a safety brief prior to refueling. No side-well seats are to be occupied (e.g. Bell 212, 214, 412);
- Firefighting capability must be available and manned;
- The aircraft operator's Operations Manual must detail all aspects of hot refueling, including personnel training, sequence of aircraft grounding and duties of personnel required. A minimum of three personnel for helicopter operations – one for refueling, one for pump shut-off and one for fireguard;
- Radios must not be used during refueling unless in emergency circumstances;
- Prior to removing the fuel cap and inserting the fuel nozzle into the aircraft fuel tank, or connecting a pressure hose, bonding wires running from the fuel station and from the fuel hose to the aircraft must be connected;
- When refueling is completed, the flight crew member must verify that all equipment is removed, the fuel cap has been securely replaced and the aircraft is properly configured for flight; and
- Correct fuel loads must be confirmed by the Pilot-in-Command prior to departure.

Refueling while an Auxiliary Power Unit (APU) is running but without engines operating does not constitute hot refueling.

Control 9.2: Fuel Checks

Ensuring the expected fuel quantity is aboard.

The aircraft operator must have procedures in place that require the Pilot-in-Command to ensure the required amount of fuel is on-board the aircraft prior to each flight.

Control 9.3: Flight Planning

Ensuring accurate flight plans are prepared.

Offshore flights must be conducted on an Instrument Flight Rules (IFR) flight plan lodged with the relevant air traffic control service provider when possible. Visual Flight Rules (VFR) flight plans are permitted but must be lodged with a responsible party (air traffic control service provider, aircraft operator or company site representative) and flown under a flight-following regime.

Control 9.4: Offshore Alternates

Ensuring offshore alternates are only used when OEI performance and alternative decks are guaranteed.

One-way fuel computations and offshore-only alternate diversions must not be used unless the offshore destination has been approved for OEI landings by a Competent Aviation Specialist, and, to the extent practical, the alternate helideck availability is guaranteed.

This control requires helicopters to be flown to a destination or alternate destination suitable for the conduct of One Engine Inoperative (OEI) landings. In normal operations this requires onshore alternates to be carried at all times.

Control 9.5: Fuel Reserves

Ensuring aircraft depart with sufficient fuel reserves to avoid fuel exhaustion.

INSTRUMENT FLIGHT RULES (IFR) FUEL RESERVES

In addition to operational holding fuel requirements, fuel loads must cover fuel used during start-up, taxi, en route, approach and transit to the alternate destination (if required).

Additional variable reserves of 10% of the total trip fuel plus 30 minutes flight time as fixed reserve must be carried.

VISUAL FLIGHT RULES (VFR) FUEL RESERVES

Fuel loads must cover the planned route. An additional variable reserve of 10% of the total trip fuel plus 30 minutes flight time as fixed reserve must be carried.

Control 9.6: Fuel Storage, Testing and Inspection

Ensuring the quality of the fuel dispensed to aircraft is acceptable.

FUEL STORAGE

Additional storage requirements:

- Fuel Certificates of Release should be inspected prior to resupply commencing and be retained;
- Storage tanks must have floating suction or minimum standpipe;
- Bulk deliveries must be filtered into storage tanks;
- Fuel systems must be identified by a placard during the settling period indicating the time when settling will be completed;
- Steel tanks must be lined with an approved epoxy liner unless the tanks are constructed of stainless steel; and
- Company new-build fuel systems must have stainless steel and connection welded plumbing.

FUEL TESTING

Fuel dispensed to an aircraft must be tested with water detector capsules or an equivalent that is able to test for water in suspension, and visually inspected for contaminants. Where fueling is conducted onshore by a recognized supplier with an effective quality system, an equivalent level of risk management may be demonstrated if appropriate procedures are in place and subject to third-party audit.

Pilots must take (or witness the taking of) a fuel sample from the delivery side of the fuel system and as close as possible to the delivery nozzle of all offshore refueling installations prior to each refueling operation.

The Pilot-in-Command must verify that the quality of the fuel being uplifted is acceptable for operation of the aircraft.

FUEL FILTRATION

Fuel delivery systems, including portable/mobile systems, must be fitted with water blocking filtration of the 'Go/No-Go' types. Filter canisters must be marked with the next date of change or inspection cycle. All filters must be replaced at least annually or at specified pressure differentials as annotated on the filter housing or as recommended by the manufacturer.

FUEL SAMPLING

A fuel sample, taken from each aircraft fuel tank sump prior to the first flight of the day, must be retained by the aircraft operator until the completion of the day's flying.

A fuel sample, taken from the fuel storage facility sump, which must be the lowest point in the system, must be retained until the completion of the day's flying.

An additional sample must be taken after fuel storage facility resupply, having allowed the fuel to settle one hour per one foot of fuel depth (or three hours per meter). Fuel must not be dispensed until after the sample has been inspected and the sample retained until the completion of the day's flying.

A fuel sample, taken from each delivery nozzle each day prior to first use, must be retained until the completion of the day's flying.

All fuel samples must be tested using water detector capsules, or an equivalent that is able to test for water in suspension, and visually inspected for contaminants prior to storage in a clear glass jar with screw-top-lid, appropriately labeled.

REFUELING SYSTEM INSPECTION

An annual inspection of fuel storage facilities and delivery systems must be conducted by the company designated Competent Aviation Specialist or aircraft operator. The inspection must include a review of the condition of the facility, scheduled maintenance, microbe growth detection and refueling procedures (covering daily testing, sampling and sample retention practices).

Where fueling is conducted by a recognized supplier, with an effective quality system, using internationally accepted practices, an equivalent level of risk management may be considered as being in place if all applicable procedures are being complied with.

DRUMMED FUEL

Aircraft operators who make use of drummed fuel in the course of their operations must have a procedure in place addressing the management and use of drummed fuel stock. The following performance requirements must be addressed:

Storage:

- Drums must be stored:
  - horizontally with access bungs at the 3 and 9 o'clock positions; or
  - vertically with drum top cover in place to prevent the accumulation of water on the drum lid; and
- Minimal contact with the ground (using wooden slats or equivalent) and under cover.

Quality:

- Fuel must be consumed within its Aviation Release Note certification date. Where authorized testing of out-of-date fuel is permitted by the fuel provider and the original certification period is extended, drummed fuel may be used up until that date but not exceeding two years. The revised certification documentation must be retained for the duration the drummed fuel is held in stock.
- The access bungs must be tight and the seals unbroken prior to use;
- The fuel must be sampled and include a positive test for the presence of water using water detecting capsules or paste;
- The refuel pump must be equipped with a Go/No-Go filter; and
- Before fueling the aircraft, a small amount of fuel must be pumped into a container to remove any contaminants from the hose and nozzle.

Usage:

To provide optimum opportunity for any contaminants to settle, drums must be brought to the vertical three hours prior to testing. Where this is not practical (e.g. SAR, Emergency Response, etc.) all performance requirements of this control must be followed.

Courtesy: HeliOffshore

Accident Survival Goals (Defences) 20.0: Aircraft Accident

Mitigating defences in the event of an aircraft accident

Defence 20.1: Impact Survival

Ensuring occupants survive a crash impact.

AIRCRAFT CERTIFICATION STANDARDS

Aircraft designed to the latest certification standards have increased crashworthiness, survivability characteristics and other design safety features when compared to those aircraft certified to older standards (e.g. crashworthy seating, crash resistant fuel systems, ditching performance, etc).

UPPER TORSO RESTRAINT

All helicopter crew and passenger seats must be fitted with upper torso restraints that must be worn at all times. The use of seat belt extensions that interfere with the full effectiveness of the upper torso restraint is prohibited.

PUBLIC ADDRESS (PA) SYSTEM

The helicopter must be fitted with a PA system of sufficient clarity and volume so that passengers can understand instructions from the crew at all times during flight (even when wearing any hearing protection).

Defence 20.2: Flotation

Ensuring the aircraft floats after a ditching or survivable water impact.

Offshore helicopters must be fitted with an emergency flotation system designed to cope with the sea conditions that are reasonably likely in the actual area of operations so as to reduce the risk of capsize before evacuation into liferafts.

Automatic float deployment systems must be fitted on helicopters operated on long-term contracts intended to be operated in offshore in IMC or night conditions, or offshore in a hostile environment.

Note that the success of the flotation system is partly dependent on the application of Control 6.3 (Adverse Weather Policy).

Defence 20.3: Underwater Escape

Ensuring the occupants can escape in the event of a capsize or submersion.

HELICOPTER UNDERWATER ESCAPE TRAINING (HUET)

All flight crew and passengers must complete a HUET course to a recognized standard (e.g. OPITO) that includes the use of a Modular Egress Training Simulator (METS) at least every four years, unless local regulation requires greater frequency or an established internal variance process has been approved by a Competent Aviation Specialist.

SEATING LAYOUT

Seating must be laid out so that every occupant has reasonable access to at least one route (and ideally two) for emergency egress through an exit of sufficient size for the occupant when wearing survival equipment, that is within direct sight from their seated position, has suitable hand-hold options en route, has no more than two other occupants (ideally one) between them and escape. This control is also relevant to escape when the helicopter is floating.

EMERGENCY EXIT LIGHTING SYSTEM

Emergency exit lighting system must be fitted to mark all emergency exits and push-out windows in the event of emergency evacuation.

PUSH-OUT WINDOWS

Emergency push-out windows must be installed in all locations that are suitable for emergency underwater egress (typically those greater than 430mm by 350mm). There must be a suitable means of opening that is resistant to inadvertent operation and which is suitably marked by placards and contrasting color(s).

EMERGENCY BREATHING SYSTEMS (EBS)

EBS compliant with an appropriate standard (e.g. UK CAA CAP 1034) must be worn by passengers for operations over a hostile offshore environment. Passengers must have received training in EBS use and EBS deployment must be covered in pre-flight safety briefings.

Defence 20.4: Sea Survival

Ensuring the occupants can survive either in a raft or in the water.

LIFE JACKETS

Constant wear, passenger life jackets compliant with an appropriate TSO, with design features to prevent the life jacket riding up when in the water, must be worn at all times in offshore operations.

SURVIVAL SUITS

Survival suits, compliant with an appropriate standard, must be provided to crews and passengers for helicopter offshore operations in hostile environments and when required by a risk assessment. The passenger suit, supplemented by the clothing determined by the passenger clothing policy (Control 8.5), must provide thermal insulation consistent with the expected SAR recovery time. Passenger suits must be worn fully zipped, although hoods and gloves need not be worn. The suit must be compatible with the life jacket used.

LIFERAFTS

For helicopters with a seating capacity of more than nine passengers, two liferafts compliant with an appropriate TSO must be carried. For helicopters with a seating capacity of nine passengers or less, at least one liferaft compliant with an appropriate TSO must be carried.

Where a helicopter is fitted with two liferafts, each must have an overload capacity that is equal or greater to the total occupants of the helicopter. Where helicopter is fitted with one liferaft it must have a normal capacity equal or greater to the total occupants of the helicopter.

For operations in a hostile environment the liferafts must comply with ETSO-2C505 or an equivalent standard for hostile environment liferafts.

All liferafts must be reversible or self-righting, double chambered and capable of being tethered to the aircraft and be readily accessible in the event of ditching.

At least one liferaft (ideally two) must be an external liferaft, with a means of activation available in the cockpit and externally. To prevent in-flight deployment there must not be passenger access to the means of activation in-flight.

The airframe in the vicinity of the liferaft when deploying and when deployed must be free of projections that could damage the liferaft.

Defence 20.5: Land/General Survival

Ensuring the occupants can survive on land or deal with small fires and medical emergencies.

RESCUE FIREFIGHTING

All heliports or airfields must have a means of providing a fire and rescue capability commensurate with the potential risk. Qualified personnel must receive training on the equipment provided, which must be appropriately maintained.

FIRST-AID KIT AND FIRE EXTINGUISHER

At least one first-aid kit and one fire extinguisher must be appropriately installed and accessible in flight.

SURVIVAL KIT

Survival kits appropriate for the geographical location and climatic conditions (offshore, jungle, arctic, desert, etc.) and the number of occupants of the aircraft must be carried for those operations where search and rescue response times would require use of the equipment.

Defence 20.6: Alerting

Ensuring timely alerting and location identification to aid SAR services.

FLIGHT FOLLOWING AND COMMUNICATION

All aircraft operating in hostile environments or used for SAR missions must be fitted with satellite flight following systems. The position reporting frequency must be appropriate for the operation and at least every two minutes. The system must be monitored by designated flight following personnel with no secondary duties who are able to initiate the Emergency Response Plan if required. There must be a reliable means of direct communication available between the aircraft and flight follower throughout the flight.

Where flights are conducted outside of controlled airspace in a non-hostile environment, the aircraft operator must establish a system of flight following appropriate for the operation. An Emergency Response Plan must be able to be activated at all times in the event of distress or loss of communications.

EMERGENCY LOCATOR TRANSMITTERS

An Emergency Locator Transmitter (ELT) meeting the requirements of Technical Standard Order (TSO) 126 or equivalent operating on both 406MHz and 121.5MHz must be fitted to all contracted aircraft.

This must be an Automatically Deployable ELT (ADELT) on helicopters on long-term contracts intended to be operated offshore in instrument meteorological or night conditions, or offshore in a hostile environment.

All ELTs must be registered with the appropriate national agency and the responsible parties registered as ELT contacts are to be detailed in the aircraft operator's Emergency Response Plan.

Accident Survival Goals (Defences) 20.0 (cont.)

FLIGHT CREW PLB

Flight crew operating helicopters in hostile environments must have access to a voice-capable and GPS-capable 406MHz/121.5MHz Personal Locator Beacon (PLB)/Survival ELT and carry any other necessary survival equipment on their person.

PASSENGER PLBs

For operations in any environment where the SAR response time is considered excessive through risk assessment (and therefore wider dispersion of survivors is possible), a 121.5MHz PLB, compliant with an appropriate standard, must be carried (normally attached to the life jacket or survival suit).

Defence 20.7: SAR/Emergency Response

Ensuring adequate SAR or helideck/heliport emergency services are available in a timely and adequately resourced manner.

EMERGENCY RESPONSE PLANS

All aviation operations (including company owned or operated heliports) must have an Emergency Response Plan (ERP) commensurate with the activity undertaken that covers: documented land-before-last-light limitations, exposure considerations, local Search and Rescue (SAR) capabilities, and hazards associated with the surrounding environment.

ERPs must detail lines of communications between the company and aircraft operator.

Offshore installations and vessels must make provision for aviation emergencies on and around their facilities when developing Emergency Response Plans.

The aircraft operator must conduct a relevant exercise that activates its ERP at least annually either locally or at a regional/corporate level and demonstrate that any necessary improvements are made.

Emergency drills (at a minimum desktop) with aviation related objectives must be conducted within 30 days of a contract's initiation, and then at least annually for ongoing operations that:

- Test the integrity of the ERP by conducting exercises on worst-case scenarios involving last-light, weather and aircraft disposition; and
- Test and validate bridging communications between the company, the aircraft operator and all SAR resources.

Note that the success of the emergency response in the event of a ditching or water impact is partly dependent on the application of Controls 4.3, 6.3 and the available SAR capability.

DEDICATED SAR SUPPORT

For all operations in a hostile environment, the company must conduct a risk assessment to determine if contracting for a dedicated SAR capability is necessary to supplement locally available SAR assets. If necessary, such a service must be contracted.

Defence 20.8: Post-Accident

Ensuring other actions to mitigate the accident or prevent reoccurrence are in place.

COCKPIT VOICE RECORDER (CVR)/FLIGHT DATA RECORDER (FDR)

Multi-engine helicopters must be fitted with a crash-protected Cockpit Voice Recorder and Flight Data Recorder that meet a recognized recorder and crash protection standard with an attached Underwater Locator Beacon (ULB).

All single-engine helicopters on long-term contract must have some form of either:

(1) Cockpit voice and or image recording capability designed to be crash-resistant or;

(2) Flight data recording capability designed to be crash-resistant, adequate for flight path reconstruction.

INSURANCE

The contracting company must determine the level of insurance they require in accordance with company risk management standards prior to contract commencement. The aircraft operator shall ensure insurance is in place. Such insurance must not be cancelled or changed materially during the course of the contract without at least 30 days written notice to the company. The company must be named as an additional insured under the policy.

Courtesy: HeliOffshore

Appendices

Appendix 1:

Personnel Qualifications, Experience and Recency

Pilot-in-Command

Qualifications	>5700 kg Multi-engine	<5700 kg Multi-engine	Single-engine
Licence	ATPL	CPL	CPL
Instrument Rating[1]	Command, multi-engine	Command, multi-engine	Not required
Experience			
Total Hours	3000	2000	1500
Total Command	1500	1000	1000
Total Command Night Offshore	25 at night offshore	25 at night offshore	25 at night offshore
Total Command Multi-engine	500	500	N/A
Total Command on Type[2]	100	100	100
Experience in Topographical Area	One year experience in area similar to specified in contract (arctic, offshore, high density altitude mountainous, jungle, international operations, etc).		

Co-pilot

Qualifications	>5700 kg Multi-engine	<5700 kg Multi-engine	Single-engine
Licence	CPL	CPL	CPL
Instrument Rating	Command	Co-pilot	
Experience			
Total Hours	500	250	250
Total Multi-engine	100	50	
Total on Type[2]	50	10	10

Both Pilot-in-Command and Co-pilot

Qualifications	
Total Hours previous 90 days[3]	50 hours, ten on the aircraft type
Night recency previous 90 days	Three night takeoffs and landings[4] [5]
Night helideck recency – previous 90 days	Three night helideck takeoffs and landings[4] [5]
CRM/ADM initial and refresher	Every two years
Dangerous Goods Awareness	Every two years
Accident and Violation Record	At least two years free of causing air accidents due to gross negligence or violations of regulations or procedures, subject to review by the company.

Maintenance Personnel

Qualifications	Chief Engineer	Certifying Engineer
Total time on Helicopters (whichever applicable)	Five years	Two years
Licence with appropriate Engine/Airframe/ Avionics Rating	Yes	Yes
Type Rating on the contract type[6]	Yes	Yes
Accident and Violation Record	At least two years free of causing air accidents due to gross negligence or violations of regulations or procedures, subject to review by the company.	

(1) All instrument approach aid recency required to support the activity must be maintained within regulatory requirements. Instrument Ratings are NOT required for operations designated as VFR only.

(2) Competency-Based Training (CBT) reviewed and endorsed by a Competent Aviation Specialist may be used in lieu of 100 hour requirement.

(3) If not met, a non-revenue check-flight by a qualified check pilot is required.

(4) In extreme latitudes, where night time is limited during summer months, a 'summer alleviation' to night recency can be implemented if agreed by the company prior to contract award (or by variation to the contract), provided a suitable process is documented to re-gain recency as the length of night time increases at the end of the defined summer alleviation period.

(5) Use of a simulator of the same type and series being flown may be used if agreed by a Competent Aviation Specialist provided the device has the capability of simulating the approach and landing to an offshore helideck. The specific device must be approved for that use by the responsible regulatory authority.

(6) In countries where the addition of a Type Rating to a Licence is not possible, then it must be demonstrated that the individual has received formal classroom and practical training equivalent to a Type Course.

Appendix 2:

Basic Aircraft Equipment and Configuration

In addition to the considerations of Enabler 1.7, helicopters must be fitted with equipment that meets:

1. All certification requirements of FAR-29/CS-29 or FAR-27/CS-27 applicable to the helicopter type for use in offshore operations;
2. All applicable equipment requirements of the main body of this Standard; and
3. All applicable equipment requirements of Appendix 4, for Transport Hoist, Medevac or SAR operations.

For convenience the following table cross-references the aircraft equipment and configurations requirements elsewhere in this standard.

✓ = Required – Unless Short term/Non-hostile/Day/VMC operations are marked N/R. See Remarks also.

× = Restricted from operation

N/R = Not required

N/A = Not applicable

Goal	Requirement Title (consult full text)	Short term	Long term	Non-hostile	Hostile	Day/VMC	Night/IMC	Remarks	Mission
1.2	FDM Download	N/R	✓	✓	✓	✓	✓	N/A	All
2.1	VHM	N/R	✓	✓	✓	✓	✓	Multi-engine	All
2.1	Engine Usage and Trend Monitoring	N/R	✓	✓	✓	✓	✓	PC3/PC2 with exposure only	All
2.3	PC1 or PC2	✓	✓	✓	✓	✓	✓	N/A	All
2.3	PC3	✓	✓	✓	✓	✓	×	N/A	All
2.3	Engine/Powerplant Modification Standard	N/R	✓	✓	✓	✓	✓	PC3/PC2 with exposure only	All
3.2	Autopilot or AFCS	✓	✓	✓	✓	N/R	✓	N/A	All
4.1 & 9.3	Radar	✓	✓	✓	✓	N/R	✓	N/A	All
4.2	TAWS	✓	✓	✓	✓	N/R	✓	Also over mountains	All
4.2	External Vision and Obstacle Detection Aids	N/R	✓	✓	✓	✓	✓	N/A	All
4.4	AVAD	✓	✓	✓	✓	N/R	✓	N/A	All
6.4	Icing Certification	✓	✓	✓	✓	N/R	✓	Icing conditions only	All
7.4	ACAS2	N/R	✓	✓	✓	✓	✓	HTRE only	All
7.4	ACAS	N/R	✓	✓	✓	✓	×	HTRE only	All
7.5	HISL	N/R	✓	✓	✓	✓	✓	HTRE only	All
8.2	Passenger Briefing Cards	✓	✓	✓	✓	✓	✓	N/A	All
8.2	Multi-language Placards	✓	✓	✓	✓	✓	✓	N/A	All
20.1	Upper Torso Restraint	✓	✓	✓	✓	✓	✓	N/A	All
20.1	PA System	✓	✓	✓	✓	✓	✓	N/A	All
20.2	Aircraft Flotation Systems	✓	✓	✓	✓	✓	✓	N/A	All
20.2	Automatic Float Deployment	N/R	✓	N/R	✓	N/R	✓	N/A	All
20.3	Seating Layout	✓	✓	✓	✓	✓	✓	N/A	All
20.3	Emergency Exit Lighting System	✓	✓	✓	✓	✓	✓	N/A	All

Appendix 2:

Basic Aircraft Equipment and Configuration (cont.)

Goal	Requirement Title (consult full text)	Short term	Long term	Non-hostile	Hostile	Day/VMC	Night/IMC	Remarks	Mission
20.3	Push-out Windows	✓	✓	✓	✓	✓	✓	N/A	All
20.3	EBS	✓	✓	N/R	✓	✓	✓	N/A	All
20.4	Life Jackets	✓	✓	✓	✓	✓	✓	N/A	All
20.4	Survival Suits	✓	✓	N/R	✓	✓	✓	N/A	All
20.4	Non-hostile Environment Liferafts	✓	✓	✓	×	✓	✓	N/A	All
20.4	Hostile Environment Liferafts	✓	✓	✓	✓	✓	✓	N/A	All
20.5	First-Aid Kit and Fire Extinguisher	✓	✓	✓	✓	✓	✓	N/A	All
20.5	Survival Kit	✓	✓	✓	✓	✓	✓	N/A	All
20.6	Satellite Flight Following and Long Range Comms	✓	✓	✓	✓	N/R	✓	N/A	All
20.6 & 14.4	Satellite Flight Following and Long Range Comms	✓	✓	✓	✓	✓	✓	N/A	SAR
20.6	Aircraft ELT	✓	✓	✓	✓	✓	✓	N/A	All
20.6	Aircraft ADELT	N/R	✓	✓	✓	N/R	✓	N/A	All
20.6	Flight Crew PLB	✓	✓	✓	✓	✓	✓	N/A	All
20.6	Passenger PLBs	✓	✓	✓(1)	✓	✓	✓	N/A	All
20.8	Crash protected CVR/ FDR/ULB	✓	✓	✓	✓	✓	✓	Multi-engine	All
20.8	Crash resistant recording	N/R	✓	✓	✓	✓	✓	Single-engine	All
12.1	Auto hover	✓	✓	✓	✓	N/R	✓	N/A	SAR
12.1	FLIR/NVIS	✓	✓	✓	✓	N/R	✓	N/A	SAR
12.2	Single Hoist	✓	✓	✓	✓	✓	✓	N/A	TH
12.2	Single Hoists	✓	✓	✓	✓	✓	×	N/A	SAR
12.2	Dual Hoists	✓	✓	✓	✓	N/R	✓	N/A	SAR
12.3-12.5	Ancillary Hoist Requirements	✓	✓	✓	✓	✓	✓	N/A	SAR TH
13.1-13.8	Role Equipment	✓	✓	✓	✓	✓	✓	N/A	SAR Med
13.9	Bubble Windows	✓	✓	✓	✓	✓	✓	N/A	SAR
14.1	Beacon Location/Marine Band Radio/AIS	✓	✓	✓	✓	✓	✓	N/A	SAR
14.2	Marine Band Radio/AIS	✓	✓	✓	✓	✓	✓	N/A	TH
14.3	Crew Comms	✓	✓	✓	✓	✓	✓	N/A	SAR TH Med

(1) If determined during risk assessment based on available SAR response capability.

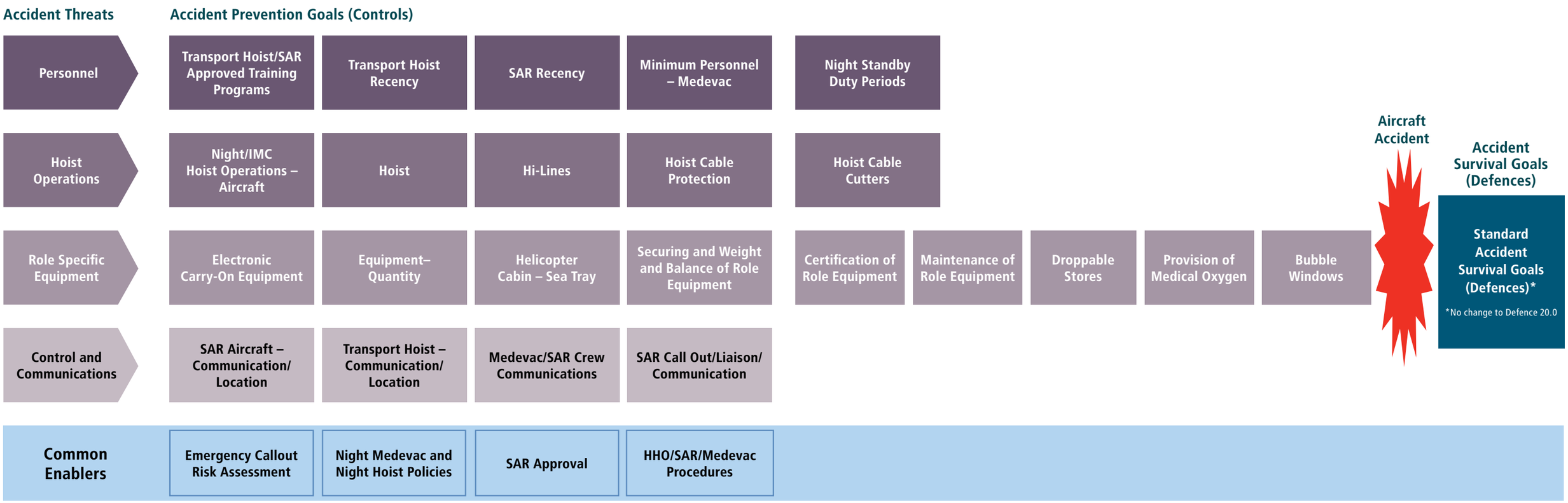
Appendix 3:

Abbreviations

ACAS	Airborne Collision Avoidance System
ADM	Aeronautical Decision Making
AFCS	Automatic Flight Control System
AGL	Above Ground Level
ALAR	Approach and Landing Accident Reduction
AIS	Automatic Identification System
AOC	Air Operator's Certificate
APU	Auxiliary Power Unit
ARA	Airborne Radar Approach
ATPL	Air Transport Pilot Licence
AVAD	Automatic Voice Alerting Device
AWOS	Automated Weather Observation System
BARS	Basic Aviation Risk Standard
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication (UK)
CBT	Computer Based Training
C of G	(Aircraft) Center of Gravity
CFIT/W	Controlled Flight into Terrain/Water
CPL	Commercial Pilot's Licence
CMT	Critical Maintenance Task
CRM	Crew Resource Management
CS	Certification Standard
CVR	Cockpit Voice Recorder
DG	Dangerous Goods
DSV	Diving Support Vessels
EASA	European Aviation Safety Agency
EBS	Emergency Breathing System
ELT	Emergency Locator Transmitter
ERP	Emergency Response Plan
FAR	Federal Aviation Regulation (USA)
FDM	Flight Data Monitoring
FDR	Flight Data Recorder
FLIR	Forward Looking Infra Red
FPSO	Floating Production and Storage Offload
FSF	Flight Safety Foundation
GPS	Global Positioning System
HISL	High Intensity Strobe Light
HLA	Helideck Landing Assistants
HLO	Helideck Landing Officer
HUET	Helicopter Underwater Escape Training
HTRE	High Traffic Risk Environment
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ICS	International Chamber of Shipping
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Conditions
LOC	Loss of Control
LOSA	Line Operations Safety Audit
Medevac	Medical Evacuation
MEL	Minimum Equipment List
METS	Modular Egress Training Simulator
MODU	Mobile Drilling Unit
MOP	Maintenance Observation Program
NVIS	Night Vision Imaging Systems
OEI	One Engine Inoperative
OIM	Offshore Installation Manager
OPITO	Offshore Petroleum Industry Training Organization
PA	Public Address
Pax	Passenger
PC	Performance Class
PCN	Pavement Classification Number
PCO	Passenger Control Officer
PED	Personal Electronic Device
PLB	Personal Locator Beacon
PNR	Point of No Return
PPE	Personal Protective Equipment
PRH	Pitch, Roll and Heave
SAR	Search and Rescue
SMS	Safety Management System
SOP	Standard Operating Procedure
TAWS	Terrain Awareness Warning System
TCAS	Traffic Collision Avoidance System
TCDS	Type Certificate Data Sheet
TEM	Threat and Error Management
TSO	Technical Standards Order
ULB	Underwater Locator Beacon
VFR	Visual Flight Rules
VHF	Very High Frequency
VHM	Vibration Health Monitoring
VMC	Visual Meteorological Conditions

Transport Hoist/Medical Evacuation (Medevac)/Search and Rescue (SAR)

Figure 3: BARS Bow Tie Risk Model – Schematic of Offshore Safety Performance Requirements.



10.0: Common Enablers

Accident Threat

Common Enablers

Accident Prevention Goals (Controls)

Emergency Callout Risk
Night Medevac and Night Hoist Policies
SAR Approval

Common Enabler 10.1: Emergency Callout Risk Assessment

Ensuring safety of flight is the prime consideration prior to dispatch on medevac or SAR operations.

The aircraft operator must have a risk assessment process so that the urgency of Medevac or SAR is separated from the safety-of-flight decision-making process.

Common Enabler 10.2: Night Medevac and Night Hoist Policies

Ensuring all stakeholders consider the increased risk in night operations and the policies supporting this are understood.

When required for the operation, the company must consult with the aircraft operator to develop night Medevac and Night Hoist policies.

Night medevac flights should only be conducted in life threatening situations and where stabilization until first light is not an option. The final decision to request a medevac must be made by the Offshore Installation Manager (OIM) in consultation with medical staff and the aircraft operator. The final authority on whether a medevac flight can be safely flown rests with the Pilot-In-Command.

Transport hoist operations should only be conducted at night when scheduling in daylight is not an option.

Common Enabler 10.3: SAR Approval

Ensuring relevant regulatory approvals are in place.

The aircraft operator must have any necessary approvals or exemptions necessary from the appropriate responsible regulatory authority in order to conduct both SAR and line/recurrent SAR training.

Common Enabler 10.4: HHO/SAR/Medevac Procedures

Ensuring all hoist/SAR and medevac operational activities are clearly documented and understood.

The aircraft operator must have comprehensive procedures for Transport Hoist, SAR and/or Medevac missions.

Courtesy: Aerossurance

Accident Threat 11.0: Personnel

Crews are adequately constituted, trained, current and rested

Accident Threat

Personnel

Accident Prevention Goals (Controls)

Transport Hoist/SAR Approved Training Programs
Transport Hoist Recency

SAR Recency
Minimum Personnel – Medevac
Night Standby Duty Periods

Control 11.1: Transport Hoist/SAR Approved Training Programs

Ensuring all crew assigned duties are appropriately trained and experienced.

All personnel assigned to Transport Hoist or SAR operations must have completed an approved training program specific to the task and the assigned role of the individual.

At least one SAR crew member must be qualified as a paramedic/emergency medical technician.

Control 11.2: Transport Hoist Recency

Ensuring all crew assigned to hoist operations are within defined recency limitations.

All Transport Hoist crew members must achieve a minimum of three hoist cycles (including transition to/from the hover) every 90 days or be subject to a hoist check flight with qualified hoist training personnel.

For night Transport Hoist operations all crew members must achieve a minimum of three hoist cycles (including transition to/from the hover) every 90 days or be subject to a night hoist check flight with qualified hoist training personnel.

Control 11.3: SAR Recency

Ensuring all crew assigned to SAR operations are within defined recency limitations.

For SAR hoist operations all SAR crew members must achieve a minimum of three hoist cycles to representative vessels (including transition to/from the hover) every 90 days or be subject to a SAR check-flight with qualified SAR training personnel.

Where SAR operations are to be conducted at night, all SAR crew members must achieve at least three hoist cycles at night to representative vessels (including transition to/from the hover) in the last 90 days or be subject to a SAR check flight with qualified SAR training personnel.

For SAR hoist operations all SAR crew members must achieve a minimum of three wet hoist cycles (including transition to/from the hover) involving winching persons from the water or liferafts every 90 days or be subject to a SAR check flight with qualified SAR training personnel.

All SAR crew members must achieve at least one offshore search (which may be an exercise) every 90 days or be subject to a SAR check flight with qualified SAR training personnel.

Where SAR operations are to be conducted at night, all SAR crew members must achieve at least one offshore search (which may be an exercise) at night (including the use of FLIR) every 90 days or be subject to a SAR check flight with qualified SAR training personnel.

Where air droppable liferafts or survival kits are to be used, all SAR crew members must achieve at least one deployment (including transition to/from the hover if necessary) every 180 days. If not current for SAR hoist operations three transition to/from the hover over the sea must also be completed every 90 days.

Where air droppable liferafts or survival kits are to be used at night, all SAR crew members must achieve at least one night deployment (including transition to/from the hover if necessary) annually. If not current for night SAR hoist operations three transition to/from the hover over the sea must also be completed at night every 90 days.

Control 11.4: Minimum Personnel – Medevac

Ensuring the minimum number and qualifications of medical personnel on medevac operations.

Qualified medical professionals meeting all offshore training requirements (HUET) must accompany patients in the cabin during any Medevac. Where there is a risk that the patient may need restraining for their own safety or the safety of others, at least two personnel should be in attendance in the cabin.

Control 11.5: Night Standby Duty Periods

Ensuring the flight crew are suitably rested for the type of operation.

Flight crew rostered for Medevac or Transport Hoist night duty must remain within approved transport flight crew duty periods (except where Medevac is conducted by SAR crew).

Flight crew rostered for SAR must remain within an approved flight crew duty periods but this may be a SAR specific roster (e.g. with extended duty time due to rest while on stand-by in appropriate accommodation near to the SAR base).

Such accommodation must allow for genuine uninterrupted sleep when not required for a call-out or planned training and must be considered when determining the response time. Such a SAR roster and the associated accommodation must be approved by a Competent Aviation Specialist.

Accident Threat 12.0: Hoist Operations

Aircraft are appropriately equipped for hoist operations

Accident Threat	Accident Prevention Goals (Controls)	
Hoist Operations	Night/IMC Hoist Operations – Aircraft Hoist	Hi-Lines Hoist Cable Protection Hoist Cable Cutters

Control 12.1: Night/IMC Hoist Operations – Aircraft

Ensuring that only suitable equipped aircraft are assigned to night/IMC hoisting operations.

Aircraft assigned to night/IMC Transport Hoist or SAR operations must be equipped with auto-hover capability.

Aircraft assigned to night SAR operations must be equipped with a Forward Looking Infra-Red (FLIR) and Night Vision Imaging Systems (NVIS) for each crew member.

Control 12.2: Hoist

Ensuring an appropriate hoist redundancy for the intended operation.

All aircraft assigned to Transport Hoist or SAR hoist operations must have at least one hoist.

Aircraft assigned to night/IMC SAR hoist operations must be fitted with two serviceable hoists.

Control 12.3: Hi-Lines

Ensuring the obstacles near the winching area can be avoided.

Hi-lines must be available to assist hoist operations.

Control 12.4: Hoist Cable Protection

Ensuring the protection of the hoist cable from fouling or snagging the aircraft.

Hoist cables must be protected from contact with aircraft structure.

Control 12.5: Hoist Cable Cutters

Ensuring there is a back up method of disconnecting a fouled cable from the aircraft.

Hoist Operators must have ready access to manual cable cutters (separate from any cable cutting integrated with the hoist).

Courtesy: Aerossurance

Accident Threat 13.0: Role Specific Equipment

Aircraft have appropriate role equipment

Accident Threat	Accident Prevention Goals (Controls)		
Role Specific Equipment	Electronic Carry-On Equipment Equipment – Quantity Helicopter Cabin – Sea Tray	Securing and Weight and Balance of Role Equipment Certification of Role Equipment Maintenance of Role Equipment	Droppable Stores Provision of Medical Oxygen Bubble Windows

Control 13.1: Electronic Carry-On Equipment

Ensuring a safe and reliable electrical power supply for the carry-on equipment that will not interfere with aircraft systems.

Electronic carry-on equipment to be used in-flight must be demonstrated to be compatible with aircraft systems and not cause interference. Battery powered equipment that cannot be recharged aboard the aircraft must be shown to have adequate battery life for the intended flight duration.

Control 13.2: Equipment – Quantity

Ensuring the provision of adequate medical and survival equipment.

Medical and survival equipment appropriate for an anticipated number of casualties and/or patients must be determined and carried on-board the aircraft. Transport hoist and SAR personnel must be provided with appropriate protective equipment and harnesses.

Control 13.3: Helicopter Cabin – Sea Tray

Ensuring there is protection of the aircraft from corrosive fluids during hoisting and SAR operations.

Aircraft to engage in wet hoist operations or potential major trauma recoveries must have a cabin floor sea-tray to protect the aircraft from the corrosive effects of fluids.

Control 13.4: Securing and Weight and Balance of Role Equipment

Ensuring the role equipment is secured appropriately in the aircraft and accounted for on the weight and balance calculations.

The aircraft operator must have a procedure and the means for securing portable role equipment aboard the aircraft. Role equipment must be located so that it does not obstruct emergency exits or push-out windows that occupants need to rely upon based on the cabin configuration.

The aircraft operator must ensure that the weight and balance calculations accurately account for role equipment.

Control 13.5: Certification of Role Equipment

Ensuring the correct classification of role equipment and the certification of the required items before being utilized in operations.

The aircraft operator must have appropriate design and production documentation for all role equipment. The aircraft operator must be able to clearly differentiate between certified aircraft equipment and carry-on items and have procedures that cover both types of equipment.

Control 13.6: Maintenance of Role Equipment

Ensuring all role equipment is maintained regularly and to the required standards.

Role equipment that must be certified as aircraft equipment must be placed on the aircraft Maintenance Program (or an equivalent equipment program). Carry-on equipment must also have a defined inspection schedule. Maintenance of all role-equipment should be conducted in accordance with manufacturer's instructions.

Control 13.7: Droppable Stores

Ensuring all articles that are dropped from the aircraft are fit for purpose and are accompanied by operating procedures to avoid damage to the aircraft.

All droppable liferafts and survival packs carried must be certified for that purpose, accompanied by Flight Manual instructions and be demonstrated to drop clear of the aircraft without a risk of damage to the aircraft.

Control 13.8: Provision of Medical Oxygen

Ensuring that medical oxygen and the cylinders carried aboard the aircraft are tested and serviced in accordance with relevant regulations.

The aircraft operator must have a procedure that ensures any oxygen cylinders are filled to manufacturer specifications. Portable oxygen cylinders must undergo regular hydrostatic testing in accordance with manufacturer specifications.

Control 13.9: Bubble Windows

Ensuring the aircraft deployed on SAR operations are suitably equipped for observers.

All SAR helicopters should be fitted with at least one bubble window on each side of the cabin to aid visual search.

Accident Threat 14.0: Control and Communications

Aircraft are equipped with the necessary communications capability and SAR mission coordination is effective

Accident Threat	Accident Prevention Goals (Controls)	
Control and Communications	SAR Aircraft – Communication/Location Transport Hoist – Communication/Location	Medevac/SAR Crew Communications SAR Call Out/Liaison/ Communication

Control 14.1: SAR Aircraft – Communication/ Location

Ensuring that suitable SAR communications and search equipment is fitted to the aircraft prior to operations commencing.

SAR aircraft must have:

- The capability to home on 121.5MHz signals;
- The ability to receive 406MHz transmitted position data;
- A marine band VHF radio; and
- A marine Automatic Identification System (AIS) transponder/receiver.

Control 14.2: Transport Hoist – Communication/ Location

Ensuring that suitable Transport Hoisting and search equipment is fitted to the aircraft prior to operations commencing.

Aircraft intended to conduct Transport Hoisting must have:

- A marine band VHF radio; and
- A marine AIS transponder/receiver.

Control 14.3: Medevac/SAR Crew Communications

Ensuring that suitable crew communications equipment is fitted to the aircraft prior to operations commencing.

The aircraft operator must have the capability to allow communications between the hoist, medevac and/or SAR personnel and the flight crew. This may include headsets in the cabin and radio communication with winchman.

Control 14.4: SAR Call Out/Liaison/Communication

Ensuring there are suitable mission coordination, SAR call-out and capability report communications policies and protocols.

The aircraft operator and the company must have agreed procedures for a SAR call out (including the assessment of any third party request for assistance) and agreed response times. Where non-dedicated SAR aircraft are used, the response times must consider a realistic time to re-role the aircraft and also the time to recall the aircraft from any other duties.

The aircraft operator must have procedures to declare aircraft unavailable or declare an extended response time when for any reason they cannot safely conduct a SAR mission to the agreed response time, if called, or to declare a partial capability (e.g. when daytime only SAR can be performed).

There must be appropriate liaison in place with any local Rescue Coordination Center with communication from the SAR base and from the SAR aircraft, both to aid search effectiveness and to ensure all SAR assets are aware of other assets in the area.

Courtesy: Bristow

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RISK STANDARD

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