FLIGHT SAFETY FOUNDATION
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Basic Aviation Risk Standard
Offshore Helicopter Operations
Safety Performance Requirements
Implementation Guidelines

Version 3, December 2016

"The identification and mitigation of risk is a clear and direct investment in operational safety, in the lives of our employees, and in the successful future of our companies"

Jon Beatty, President and CEO, Flight Safety Foundation

BARS OFFSHORE SAFETY PERFORMANCE REQUIREMENTS IMPLEMENTATION GUIDELINES

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Note other references are provided as additional sources of background information and to aid cross-reference to other guidance sources. With the exception of the referenced regulations, they are not intended to provide alternative means of compliance or create additional requirements.

Introduction

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

The Offshore Helicopter Operations Standard and Implementation Guidelines are 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 2.

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 aircraft 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

The Offshore Helicopter Operations 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 the Standard.

Variations

Any variation to the 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 1.

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 the Offshore Helicopter Operations 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 case 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 the Offshore Helicopter Operations Standard and Implementation Guidelines are listed in Appendix 3.

Figure 1: BARS Process.

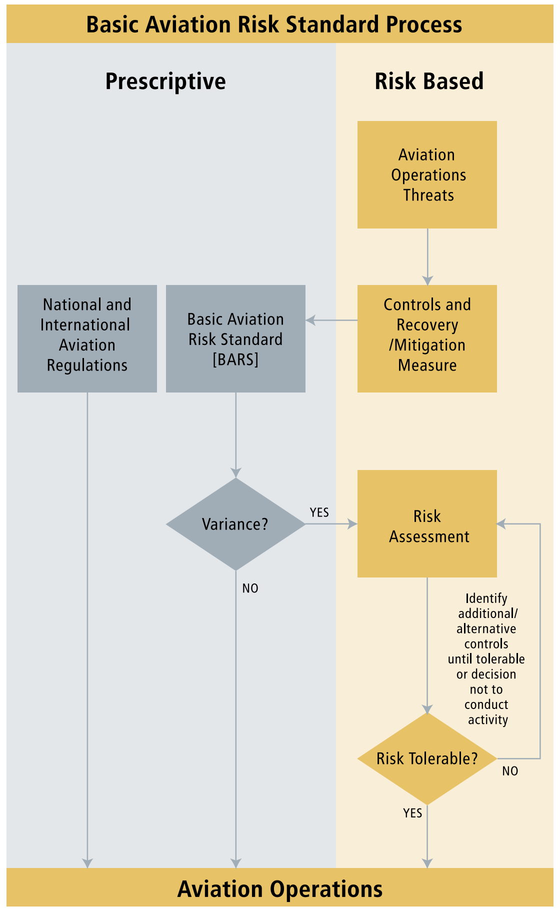

Figure 2: BARS Bow Tie Risk Model – Schematic of Offshore Safety Performance Requirements

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			Aircraft Accident	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	

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1.0: Common Enablers

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

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.

All organizations have a ‘culture’. In this context the term safety culture is used to represent the collective values, beliefs expectations, commitments and ultimately the behavioral norms of members of the organization, in relation to safety. The resulting behavior is particularly important because it provides observable evidence and influences the behavior of others.

Professor James Reason described a safety culture as one that:

- Supports open reporting;
- Is a just culture where it is clear what behavior is acceptable or not;
- Is flexible, adapting to changing threats; and
- Supports learning (and by extension improvement).

In his report on the loss of a military aircraft, Charles Haddon-Cave QC suggested adding a fifth facet that of a questioning culture. Other researchers have suggested ‘mindfulness’ of hazards or ‘chronic unease’ as other considerations.

Here safety leadership is used to represent the actions that motivate and influence the behavior of others (rather than indicating hierarchal status). Hence safety leadership is seen as an important method of influencing culture.

Safety leadership can be exhibited at all levels in the organization, but it is the safety leadership of middle and senior management that is most critical when assessing an organization. Having a stated corporate safety vision or policy that encompasses safety culture is necessary, the cultural reality may still have to mature to reach that vision. How the company is striving to enhance its culture is critical.

Auditors should take care not to draw excessive conclusions from isolated individual behavior or superficial secondary indicators of behavior. Culture is a collective characteristic and so it is important to recognize what is typical, not what is atypical. Equal care should be taken not to confuse signs of safety management activity with leadership or culture. While a well-organized SMS may indicate an effective safety culture a well structure safety process does not guarantee full engagement. Similarly, a desired culture is not the same as the actual culture.

Findings made in this area should relate to constructive and achievable near-term objectives. Care should be taken by auditors to ensure that SMS process matters are dealt with under Enabler 1.2. Enabler 1.1 is an overarching Enabler for 1.2 and 1.3.

evidence

Interview of key personnel and observation of operations.

Consider how the organization set outs behavioral and cultural expectations. Are those expectations clearly communicated, widely understood, accepted and respected?

Consider how the management engages with the workforce. Do they communicate solely by e-mail, memo and notice or do they also engage face to face in meetings and management visits? Are safety messages clear? In large organizations do senior managers use video messages to provide a more human face to their communication? Are there opportunities for two way communication? Can management show they listen? Do they display passion for safety or is it ‘just another’ issue? Are employees regularly surveyed for their opinions on safety? If so, how is that feedback used?

Consider how the organization develops safety leadership skills in key personnel. Are senior managers role models for safety leadership? Consider how the organization rewards safety leadership, participation in safety activities and other safety contributions. Are employees empowered to intervene on operational safety matters regardless of their position in the organization?

Consider how strongly the organization cares about safety. Is there pride to deliver safe operations?

Other References:

Managing the Risks of Organizational Accidents, James Reason (Ashgate) 1997

Beyond SMS, AeroSafety World, May 2008

Nimrod Review, Charles Haddon-Cave QC (HMSO) 2009

ICAO Safety Management Manual

Courtesy: Aerossurance

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.

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.

In this context, SMS includes the management of quality and regulatory compliance, however these may be defined in separate procedures and under separate departmental management.

The guidance material referenced elaborates on the detail of the structure and content of an SMS. The various guidance may help create the basis of an SMS but are not the only means of compliance or the ultimate 'best practice'.

Auditors should take care to assess the SMS effectiveness rather than against any pre-conceived 'ideal' and not limit innovation or constrain the optimization or continuous improvement of the SMS. Auditors should take care not to focus on superficial aspects of the SMS Manual or procedures.

Care should be taken by auditors to ensure that safety leadership and safety culture matters are dealt with under Enabler 1.1 (except when they exclusively relate to the documentation of supporting activities or policy) and Enabler 1.3 when they relate to information sharing. However, Enabler 1.1 is an overarching Enabler for 1.2 and 1.3.

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.

Flight Data Monitoring (FDM) should be an important component of an aircraft operator's SMS used to monitor and analyze the safety and quality of flight operations.

Baseline flight data parameters are established following an initial data gathering exercise and variations from the baseline are identified through flight data monitoring computer analysis program. Examples of FDM use include: determination of whether an unstable approach was an isolated event or symptomatic of a wider problem due to environmental influences, a weakness in ATC procedures or improper flight management.

FDM is an effective tool for identifying possible systemic issues (e.g. procedures, training, specific heliports/helidecks, etc.) or improper techniques. Of particular significance is the detection of adverse trends that require revision of the aircraft operator's training or procedures. An effective program will encourage consistent adherence to procedures and their continuous improvement while deterring any inappropriate techniques.

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.

LOSA uses trained independent observers to collect data on routine flights, on a de-identified, non-punitive basis, of the flight crew response to threats and errors. LOSA complements FDM but also provides context and insight into the effectiveness of training and procedures and the strategies that crews employ to routinely ensure success that would not otherwise be evident from FDM alone. It also provides an independent means to verify the effectiveness of CRM training and enable the continuous improvement of CRM.

The LOSA program need not involve observations of the contracted operation if an appropriate sample is taken of comparable operations (e.g. offshore operations with similar aircraft types, flying to similar procedures, in similar environments). The LOSA observations may be conducted periodically in observation campaigns, but a full observation cycle should be conducted at least every three years.

The company may need to free space for the observer on routine flights. It may also be necessary to modify the aircraft temporarily to reverse a rearward facing passenger seat to give the necessary visibility (where a suitable modification is certified).

FDM and LOSA observations can be analyzed collectively for added insight.

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.

MOP uses trained independent observers to collect data during routine maintenance, on a de-identified, non-punitive basis, of the response of maintenance personnel to threats and errors. MOP complements audits and supervisory activities but provides context and insight into organizational factors, the effectiveness of training and procedures and the strategies that personnel use to routinely ensure success that would not otherwise be evident.

MOP need not involve observations of the contracted operation if an appropriate sample is taken of comparable operations (e.g. offshore operations with similar aircraft types, maintained to similar procedures, in similar environments). The MOP observations may be conducted periodically in observation campaigns, but a full observation cycle should be conducted at least every three years.

evidence

Procedures.

Interview of key personnel.

Observation of operations.

Records.

Other References:

ICAO Annex 19

ICAO Safety Management Manual

Flight Safety Digest Volume 24 No 11 – 12, Nov – Dec 2005

Flight Safety Foundation Operational Risk Assessment Tool

International Helicopter Safety Team – SMS Toolkit – 2nd Edition Sept 2009

European Helicopter Safety Team – Safety Management Toolkit for Complex Operators

Managing the Risks of Organizational Accidents, James Reason (Ashgate) 1997

Helicopter FDM Industry Best Practice document (www.hfdm.org)

UK CAA CAP 739 Flight Data Monitoring

Flight Safety Digest Volume 24 No 2, Nov – Feb 2005

ICAO Doc 9803 – Line Operations Safety Audit

Mining Maintenance Data, AeroSafety World, June 2013

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.

Typical industry safety bodies that organizations could participate in include (but are not limited to) local flight safety committees, industry associations or professional bodies, regulatory rule making teams, HeliOffshore and the Flight Safety Foundation. While there are practical limits to how much any organization (or local subsidiary) can participate in such groups, it is expected that the organization can articulate which groups they support, how and why.

The organizations are expected to be able to demonstrate that they meet mandatory and contracted reporting requirements and show that, subject to local privacy and confidentiality requirements, they are voluntarily sharing information (both to help raise awareness across the industry but also to encourage others to share information).

There are limits to how many outside reports an organization, especially a small one, can study. It is expected an organization will be able to demonstrate they are aware of the majority of the most recent and relevant accidents and serious incidents involving the types they use or their area of operation that have been documented in the public domain. It is expected they have analyzed the most significant to identify any opportunities for improvement.

Care should be taken by auditors to ensure that SMS process matters are dealt with under Enabler 1.2. Enabler 1.1 is an overarching Enablers for 1.2 and 1.3.

evidence

Meeting minutes, membership certificates and other records.

Submitted occurrence reports.

Records.

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.

Aircraft operators must have defined selection criteria and procedures for all flight crew appointments, including full-time, part-time and casual crew. These should include minimum licensing and flying experience criteria and consider the physical and psychological aptitude to be compatible with the intended operations.

The aircraft operator should ensure crew meet all applicable requirements of the aircraft operator's training and checking program, and have been certified by a Check Pilot as being competent to act as an operating crew member. Such requirements must be applied to flight crew likely to be assigned to a BARS Member Organization flight regardless of their employment basis (e.g. full-time, part-time or casual).

Where the applicable regulatory authority has provided the aircraft operator with delegated authority to conduct check and training, the aircraft operator must ensure that selection and assessment of personnel demonstrates a consistent application of standards, ethics and objectiveness.

The aircraft operator's check and training captains should:

- Receive initial and periodic training evaluations;
- Be approved by the responsible regulatory authority; and
- Follow approved check and training criteria.

Where possible the crew providing the training should be independent (different) of those conducting the checking of the pilots. The aircraft operator's flight crew ground training program should cover all the aspects of normal operations and include:

- Altitude and terrain awareness, including items highlighted in the FSF ALAR Briefing Note 3.2 – Altitude Deviations and Briefing Note 5.2 – Terrain;
- An understanding of Performance Class 1, Class 2, Class 2 Enhanced and Class 3 performance with Category A and B certified helicopters, demonstrated through their knowledge of flyway performance for onshore operations and relevant profiles for offshore operations;
- Helicopter performance, including the requirements of the responsible regulatory authority, Original Equipment Manufacturer (OEM) and the aircraft operator's Standard Operating Procedures (SOPs);
- All instrument approaches used by the aircraft operator, including instrument approach aids and procedures that are in use in the aircraft operator's area of operation; and
- English Language Proficiency for all crew members.

Aircraft operators should have a system that ensures all crew members assigned to participating FSF BARS Member Organization flights have a current licence (where applicable) and meet both the minimum requirements defined by the responsible regulatory authority and those specified in Appendix 1 of the FSF BAR Standard for Offshore Safety Performance Requirements.

The rationale behind minimum recency requirements rests largely on assuring skills are maintained to the required standard. Variances to recency skill requirements may be considered by the respective contracting company when simulator training can be demonstrated as an effective alternative.

Aircraft operators should have a system that ensures all crew members assigned to participating BARS Member Organization flights meet the minimum recency requirements of either the BAR Standard or the responsible regulatory authority (whichever is the more restrictive).

Aircraft operators should have a records management system for recording and monitoring all relevant crew recency parameters including, but not limited to:

- Day and night takeoffs and landings;
- Flight time;
- Instrument flight time;
- Instrument approaches;
- Requirements of the aircraft operators training and checking program; and
- SAR/Hoisting recency (if applicable).

The use of simulators or Flight Training Devices is encouraged. If the aircraft operator utilizes flight simulators or Flight Training Devices in its training and checking program, it should ensure that any such device is configured to reflect the applicable aircraft type(s) and has been approved by the responsible regulatory authority.

evidence

Records of crew qualifications, complete with copies of licences (where applicable) and summaries of experience and type ratings.

A mechanism to ensure that crew are qualified and experienced to meet the task requirements when assigned to flights.

Documented minimum experience and selection requirements for all crew positions that reflect both the minimum standard for the roles as defined in the BAR Standard and the requirements of the responsible regulatory authority. Where the BAR Standard is not used for all operations, there should be a statement indicating that crew who do not meet the BARS requirements are excluded from BARS operations until the minimum qualification and experience requirements are met.

Crew files and rostering records should show that the stated BARS requirements have been met or that the individual is excluded from BARS operations until meeting the minimum qualification and experience requirements.

Check and training procedures that include the syllabuses and procedures for initial training and approval and the processes for conducting periodic training, evaluation and ongoing standardization of check and training personnel, supported by appropriate training records.

There should be a system for tracking recency. Manual, paper-based systems are acceptable however computer programs that more accurately track the varying limits are the preferred option. Associated records should demonstrate crews are maintaining the required recency and that the rostering system forecasts upcoming check and training requirements in suitable time prior to expiry. Where the BAR Standard is not used for all operations, a statement must be included indicating that crew who do not meet BARS recency requirements are excluded from BARS operations until such time as these requirements are met.

Where the aircraft operator's check and training program utilizes flight simulators or flight training devices, the aircraft operator's document system should contain procedures for their use. These should follow established criteria and address the use of simulators in the conduct of initial and recurrent check and training. Pilot training records should confirm that these requirements have been applied. The Operator should be able to demonstrate the regulatory approval of the flight simulator or flight training device.

Other References:

Flight Safety Foundation Offshore Safety Performance Requirements Flight Crew Competency Based Training Framework

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).

The aircraft operator must ensure that all maintenance personnel (employee and contractor) meet the minimum qualification and experience requirements prescribed by the responsible regulatory authority and the BAR Standard. This also applied to continuing airworthiness management personnel.

There should be procedures on the selection, minimum qualification and training requirements and internal authorization process for all key roles (including certifying staff).

There should be procedures for managing initial, indoctrination and continuation/refresher training, course syllabuses and courseware for internally delivered training and an assessment process for determining the suitability of external training.

There should be a process for competence assessment.

evidence

Procedures.

Personnel records.

Training syllabuses and courseware (with accompanying regulatory approval as applicable).

Review of selection process, quality assurance and other oversight external training providers by the aircraft operator.

Other References:

Health and Usage Monitoring Systems: HeliOffshore Best Practice Guide: In particular the sections on responsibilities and training

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.

Where multi-crew operations are conducted (see Enabler 4.3 and Appendix 4) the clear identification and description of individual roles is important to ensure acceptable crew cooperation, awareness and challenge and response protocols. The safety enhancement of utilizing multi-crew operations will only be fully realized if all crew members meet an established operational standard and perform their duties in a predictable and standardized manner.

Aircraft operators who mostly fly single-pilot operations must ensure that multi-crew procedures are understood and applied when operating an aircraft normally certified for single-pilot operations but using a two-pilot crew.

CRM focuses upon the management of the resources and skill-sets provided by all crew members to enhance safety through goal setting, teamwork, awareness and both proactive and reactive feedback.

The skills promoted by CRM training provide a significant defense against threats to safety that routinely present within the aviation system and help defend against human error and its consequences. Training the crew in threat and error management reinforces that threats and errors are a part of everyday aviation operations that must be managed to achieve safe outcomes.

Research indicates there are links between CRM and TEM making it acceptable for crew to successfully complete either course at regular intervals. Where the aircraft operator flies aircraft that include cabin/SAR crew, these staff should be included in joint CRM training courses and associated exercises.

While many of the concepts covered and focused on in CRM will apply to single-pilot operations, they are most beneficial to personnel involved in multi-crew operations. An ADM course is a recommended alternative for pilots who are engaged solely in single-pilot operations. ADM will encourage pilots to use a systematic decision making process to consistently determine the best course of action in response to a given set of circumstances.

evidence

Procedures.

Syllabus of courses.

Personnel records.

Other References:

UK CAA Paper 2013/02 Monitoring Matters: Guidance on the Development of Pilot Monitoring Skills

Flight Safety Foundation A Practical Guide for Improving Flight Path Monitoring

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.

Offshore helicopter operations may result in-flight crew conducting tours of duty that are rotational in nature and extended in duration. In such circumstances, any flying undertaken during the break time away from the touring location should be recorded and included in the aircraft operator's records.

Details of the aircraft operator's fatigue management program should be published in the Operations Manual and be either specifically approved by the responsible regulatory authority, or be in compliance with that authority's fatigue management regulations. The program should cover daily, weekly, monthly and annual flight time limits.

The aircraft operator should include details in their Operations Manual of the system to be used for recording and tracking flight and duty times as well as rest periods. While manual, paper based systems are acceptable, computer programs that comprehensively track the varying limits and predict exceedances are the preferred option.

Flight and duty time records should confirm compliance with all requirements of the flight time limits that are applicable the aircraft operator's flight time management program. The flight and duty time records that are maintained should be consistent with information provided in other documents such as aircraft flight records.

Review of the associated organizational expositions, manuals and procedures.

Examination of rosters, personnel records (including timesheets where applicable) and risk assessments and approvals of variations.

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.

The safety of any aviation system is dependent upon all participants performing reliably, effectively and efficiently. As aircraft maintenance activities are routinely undertaken by technical personnel on a shift work system, it is important that these shifts are managed by a fatigue management program. This program should ensure that fatigue occurring during a shift or accumulated over a period of time due to the pattern of shifts worked and other tasks, does not contribute to a maintenance error affecting the safety.

The aircraft operator and any maintenance sub-contractors should have fatigue management policies and procedures for all maintenance personnel that meet the following minimum requirements:

- Meet the standards required by the responsible regulatory authority;
- Limit rostered shifts to 12 hours;
- Provide a minimum of 10 hours rest between shifts;
- Include regular rest days (typically at least one day off in any seven calendar days);
- Involve the scheduling of critical tasks so they do not occur during circadian lows (e.g. night maintenance); and
- Require documented risk assessment and recorded managerial approval for variations from the defined criteria (for example greater than 12 hours of duty).

Review of the associated organizational expositions, manuals and procedures.

Examination of rosters, personnel records (including timesheets where applicable) and risk assessments and approvals of variations.

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.

Aircraft operators should have a documented Drug and Alcohol Policy/Procedures covering the use and misuse of alcohol, narcotics and medicines and encourage confidential self-reporting by personnel. These should clearly articulate requirements for safety critical staff, access to counselling/employee assistance, when, how and by whom sampling is conducted and the actions required in the event of a positive test. Specific local legal requirements and limitations should be addressed.
Guidance regarding the effects of readily available medications and drugs should be available to safety critical staff.

Documented policy and procedures supported by appropriate records of their application.

Other References:

UK CAA Paper 2002/06 Work Hours of Aircraft Maintenance Personnel

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.

Aircraft operators should have a documented Flight Crew Health Policy/Procedures covering physical and mental conditions that would affect flight safety and encourage confidential self-reporting by personnel. These should clearly articulate requirements for flight crew, treatment considerations, access to counselling/employee assistance and loss of licence insurance. Specific local legal requirements and limitations should be addressed.

evidence

Documented policy and procedures supported by appropriate records of their application.

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.

Over time, the emphasis on aircraft certification standards has increased. Initially focused on aspects such as structural strength and handling qualities, other issues have been given greater importance and emphasis in more recent certification requirements. Enhancements have included safety assessment of complex/critical systems, requirements to minimize the probability of catastrophic and hazardous failures of rotors and rotor drive systems, enhancing the control of critical parts and improving protection against lightning strikes. Additionally crashworthiness and survivability enhancements have ensured:

- Aircraft occupants are provided protection from the crash impact;
- Appropriate flotation and sea survival features are available;
- The possibility and severity of a potential post-impact fire is minimized; and
- Evacuation of occupants from the aircraft cabin can occur as quickly as possible.

Control 2.6, Error Tolerant Designs, is also relevant and should be considered during aircraft selection.

Prior to any contract renewal or tender process, the company should consult with a Competent Aviation Specialist to determine the availability and practicality of contracting aircraft types certified to the latest certification standards.

There should be an assessment of the certification basis of aircraft types offered and their in-service experience.

It should be noted that once certified, an aircraft type can continue to be produced to the same original issue status of certification standards (the 'certification basis'). This concept of 'grandfather-rights' does make it easier to introduce new requirements for future aircraft types but means that aircraft operators of aircraft types that were not recently certified (and the companies that contract them) are taking on a greater level of risk, even if the aircraft was delivered only recently. However, new aircraft types also need close attention during the early years of service as experience builds up.

When operating for a BARS Member Organization, the aircraft operator needs to ensure that aircraft are equipped in accordance with Appendix 2 of these BARS Safety Performance Requirements in addition to the operational framework set by the responsible regulatory authority and the airworthiness requirements for the aircraft type.

Ideally the aircraft operator should have a compliance check list for Appendix 2 that defines the means of compliance for each item and clearly states in what scenarios the aircraft is equipped to operate (e.g. 'long-term contract, Hostile, Night/IMC, HTRE, Transport Winching'). This should be verified by sampling aircraft technical records and/or physical inspection. All modifications should be certified and appropriate evidence available.

Guidance on individual design features and systems is given in the specific Enabler sections. See also Defence 20.1.

evidence

Aircraft records/inspection.

Aircraft Type Certificate Data Sheet (and the associated aircraft type certification basis).

Other References:

066 Norwegian Oil and Gas Recommended Guidelines for Flights to Petroleum Installations para 6.1

CS-/FAR-27 and CS-/FAR-29

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.

An aircraft operator must be in possession of a valid Air Operator Certificate (AOC) or equivalent, issued by the responsible regulatory authority that covers the aircraft type, all aspects of the type of operation and the geographic area relevant to the contract.

To hold an AOC, the aircraft operator must have demonstrated to the responsible regulatory authority that its management team, organizational structure, method of control and supervision of flight operations, training programs, ground handling and airworthiness arrangements meet the minimum standards defined by local regulations.

The requirement to sub-charter (cross-hire) generally arises when an aircraft operator is unable to fulfil a task using its aircraft and crew due to unscheduled unserviceability or a short notice request by the company, resulting in the proposed use of an alternative aircraft operator.

To ensure that all standard technical and operational requirements are being met (such as BARS requirements), the aircraft operator must have a process in place to notify the company of potential sub-charter (cross-hire) situations as soon as possible and demonstrate that the proposed operator is also appropriately approved. The alternative service being proposed should be reviewed by the company and, if acceptable, use of the alternate service provider agreed. All written agreements should specify the aircraft operators being used.

The Operations Manual may be issued in paper form and/or electronically (for example in an Electronic Flight Bag if approved by the responsible regulatory authority).

There should be means to issue temporary or urgent supplementary information in a controlled manner.

Where specialist operations, such as SAR, transport hoist or medevac, are conducted, appropriate procedures should be included. Procedures necessary to support other Controls in this Standard should be included.

evidence

The AOC (or equivalent) along with associated limitations or restrictions contained in an Operations Specification (or equivalent) and any specific written permissions (or equivalent) granted. Appropriate controlled and approved manual(s) with a process for temporary revisions or notices.

Courtesy: Aerossurance

2.0: System Failure

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

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.

Health and Usage Monitoring Systems (HUMS) and VHM systems in particular are used to provide early detection of rotor and transmission/rotor drive system component issues. They may also provide engine data but rotors and transmissions are the primary target.

CS-29.1465 is a certification requirement introduced for VHM. Earlier systems will not have been certified to that requirement hence the requirement above in relation to the Controlled Service Introduction (CSI). The purpose of a CSI is to oversee the initial service of a VHM and confirm it has appropriately matured. Currently CSIs conducted under UK CAA and EASA are acceptable.

HeliOffshore have defined best practice guidance in relation to the management and use of HUMS/VHM and also provided an implementation guide for applying that best practice. The best practice includes areas such as:

- Ground station software and data management;
- Download and primary analysis;
- Communication (internally and externally);
- Advanced anomaly detection and web portals;
- System performance;
- Responsibilities and process descriptions;
- Training; and
- Quality assurance.

While TC Holder support for a VHM is normally beneficial, it does not remove any continuing airworthiness responsibilities from the operator.

As well as being able to download and maintain a VHM, the aircraft operator should demonstrate they have the skills to assess the data, liaising with the VHM Designer and/or the TC Holder as appropriate. Where service support is sub-contracted then the third party should be examined. Enabler 1.4 and Control 2.4 are also relevant.

Procedures.

Records.

Other References:

HeliOffshore HUMS Best Practice Guide

HeliOffshore HUMS Best Practice Implementation Guide

EASA CS-29.1465

CAP 753 Helicopter Vibration Health Monitoring

Managing a Successful HUMS Operation, DSTO – Third International Conference on Health and Usage Monitoring – HUMS2003

066 Norwegian Oil and Gas Recommended Guidelines for Flights to Petroleum Installations para 7.2

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.

In order to minimize the probability of engine failures, the recording of engine usage and the assessment of the data for abnormal occurrences and adverse trends should be conducted. Such equipment should be certified for the purpose.
Control 2.4 is also relevant.

Procedures.

Records.

Other References:

EASA Air Ops CAT.POL.H.305 specifies a suitable system

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.

This requirement is to ensure that flight crew can be readily advised of any abnormalities identified by passengers that may be relevant to flight safety. It is not intended to create in-flight distractions by superfluous communication that is not critical to flight safety.

In-flight issues originating from the rear of the aircraft (for example from the baggage compartment or engine bay), such as a sudden onset of unusual noise, vibration, fluid leak, smoke or over-heating electrical odors may occur where it is noticeable to passengers before flight crew. Passengers may also experience distress or illness.

Under these circumstances, the ability to pass any safety-related information to the flight crew is required. Typically, where it is not possible to approach the cockpit (as on a large helicopter with an aisle) one option is to provide a headset connected into the crew Inter-Communication System (ICS).

The passenger headset would normally be allocated to a specific seat occupied by a suitably experienced and briefed passenger identified during the check-in process. If this is not practicable because of a lack of space, ICS access, issues with chords blocking egress or headset damage, an alternate means of communication should be considered.

Control 4.2 (External Vision and Obstacle Detection Aids) may also be relevant.

Procedures.

Physical inspection.

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.

This control covers both the management of the continuing airworthiness of the aircraft operator's fleet and the actual maintenance in relation to safety and emergency equipment. Additionally all requirements of Control 2.4 apply.

Courtesy: HeliOffshore

evidence

Review of the associated organizational expositions, manuals and procedures.

Examination of the aircraft Maintenance Program and Minimum Equipment List/Deferred Maintenance.

Examination of aircraft technical records (including Certificates, Technical Logs, Logbooks, Work Packs and configuration records) and any electronic database and its management.

Review of Deferred Defects and their rectification and the history of Rectification Interval Extensions.

Review of Maintenance Program variations and their approval.

Examination of design data for repairs and modifications conducted.

Inspection of typical aircraft.

Review of quality assurance and other oversight of maintenance organizations by the aircraft operator.

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.

The greater reliability of turbine engines over piston/reciprocating engines is well documented and results in less risk of experiencing an engine failure than when operating turbine-powered aircraft. A single-engine aircraft having experienced an engine failure will require a forced landing area within its immediate vicinity. If this occurs over hostile terrain, the safe recovery of the occupants will not be assured. However, while single-engine helicopters fall into ICAO's PC3, so do multi-engine helicopters that are not certified in Part 27/29 Category A or that have limited performance with one engine inoperative. These tend to be older, lower performance helicopters. Use of turbine powered PC3 helicopters is considered acceptable for passenger carrying operations during day visual conditions over non-hostile environments.

ICAO also make a distinction between Part 27/29 Category A multi-engine helicopters in relation to their performance margins that is particularly relevant to offshore takeoffs and landings. The difference between PC1 and PC2, is that in PC2 an engine failure during offshore takeoff and landing can potentially still result in striking the deck edge or failing to fly away.

evidence

Aircraft records.

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.

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.

If the TC Holder does not issue such guidance, the aircraft operator should demonstrate they have thoroughly reviewed all Service Bulletins, Service Letters and other similar publications to determine their effect on propulsion reliability (which includes engine, fuel, intakes, controls, etc).

These enhanced modifications and procedures should be implemented. Control 2.4 is also relevant.

evidence

Procedures.

Maintenance Program.

Records.

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 for 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.

This control covers both the management of the continuing airworthiness of the aircraft operator's fleet.

Depending on the local regulatory system and the aircraft operator's commercial choices there may be several regulatory approvals and/or sub-contractors involved in these activities.

As a minimum the aircraft operator should have audit and approval processes in place to provide assurance that maintenance standards meet minimum requirements throughout its own and any sub-contracted maintenance organization.

During the BARS audit process, and as a minimum, the aircraft operator's continuing airworthiness management organization and the primary aircraft maintenance organization(s) will be examined. It would be normal to spend at least as much time reviewing the continuing airworthiness process as actual maintenance.

See also other airworthiness related specific Controls for Accident Threat 2.0, especially Controls 2.1 to 2.5). Enabler 1.4 is also relevant.

evidence

Review of the associated organizational expositions, manuals and procedures.

Examination of the aircraft Maintenance Program and Minimum Equipment List/Deferred Maintenance.

Examination of how reliability data is gathered and assessed.

Examination of aircraft technical records (including Certificates, Technical Logs, Logbooks, Work Packs and configuration records) and any electronic database and its management.

Review of Deferred Defects and their rectification and the history of Rectification Interval Extensions.

Review of Maintenance Program variations and their approval.

Examination of aircraft maintenance scheduling.

Examination of design data for repairs and modifications conducted.

Examination of facilities, stored components, technical library and tooling.

Examination of personnel records.

Inspection of typical aircraft.

Review of quality assurance and other oversight of maintenance organizations by the aircraft operator.

Other References:

Health and Usage Monitoring Systems: HeliOffshore Best Practice Guide

HeliOffshore HUMS Best Practice Implementation Guide

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.

This control covers the management of the continuing airworthiness of the aircraft operator's fleet.

Depending on the local regulatory system and the aircraft operator's commercial choices there may be several regulatory approvals and/or sub-contractors involved in these activities.

During a BARS audit, as a minimum, the aircraft operator's continuing airworthiness management organization and the primary aircraft maintenance organization(s) will be examined.

If the less frequent base maintenance checks are contracted out, the workscope, planning and contracting for these checks, plus the associated liaison and oversight processes may be examined. Contracted out engine overhauls may be examined in a similar manner.

Other contracted component maintenance will normally only be assessed in relation to supplier selection, work orders and good inward inspection of components. Where component maintenance is done in-house, sampling should be proportionate and be focused on the more safety critical components and systems (for example engines, rotors, rotor drive systems, flying controls, safety equipment, etc).

See also other airworthiness related specific Controls for Accident Threat 2.0, especially Controls 2.4 and 2.7). Enabler 1.4 is also relevant.

evidence

Review of the associated organizational expositions, manuals and procedures.

Examination of aircraft technical records (including Certificates, Technical Logs, Logbooks, Work Packs and configuration records) and any electronic database and its management.

Review of Deferred Defects and their rectification and the history of Rectification Interval Extensions.

Examination of maintenance organization resource planning.

Examination of facilities, stored components, technical library and tooling.

Examination of personnel records.

Inspection of typical aircraft.

Review of quality assurance and other oversight of maintenance organizations by the aircraft operator.

Other References:

Health and Usage Monitoring Systems: HeliOffshore Best Practice Guide
HeliOffshore HUMS Best Practice Implementation Guide

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.

The aircraft operator should ensure that all CMTs that meet the definition above, as a minimum, are defined as such. Any item identified by the TC Holder or the responsible regulatory authority as a CMT (or an equivalent) should also be treated as such.

An Independent Inspection (also sometimes referred to as a Required Independent Inspection or Duplicate Inspection) should be conducted on all CMTs. The first of the two-person complement to inspect the task shall be the person who is to sign the Maintenance Release and may have been involved in execution of the task. The second person is the independent checker (verification) and should not have been involved in the task. Ideally they should also be qualified to sign the release but a person otherwise qualified to do Independent Inspections may be used.

Independent Inspections should be recorded. Enabler 1.4 and Control 2.4 are also relevant.

evidence

Procedures.

Records.

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.

The maintenance organization should demonstrate that the tool control procedures in place are effective at preventing tools being left on aircraft and posing a risk of causing jamming or damage in-flight.

Maintenance management must take responsibility for the oversight of any personal tools used by their staff, when such tools are allowed. Tool control can be easier if company owned tooling is exclusively used and personnel tooling is prohibited from the workplace.

A significant element of inspecting an aircraft prior to panel/compartment closure is intended to locate any foreign object that may have been missed, not just tooling.

evidence

Procedures.

Records.

Physical inspection.

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.

In this context a critical error is one that could lead to potentially Hazardous or Catastrophic consequences (as defined by CS-29). It is however good practice to address Major failures modes with the same approach.

Error tolerant designs are ones which either eliminate or minimize the risk of a human error. Ideally risk should be engineered out at the design phase (for example by a design that prevents the misorientation of a component by features that ensure only one orientation is possible).

If risk can't be eliminated, substituted or engineered out, then functional tests or equivalent that provide an unambiguous indication of error and visual/physical prompts on components (such as marking flow direction on valves) should be present. While administrative controls such as appropriate warnings in maintenance documentation and technical publications is encouraged, these are some of the weaker forms of mitigation.

The ideal opportunity to consider error tolerance is during the design process and this is best done collaboratively by users and designers, supported with appropriate human factors expertise.

Enablers 1.2, 1.3, 1.7, and Controls 2.4 and 2.5 are relevant, and in particular error tolerance should be considered during aircraft selection (Enabler 1.7).

Auditors should focus on how air operators identify and mitigate design features that have the potential to provoke errors and how that feedback is given to the Type Certificate Holder.

evidence

Procedures.

Records.

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.

The aircraft operator should have suitable procurement, stores and maintenance procedures.

Stores should adequately protect components from damage, contamination and environmental effects.

Stores components should be adequately marked, tracked and segregated.

Enabler 1.4 and Controls 2.4 and 2.5 are also relevant.

evidence

Procedures.

Records.

Physical inspection.

Courtesy: HeliOffshore

3.0: Aircraft Upset

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

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.

The flight operations procedures are to be characterized by defined speeds, climb/descent rate, vertical flight-path and configuration, as appropriate, through a series of defined ‘gates’ as necessary.

For offshore helicopter operation it may be appropriate to set these gates based on distances from the helideck rather than altitude. Irrespective of their basis the aircraft operator should have a sound justification for their selection.

The aircraft operator’s Operations Manual should further include a clear policy regarding the circumstances under which the conduct of a mandatory and no-fault go-around is to be carried out. The policy should contain a clear statement that the aircraft operator supports the Pilot-in-Command’s decision to go-around, regardless of the circumstances.

In addition to the routinely practiced single-engine go-around, the aircraft operator should ensure that go-arounds with all engines operating form part of its regular check and training regime to increase crew familiarity with the maneuver.

Aircraft operators are encouraged to develop and implement a policy for mandatory, internal reporting of occurrences involving aircraft destabilization and any go-around. Tracking of such reports, alongside FDM analysis, within the aircraft operator’s SMS will assist with the identification of possible specific risks or considerations that may exist in the conduct of approaches.

evidence

Procedures.

Records.

Other References:

Flight Safety Foundation’s ALAR Guidance

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.

Errors in situational awareness of mobile vessels or misidentifying adjacent installations can result in selecting the wrong deck to land upon or unnecessary approaches and go-arounds.

evidence

Procedures.

Records.

Observation of flight preparations.

Other References:

UK Health and Safety Executive Report OTO 2000/067 Review Of Wrong Helideck Landings, Status Lights and Signaling Lamps

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.

The aircraft Autopilot or Automatic Flight Control System (AFCS) provides assistance to the flight crew throughout the flight by relieving the Pilot Flying (PF) from routine manipulative tasks. The correct use of automated systems significantly reduces pilot workload enabling time for other flight management demands. The availability of an Autopilot greatly increases a pilot's ability to maintain situational awareness, respond to unanticipated changes (e.g. ATC instruction, weather conditions, etc.) and correctly respond to and manage an abnormal or emergency situation. A number of accidents have however involved incorrect mode selections on the Autopilot or AFCS.

A number of accidents have also cited the failure of flight crew manipulative skills when automated systems have failed or been disabled. Retention of core flying skills remains a key component in the safe operation of an aircraft and flight crew should regularly practice maintenance of these skills when in a low-threat environment to avoid automation dependency. The aircraft operator should have procedures that detail the conditions under which automation systems may be disengaged and manual flight undertaken.

The aircraft operator's Minimum Equipment List (MEL) should have clear requirements for the AFCS to be serviceable for night or IFR flights.

evidence

Procedures.

Syllabus of training.

Other References:

HeliOffshore Automation Guidance and Videos http://helioffshore.org/automationvideos/

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.

There are circumstances where it is appropriate for one member of a two-person flight crew to disembark to supervise loading, refueling or any other duties external to the helicopter. In these cases, the pilot remaining at the controls should only perform cockpit duties related to the identification of external hazards and passenger movement around the aircraft. Heads-down administrative duties such as manifesting, weight and balance calculations or customer/logistics paperwork is not to be conducted.

On single-pilot helicopters, the helicopter must be shut down if the pilot is required to leave the controls for any reason.

evidence

Procedures.

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).

Companies should note that last minute changes in routing or loads on multi-sector flights introduce distractions and potentially confusions that increase risk of wrong deck landings. Furthermore, database entry errors will be minimized when the designation used by the aircraft operator for helideck location matches that designation painted on the helideck.

evidence

Procedures.

Records.

Other References:

UK Health and Safety Executive Report OTO 2000/067 Review Of Wrong Helideck Landings, Status Lights and Signaling Lamps

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

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.

Controls 3.1 and 4.2 are also relevant.

evidence

Procedures.

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.

Class A TAWS uses inputs such as position, attitude, airspeed and glideslope, which along with internal terrain, obstacles and airport databases predict a potential conflict between the aircraft's flight path and terrain or an obstacle. Class A TAWS provides an alert to flight crew permitting them to take appropriate evasive action. Enabler 1.4 and Controls 3.1, 4.1 and 4.4 are also relevant.

evidence

Procedures.

Aircraft records/inspection.

Syllabus of courses.

Personnel records.

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.

The sensors may be in the form of cameras to display images in the cockpit, or laser/radar based detection systems and may be supplemented by mirrors. While the only practical option on smaller helicopters, mirrors would not be credible as the sole solution on larger aircraft.

The company may contractually specify a minimum solution (such as a tail mounted camera or a laser detection system), alternatively the aircraft operator should conduct a risk assessment using possible accident scenarios to determine a technically feasible and economically justifiable equipment fit. This risk assessment should be documented and made available on request.

The risk assessment should further consider the regional helideck/heliport environment (in relation both to the obstacle environment and helideck/heliport personnel performance) and specific aircraft type failure modes (including significant false warnings that may be verified by these aids). It should consider blind spots, likely aircraft maneuvers/ground activities, the types of contact and their consequence that may occur and the practical crew actions. The effectiveness of potential aids at night should be examined, although the exposure to relevant accidents during night operations should be a factor considered. Operations involving SAR close to cliffs or structures should be considered high risk operations worthy of careful attention.
Also relevant to Controls 2.1, 5.3 and 8.3.

evidence

Aircraft records/inspection.

Risk assessment.

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 offshore flight increases both the risk of Surface/Obstacle Conflict and Aircraft Upset. It also adds to the complexity of successfully locating and recovering personnel in the event of ditching.

If routine night passenger flights are conducted, the SAR plan should be risk-assessed using worse-case localized conditions and an inability of survivors to board liferafts. The risk assessment should include potential ditching at the furthest point from both onshore and offshore rescue resources.

In particular, any proposed night flights to/from bow mounted decks must be carefully considered due to the limited visual references available to the crew during hovering. Defence 20.7 is also relevant.

Procedures.

Review of risk assessments and SAR capability data.

Other References:

066 Norwegian Oil and Gas Recommended Guidelines for Flights to Petroleum Installations para 6.3.5

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.

Having two qualified pilots that function as a crew using approved SOPs reduces the risk of human error in an environment dominated by incidents attributed to human factors. Using two-pilot crews helps mitigate the risk in the following ways:

- Workload distribution: Single-pilot operations require the pilot to perform the role of pilot, navigator, radio operator, systems manager, on-board meteorologist, record keeper and passenger controller. The workload further increases when outside visual cues decrease, i.e. at night or when in IMC. The additional crew member allows for an appropriate distribution of workload permitting greater attention to flight path management;
- Error recognition and trapping: Approved SOPs that require the Pilot Monitoring to monitor the actions of the Pilot Flying with the aim of identifying any error or omission made in operation of the aircraft. A coordinated two-pilot crew should ensure that any identified error is discussed, rectified and monitored to negate any safety impacts; and
- Reduction in fatigue: With a decrease in outside visual cues at night in IMC comes an increased use of instruments to provide the necessary flight path management and situational awareness. The night or instrument flight requires an increase in concentration levels required by a pilot and a greater risk of fatigue-related errors which can be mitigated by task sharing with a second crew member.

The transfer from an instrument environment to a visual environment during landing at an offshore facility, or from visual to instrument on departure from an offshore facility is a high risk phase of flight that is a far more coordinated and safe activity when two-pilots are used.

Night or instrument conditions dramatically reduce the probability of being able to make a safe emergency landing following an engine failure, so multi-engine helicopters should be used if either night or IMC operations are to be undertaken.

Procedures.

Records.

Observation of flight preparation.

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.

The use of simulators or Flight Training Devices is encouraged and enables crews to practice normal and abnormal operations (engine and/or system malfunctions and emergencies) in conditions and situations that would present an unacceptable risk to train and practice in an aircraft. This enables flight crew members to gain greater familiarity with the application of procedures in critical or adverse situations that cannot be safely replicated in the aircraft during training.

Use of simulators for crews operating offshore at night should incorporate dedicated night operations to offshore facilities and include:

- Stabilized approaches;
- Instrument approach procedures;
- Missed approaches/go-arounds (including all-engines operating);
- Emergency procedures;
- Simulation of subtle crew incapacitation;
- Visual-to-instrument recoveries; and
- Other known flight occurrences unique to the offshore environment.

The aircraft operator should have a records management system for recording and monitoring all relevant flight crew recency parameters conducted in the simulator or Flight Training Device (see also Enabler 1.4).

Procedures.

Training syllabus.

Training records.

Simulator/FTD records.

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.

Flight crew manipulative skills need to be practiced frequently to maintain minimum levels of competence. This is particularly true for night and instrument environments where a combination of manipulative skills and situational awareness require optimum performance from the flight crew.

For offshore operations, night recency should be conducted to an offshore helideck.

Recency requirements are often achieved during normal line operations with little disruption to normal schedules. However it may be necessary for the aircraft operator to schedule either specific recency training flights or simulator exercises in order to maintain the stated requirements. The company should endeavour to provide helideck availability when requested to support training.

In extreme latitudes, where night time is limited during summer months, 'summer alleviation' to this requirement may be agreed by a Competent Aviation Specialist.

The aircraft operator should have a records management system for recording and monitoring all relevant flight crew recency parameters (see also Enabler 1.6).

evidence

Procedures.

Personnel records.

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.

Special VFR procedures are used for VFR flights cleared by air traffic control to operate within a control zone in conditions less than visual meteorological conditions, often at low altitude to maintain visual reference with the ground or water. Normally such clearances are not offered by air traffic and generally only issued on request.

The adoption of Special VFR procedures substantially increases the risks of an operation and to fly Special VFR safely, it is essential that the crew has a thorough knowledge of the airport and its surrounding environment.

The aircraft operator's Operations Manual should either detail that Special VFR clearances will not be requested or accepted, or where the aircraft operator has authorized Special VFR operations, the procedures should only be used if agreed with the company and be part of local familiarization briefings for new pilots. A risk assessment involving a Competent Aviation Specialist would normally accompany such company agreement.

evidence

Procedures.

Records of risk assessment.

Records.

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.

The requirement for two-crew coordination whereby both crew members need ready access to accurate altitude information is increased during night/IFR offshore operations. Approach information required to determine landing decision points and departure information for the profile-type flown needs precise altitude information to be clearly presented to both crew members. The aural alerting function of the radio altimeters provides an additional awareness capability and should be used as a last line of defence to prevent a Controlled Flight Into Terrain/Water (CFIT/W) accident.
Enabler 1.4, and Controls 3.1 and 4.2 are also relevant.

evidence

Procedures.

Aircraft records/inspection.

Courtesy: Bristow

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

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.

Floating vessels move around a point due to wind and wave motion. The subsequent movement of the vessel's helideck presents greater challenges to flight crew, particularly during the landing phase. To provide assurance that safe operating limitations are being maintained, accurate deck movement information must be passed to the flight crew.

When the helideck is located away from the center of rotation of the vessel (e.g. bow or stern mounted helidecks), the movement is accentuated. The movement of the helideck may exceed the safe landing limitations for the helicopter. It is therefore essential that the motion sensors are located as close to the helideck as practicable, or have undergone software-based processing to provide accurate helideck pitch, roll and heave (PRH) information.

Communication of the helideck motion must be provided to the flight crew in a standardized format acceptable to the aircraft operator. If a vessel changes course, PRH limits are exceeded or any another event likely to influence landing or on-deck operations occurs (such as loss of control of dynamic positioning), the information must be able to be immediately communicated to the flight crew.

All motion detecting equipment should be calibrated and certificates of calibration should be available and verified as part of helideck inspections.

The aircraft operator and the vessel must agree on a procedure to be followed by vessel personnel around a helicopter that is required to make an emergency departure due to deteriorating conditions.

Small vessels may have rapid changes to PRH and therefore only those pilots who have been formally qualified to do so should undertake operations to them. Operations to small vessels should only be conducted if the helicopter has out-of-ground-effect (OGE) power available.

Passengers should not be carried during small vessel operations unless they are deplaning or emplaning at that vessel.

evidence

Procedures.

Records.

Equipment inspection.

Observation of helideck preparation.

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.

This control is also relevant to elements of Accident Threats 4, 6, 8 and 9.

There should be detailed procedures for heliport (including helideck) management as part of a Safety Management System (see Enabler 1.2 for SMS).

These should include:

- Inspections of aircraft movement areas and checking surface conditions for the possible presence of foreign objects;
- Inspections of markings, lighting, wind direction indicators and ground signals;
- Monitoring obstacles that may infringe the takeoff, approach and transitional surfaces;
- Inspections to determine if any birds or animals are near the aircraft movement areas and, where necessary, implementation of a wildlife management program;
- Inspections of measures, such as perimeter fencing, that are in place to control the inadvertent entry of persons or animals into the movement area; and
- Management of maintenance and other engineering work to ensure the safety of aircraft operations and aerodrome personnel.

Procedures should include conducting daily heliport/helideck condition inspections prior to the first aircraft movement, after significant wind or rain storms, or when specifically requested by the aircraft operator are required. The use of checklists is encouraged and a written record of the completed condition inspection and any defects discovered is required. The process to rectify any deficiencies should also be documented.

The aircraft operator should be promptly advised of possible or known changes to heliport/helideck conditions which may present a hazard to aircraft operations.

evidence

Procedures.

Personnel records.

Interview.

Inspection reports, corrective action data and inspection certificates.

Observation of heliport/helideck operation.

Other References:

UK CAA CAP 437 Offshore Helicopter Landing Areas

Oil and Gas UK Guidelines for the Management of Aviation Operations

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).

Any personnel designated as an HLA must also receive formalized training from an approved HLO and where possible participate in periodic emergency drills.

In addition to standard Personal Protective Equipment (PPE), all helideck personnel must wear and be identified by a high visibility vest (or equivalent).

Prior to initial operations to a helideck, qualified personnel from the aircraft operator must brief relevant offshore personnel in the safe operating practices and procedures for the helicopter type operated.

When conducting operations to Normally Unattended Installations (NUIs) where the helideck will be unmanned during the approach and landing or left unmanned on departure, both the aircraft operator and the company must have procedures applicable to such operations.

The HLO is responsible for a wide variety of tasks related to helicopter operations, each of which relate to ensuring the overall safety of helicopter operations and all personnel involved.

Training should include all aviation duties including refueling (where that is performed) and post-accident duties.

Type specific training on the contracted helicopters should include consideration of unique aircraft hazards, doors and exits, seating layout, baggage bay loading, refueling (if applicable) and emergency engine shutoff procedures.

A process should be in place to ensure that newly trained HLOs initially work under the supervision of an experienced HLO to verify their competence before being released to unsupervised duties.

Where heli-admin personnel are used, they should also be trained for the duties they perform.

evidence

Procedures.

Personnel records.

Observation of helideck operations.

Other References:

OPITO Training Standards

UK CAA CAP 437 Offshore Helicopter Landing Areas

Oil and Gas UK Guidelines for the Management of Aviation Operations

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.

The HLO should confirm by radio when the helicopter is in sight before the final confirmation that the deck is clear is given.

evidence

Procedures.

Observation of landings.

Other References:

UK Health and Safety Executive Report OTO 2000/067 Review Of Wrong Helideck Landings, Status Lights and Signaling Lamps

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.

evidence

Procedures.

Means to mark deck.

Other References:

UK CAA CAP 437 Offshore Helicopter Landing Areas

Oil and Gas UK Guidelines for the Management of Aviation Operations

UK Health and Safety Executive Report OTO 2000/067 Review Of Wrong Helideck Landings, Status Lights and Signaling Lamps

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).

A process should be in place for the owner/operator of the heliport/helideck to verify and maintain the facility in an acceptable condition. This process should address the continued compliance of the facilities, local operating procedures and the personnel manning heliport/helideck, with an effective process for addressing any findings made. This process should include audits/inspections in addition to any certification inspections by external bodies.

Engineering drawings.

Physical inspection.

Inspection reports, corrective action data and inspection certificates.

Other References:

ICAO Annex 14, Volume II ('Heliports')

UK CAA CAP 437 'Offshore Helicopter Landing Areas'

Oil and Gas UK Guidelines for the Management of Aviation Operations

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).***

Conducting a landing site assessment prior to commencing operations to a new location provides a necessary level of assurance for the conduct of safe operations. This assessment can be a desktop review using available and documented information, or for more regular operations, an actual site visit to review facilities, infrastructure and the surrounding environment. Completion of such an assessment will allow the aircraft operator to determine the presence of any hazards to be risk-assessed and potentially mitigated through their Safety Management System.

New-build and reworked installations and vessels will often have helideck lighting assessed during acceptance testing in dry-dock or at a construction site. This does not always allow confirmation of the acceptability of lighting in normal operating conditions with other installation lighting. A non-revenue flight conducted by appropriately experienced flight crew will validate the effectiveness of an installation's helideck night lighting once the platform has moved to its operational location. It will also detect glare from unshielded lights during the approach, poor installation/vessel identification poorly illuminated windsocks which may provide little or no information prior to landing, and rotating beacons which may provide a distraction to flight crew.

The purpose of this control is to avoid unacceptable and distracting night illumination of a platform being encountered for the first time during an operational or medical evacuation flight.

Procedures for site assessments and night validation on new build or reworked platforms.

Records of site assessments and night validation.

Other References:

UK CAA CAP 437 Offshore Helicopter Landing Areas

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.

The ICS Guide to Helicopter/Ship Operations provides guidance for ship to helicopter operations and is relevant to vessel owners/operators, aircraft operators and companies.

Companies should reference the ICS Guide in contract technical requirements and at minimum understand what gaps (if any) exist in the ship-to-helicopter interface as it pertains to the ICS Guide. This most likely will be facilitated by a risk assessment involving representatives from the vessel, aircraft operator and company, involving a Competent Aviation Specialist.

The aircraft operator and vessel must conduct a briefing before passenger operations begin, to align operating practices for all normal and emergency procedures. This should typically include:

(1) The process for vessel to request normal, cargo and medevac flights;
(2) Limitations of the aircraft operator;
(3) Limitations on night operations, winching, external loads;
(4) Any other limitations imposed by the company;
(5) Passenger and cargo manifesting;
(6) Dangerous Goods;
(7) Radio procedures;
(8) Clearances for helicopter to land and depart;
(9) On deck clearances for the Helideck Landing Officer (HLO);
(10) Helideck net (if applicable);
(11) Crane procedures (if applicable);
(12) Pitch, roll and heave limits;
(13) Maximum acceptable wind conditions;
(14) Weather and helideck status information to be passed to pilots;
(15) Method of classifying wind information, whether relative, magnetic or true;
(16) Passenger control on deck;
(17) Baggage and cargo management;
(18) Clear deck policy;
(19) Drug and alcohol and no-smoking policies for passengers;
(20) HUET requirements;

(21) Allowable baggage limits;
(22) Prohibition on carry-on items;
(23) Emergency procedures with helicopter on deck;
(24) Firefighting support during helicopter operation;
(25) Medevac procedures;
(26) Provision of safety briefing on-board the vessel for departing passengers;
(27) Management of immersion suits and life jackets;
(28) Vessel SAR capability to assist in aircraft emergencies; and
(29) Medevac response.

evidence

Procedures.

Records of any past gap analysis.

Records of any past risk assessments.

Other References:

International Chamber of Shipping (ICS) Guide to Helicopter/Ship Operations

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.

If the potential for multiple helicopter operations exists, a procedure for a second helicopter landing on a helideck must be included in the aircraft operator's Standard Operating Procedures or Operations Manual. Such operations must be limited to daylight only.

This practice should only be permissible when appropriate risk assessments have been conducted. The risk assessment (and any procedures) should include the following considerations:

- Operational procedures;
- Helideck and second helicopter size (minimum separation distances on landing);
- Positioning of the parked aircraft in relation to area of availability, wind direction and therefore approach direction of the second aircraft;
- Tie down of the parked aircraft's main rotor;
- Tie down of the parked aircraft to the deck and;
- Helideck load bearing capability (static and dynamic loads).

If the purpose is simply to transfer maintenance personnel after a helicopter becomes unserviceable on a helideck, alternative means of transfer, such as transport hoisting should be considered where practical.

The aircraft operator should also confirm that the platform OIM authorizes the operation and that prior consultation between the OIM, HLO and the aircraft operator will occur.

evidence

Procedures.

Records of past assessments (where conducted).

Other References:

UK CAA CAP 437 'Offshore Helicopter Landing Areas'

Oil and Gas UK Guidelines for the Management of Aviation Operations

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.

ICAO Annex 14 Volume II should be the main reference for onshore heliports and UK CAA CAP 437 for offshore helidecks, supplemented by any more stringent local regulations. This control generally is not influenced by the aircraft operator, and is for company consideration. Notwithstanding, it is imperative that company aviation specialist advice be sought well before critical design review completion to ensure all relevant aviation considerations have been made.

evidence

Design Standards.

Engineering drawings.

Physical inspection.

Other References:

ICAO Annex 14, Volume II (Heliports)

UK CAA CAP 437 Offshore Helicopter Landing Areas

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.

Care should also be taken to avoid inconsistencies between installation/vessel names and radio call signs. Where the regulatory environment requires the Block name to be painted on the helideck, additional painting of the platform name should also be considered. Regardless, it is essential that the same naming convention is used by the aircraft operator for data input into the aircraft GPS or Flight Management System (FMS) and destination installation/vessel markings.

Installation/vessel markings should be cleaned and maintained such that they are easily discernible under all lighting conditions at the Landing Decision Point.

Degraded markings should be reported by flight crew and reported through the helideck operator's SMS.

evidence

Engineering drawings.

Approach plates.

Installation/Vessel inspection.

Other References:

UK CAA CAP 437 Offshore Helicopter Landing Areas

Oil and Gas UK Guidelines for the Management of Aviation Operations

UK Health and Safety Executive Report OTO 2000/067 Review Of Wrong Helideck Landings, Status Lights and Signaling Lamps

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.

Facilities and features provided in terminal areas and their associated procedures should ensure the efficiency of passenger processing and maintain separation, wherever possible, between incoming and outgoing passengers. The segregation of inbound and outbound personnel is to avoid confusion, interruptions and delays during the search, briefing and boarding processes at heliports. It is accepted that on installations and vessels, with their lower throughput of passengers and space constraints may have a less optimized layout.

evidence

Engineering drawings.

Physical inspection.

Observation of heliport/helideck operation.

Other References:

Oil and Gas UK Guidelines for the Management of Aviation Operations

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.

Such areas should be located clear of the aircraft movement area and positioned to avoid the effects of aircraft prop-wash, jet blast or helicopter down-wash. Appropriate measures should be taken to protect all baggage and cargo from the effects of rain prior to loading on-board the aircraft. While this is good practice to prevent damage to the baggage and cargo, it is important that exposure to rain does not significantly increase the weight of items to be carried (see Control 8.1).

evidence

Engineering drawings.

Physical inspection.

Observation of heliport/helideck operation.

Other References:

Oil and Gas UK Guidelines for the Management of Aviation Operations

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.

Aircraft apron areas should be available at heliports to allow the loading and unloading of passengers and cargo as well as the servicing of aircraft. Apron areas must be of sufficient size to safely permit the handling of aircraft at the maximum anticipated traffic density and to accommodate the expected requirements for transient and longer term parking of aircraft.

Each part of an apron should be constructed to give a pavement load bearing capacity that is capable of sustaining the effects of loads imposed by the aircraft it is intended to serve.

Apron marking requirements will be determined primarily by the size of the aircraft being accommodated and the level of regulatory authority certification that applies. However, sufficient guidance markings should be provided to minimize the risk of an aircraft colliding with an obstacle on the ground, and to facilitate the safe and efficient movement of persons and equipment around aircraft on the apron areas.

Engineering drawings.

Physical inspection.

Observation of heliport operation.

Other References:

ICAO Annex 14, Volume II ('Heliports')

PERIMETER FENCE

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

Engineering drawings.

Physical inspection.

Courtesy: Bristow

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

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.

An IFR flight plan requires greater prescription in the routes and altitudes flown and fuel contingency planning. It will also provide a greater level of air traffic control services provided to the flight than would otherwise apply under a VFR flight plan. Air traffic control provided for IFR traffic will focus on traffic notification and positive separation services, and will also provide additional flight following.

Where it is not possible to conduct a flight under IFR, an aircraft operator may conduct the flight under VFR (where authorized by the responsible regulatory authority).

The aircraft operator should retain operational records associated with any flight for a period of 90 days.

Thunderstorms have the ability to significantly impact aviation operations and the threat must be understood by all flight crew.

The aircraft operator must document all techniques relevant to the aircraft type operated that are related to navigating around thunderstorms and avoiding the worst of the conditions that are associated with these systems.

Information will include:

- Avoidance techniques applicable to operations with or without serviceable weather radar equipment;
- Most likely location of severe turbulence, hail and lightning around the thunderstorm and the separation standards to be applied to avoid this;
- Precautions to be taken when overflying small but building storms;
- The minimum height at which to fly over a mature storm when clear of cloud; and
- The minimum lateral separation to be applied when avoiding upwind and downwind sides of storm cells both above and below the freezing level.

Additionally trigger lightning avoidance should be addressed in regions where this is prevalent (particular areas were cold positively charged air masses and precipitation coincide with helicopter operations).

Where weather data on triggered lightning strikes is available, this should be used as part of flight planning, based on established procedures.

Procedures.

Records.

Observation of flight preparation.

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.

Key flight safety considerations include ensuring relevant weather data and forecasts are made available to flight crew for flight planning purposes. Before commencing a flight, flight crew should have access to and assess the weather reports and forecasts for the route to be flown, destinations and alternates.

The aircraft operator should retain operational records associated with any flight for a period of 90 days or as required by regulation.

When aviation operations are conducted in remote areas outside the influence of reliable national meteorological coverage, effort must be made by the aircraft operator, assisted by the company if required, to access forecasted weather data from global sources.

Access to good quality weather data should always form part of a pre-mobilization planning.

Procedures.

Weather data access.

Observation of flight preparation.

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.

Reporting of actual weather conditions at a heliport or helideck significantly enhances the safety of the aviation operation. The prevalence of AWOS equipment provides greater guarantees to the effectiveness of this control rather than relying on having trained weather observers on site at all times.

However, either option satisfies the intent of the control.

Considerations:

- The AWOS should ideally have the capability of transmitting on a discrete frequency to arriving aircraft; and
- The ability to provide cloud base and visibility is an important aspect to an AWOS that should not be overlooked when procuring equipment.

Training required for a weather observer should include: the issuance of a radio operator licence for communication, training on all equipment required to take measurements and training associated with basic aviation meteorology. Any training course should be recognized by the national meteorology bureau or responsible aviation authority and typically are three to five days in duration. Recurrent training should be considered for weather observers.

Procedures.

Personnel records.

Equipment records.

Observation of weather observer.

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.

The Adverse Weather Policy should define limitations on the conditions jointly agreed between the aircraft operator and the company under which flying operations are restricted or temporarily halted.

In offshore operations probability of successful rescue in the event of a ditching or survivable water impact is a key factor to consider.

Procedures.

Risk assessment.

Records of application of the policy.

Other References:

UK CAA CAP 641 Report of the Review of Helicopter Offshore Safety and Survival, Recommendation 14.2 (O)

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.

The aircraft operator should have in place information, guidance and procedures regarding the recognition, avoidance and recovery from microburst and wind shear phenomenon, turbulence created by wind over an offshore facility's superstructure and gas venting.

Specific training and checking requirements should also be developed and implemented to ensure flight crew develop and maintain the:

- Knowledge needed to identify the actual or potential presence of wind shear; and
- Competencies required to successfully execute recovery procedures when wind shear is being encountered.

The documented procedures must, where required, expand on and be consistent with information and procedures provided in the aircraft approved Flight Manual or Flight Crew Operating Manual.

Where available, flight crew should be trained and checked on wind shear recovery procedures using an approved flight simulator that utilizes environmental data obtained from real events.

Procedures.

Syllabus of training.

Training records.

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.***

The hazards associated with frost, snow, ice and freezing rain must be understood by all flight crew and be constantly assessed throughout the flight.

Where aircraft are operated in a cold weather environment, the aircraft operator must have in place procedures that address ground and in-flight icing conditions. Initial and annual cold weather operations refresher training is required for all flight crew and ground staff where those functions are impacted by these hazards.

Winter operations training packages should be periodically reviewed by aircraft operators and incorporate the latest relevant information associated with the threats and hazards presented by cold weather operations.

Training programs for cold weather operations, including review of recent industry icing incidents, are typically scheduled for all relevant personnel prior to the onset of the winter season.

Procedures.

Syllabus of training.

Training records.

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.

No further guidance.

Procedures.

Aircraft records/inspection.

Courtesy: Aerossurance

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.

Weather radars fitted to aircraft are designed for the active detection of adverse weather conditions and allow flight crew to determine appropriate course changes to avoid the adverse weather.

It is important that aircraft operators provide adequate training to cover weather radar capabilities, limitations, operating procedures and interpretation to ensure the crew understands the system.

evidence

Procedures.

Aircraft records/inspection.


Courtesy: HeliOffshore

7.0: Collision in the Air

A helicopter and object collide in the air

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.

The aircraft operator’s procedures should require flights to be conducted at an altitude or flight level appropriate to the track being flown, unless otherwise assigned a different altitude or Flight Level by the appropriate ATC authority. Cruise altitudes are specified in the tables of cruising levels provided in Appendix 3 of ICAO Annex 2 – Rules of the Air.

Adherence to the specified tables of cruising levels in accordance with the direction of flight improves separation from conflicting traffic during cruising flight and reduces the risk of collision.

While the risk of in-flight collision with birds cannot be eliminated, it is recommended that strategies be considered by flight crew to minimize exposure to this threat when operating in areas of known migratory routes. Statistics reveal that the risk of birdstrike significantly reduces when aircraft are operated at higher altitudes.

evidence

Procedures.

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.

Maximizing the extent to which aircraft are operated in controlled airspace optimizes the safety benefits provided by controller initiated traffic separation. Reference to the flight planning the appropriate use of controlled airspace should be evident in the aircraft operator’s Operations Manual.

evidence

Procedures.

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.

Variables such as migratory routes, seasonal changes, bird species, localized feeding influences, availability of water, freshly cut grass and close proximity of refuse sites will all play a part in the presence of bird life. The availability of nesting habitats provided by hangars compounds the problem.

The key to any successful airfield bird control program is habitat control which involves making the airfield less attractive to birds. This requires an understanding of why a particular species of bird may be present in the area. In those cases where the problem is significant, specialist wildlife and bird control advice should be sought by the company. Expert guidance should also be sought before the construction of new heliports.

Passive measures (both on site and in liaison with other local landowners) include:

- Control of food and waste;
- Habitat control (including on-site management of grass and surface water [including transient accumulations], exclusion of roosting opportunities in buildings and trees);
- Netting; and
- Deterrent spikes, etc.

Active measures:

- Audio bird distress call systems;
- Pyrotechnics/visual deterrents;
- Predator response (using trained birds of prey); and
- Population control (e.g. egg waxing, shotguns, etc.) as permitted by local legislation.

Additionally, helidecks should be monitored for guano build up and appropriate cleaning undertaken.

evidence

Procedures.

Heliport/helideck inspection.

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.

The aircraft operator must have a procedure describing the action to be taken for ACAS alerts.

While ATC procedures and the 'see and avoid concept' will continue to be the primary means of ensuring aircraft separation, the provision of ACAS (also known Traffic Collision Avoidance System [TCAS]) is a significant control to prevent airborne collision.

This is particularly true in the degraded visual environments of night and instrument conditions where ACAS II functionality is an effective risk mitigation.

For the control to be effective, flight crew must be trained to respond to an ACAS alert or instruction in a timely and predictable manner compatible with the system design.

Correct response is dependent on the correct application of appropriate procedures and the effectiveness of initial and recurrent training in ACAS procedures. ACAS procedures should form part of the simulator recurrent training sessions.

evidence

Procedures.

Syllabus and Records of training.

Aircraft records/inspection.

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).

Such lights are usually white. Because of their intensity, restrictions should be placed on their use on the ground.

evidence

Procedures.

Aircraft records/inspection.

8.0: Ground Collision/Handling

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

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.***

Due to the relatively limited power margins that are likely to be encountered and the wide variation in passenger sizes, actual weights are required to be used.

Baggage is accompanied passenger luggage whilst all other items transported (including unaccompanied luggage) are classified as cargo.

Baggage and cargo should be loaded and secured by people appropriately trained to do so.

Items that are potential foreign object debris should not be carried by passengers, such as newspapers, loose leaf binders and any small objects capable of being picked up by circulating air and ingested into aircraft engines and/or rotating components.

Unrestrained items that could act as 'missiles' in the event of crash, impede seats 'stroking' downward in hard vertical impact scenarios or become obstacles in a flooded cabin should be prohibited.

Cargo carried in the cabin should be loaded in accordance with the limitations in the Flight Manual and the aircraft operator should have associated procedures. Certified tie-down hard points and approved nets and straps should be used.

evidence

Procedures.

Observation of loading.

Manifests and load sheets.

Other References:

Oil and Gas UK Guidelines for the Management of Aviation Operations

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.

The aircraft operator's load management procedures should specify the calculation methods acceptable, the center of gravity limits and the requirement for the Pilot-in-Command to authorize the final load calculation. An approved load-sheet (or approved alternative) must be completed prior to departure of the aircraft on each stage of every flight. Where a flight involves a number of sectors, a supplementary load sheet reflecting the loading at the initial sector and accounting for all changes in the load may be used for each subsequent stage on the same day.

The aircraft operator should retain records associated with flight for a period of 90 days or as required by applicable regulation.

evidence

Procedures.

Observation of flight preparation.

Records.

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.

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.

Regardless of previous flight experience, passengers maximize their chance of survival if they receive an appropriate pre-flight safety briefing, retain the information passed to them and can apply it in an emergency situation.

It is for this reason that regulatory authorities require that a comprehensive safety briefing be completed prior to each flight.

Video is the preferred medium for delivery of complex information in a standard format (plus it allows the ready use of sub-titles to assist passengers not familiar with the narration language). Dedicated videos for even minor differences in configuration should be expected for long-term contracts.

Verbal briefings, supplemented by printed material and/or reference to hardware, may be necessary for short periods due to changes in equipment configuration or procedures, lessons from accidents or other feedback. However, prompt updates of the video should be expected.

Care should be taken not to over complicate the video or include unnecessary detail. The information should be presented in a logical order (for example: boarding, in-flight, disembarkation and emergencies).

If agreed with the responsible regulatory authority and the company, a video brief may be valid for a specific time period (no greater than 24 hours) where multiple flights are expected in quick succession.

evidence

Procedures.

Review of briefing material.

Observation of flight preparation.

Other References:

Oil and Gas UK Guidelines for the Management of Aviation Operations

Australian CAAP 253-2(0)

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.

It is normally impractical for aircraft placards to contain more than two languages and if the available space is small it may be better to use the primary language only. Aircraft placards should only be introduced as configuration controlled aircraft modifications.

Passengers briefing cards should use internationally recognized symbols and graphics, as appropriate, to minimize the reliance on printed text.

There is a practical limit to the number of dedicated sub-titled video options that can be prepared and delivered.

While live simultaneous-translation may be possible in some circumstances, and a translated written brief may be a suitable supplement in occasional and isolated cases, passengers unable to fully comprehend the briefing will be a hazard to themselves and others. The practicality of any alternative mitigation (such as an escort) should be assessed prior to passenger acceptance.

evidence

Review of briefing material.

Physical inspection of aircraft.

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.

Studies have shown that shoulder size is the main discriminator in easily determining an individual's ability to egress through a confined exit.

In some countries passengers are measured and size data recorded to aid pre-planning. It is however permissible to subjectively assess passengers (for example during the passenger safety briefing). There should be a means in place to ensure the PCOs/HLOs are aware of who needs to be positioned next to larger exits.

In some locations first time passengers are indicated by a green arm band to aid PCO/HLOs and indicate that they may need extra assistance. The aircraft operator should have documented guidance.

Also see Defence 20.3.

evidence

Procedures.

Review of briefing material.

Observation of passenger handling and boarding.

Other References:

Oil and Gas UK Guidelines for the Management of Aviation Operations

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.

The aircraft operator's load management procedures must ensure that a passenger manifest is prepared for each flight or each sector of a flight where passenger or cargo loads change in anyway.

The load management procedures should require a check of the names of passengers allocated a seat on a flight against the list of personnel cleared for travel on a flight by the company.

There may be a requirement defined in the contract to interface with the company Personnel-On-Board (POB) system.

It is important that the passenger manifest compiled for each flight accurately reflects the occupants of an aircraft when in-flight to provide full accountability. However late changes in routings or load should be avoided as they create extra crew workload and distract from safety critical duties.

Completed passenger manifests should be retained on file for a minimum period of 90 days or in accordance with applicable regulation after the completion of the flight.

evidence

Procedures.

Records.

Observation of flight preparation.

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.

Appropriate measures must be taken to provide adequate control of all passenger movements to and from designated aircraft movement areas. The company and aircraft operator should agree whose responsibility it is to provide a PCO or HLO for each location and what responsibilities are to be fulfilled by the people carrying out these functions.

The aircraft operator and/or company should establish a syllabus for the initial and recurrent training of staff appointed to PCO positions or reference appropriate industry training standards and detail the process for certification of competency.
Also see Control 5.2

evidence

Procedures.

Personal records.

Observation of heliport/helideck operations.

Other References:

UK CAA CAP 437 Offshore Helicopter Landing Areas

Oil and Gas UK Guidelines for the Management of Aviation Operations

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.

Loading or unloading helicopters with the rotors turning introduces the risk of personnel and obstacles coming into contact with any of the dynamic components of the helicopter.

The aircraft operator must document the circumstances under which loading and/or unloading operations for helicopters with the rotors turning is authorized to occur.
Also see Controls 3.3 and 5.2.

evidence

Procedures.

Observation of heliport/helideck operations.

GROUND PROCEDURES

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

To ensure the safety of aircraft, equipment and personnel, the aircraft operator should document procedures relevant to the ramp or ground handling and maneuvering of each applicable aircraft type, expanding on the information provided in the Flight Manual and/or Ground Handling Manual (where available).

Such procedures should be developed to avoid errors that can occur during ground handling processes and create unsafe situations that may lead to accidents or incidents either directly involving ground handling personnel or the aircraft itself.

When not contained in the Operations Manual it is permissible to contain this detail in other controlled manuals.

The aircraft operator's procedures should be made available to all personnel who are allocated duties associated with ramp or ground handling of aircraft.

Procedures.

Observation of heliport/helideck operations.

Other References:

ICAO Annex 14, Volume II ('Heliports')

UK CAA CAP 437 Offshore Helicopter Landing Areas

Oil and Gas UK Guidelines for the Management of Aviation Operations

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.

If Dangerous Goods are to be carried, the aircraft operator must have appropriate procedures, facilities and trained personnel for the acceptance, storage and movement of Dangerous Goods.

All aircraft operators and heliport/helideck operators should have procedures and trained personnel able to screen for Dangerous Goods.

Dangerous Goods should only be carried if an aircraft operator has met the specific training, documentation, record keeping and incident reporting requirements of the responsible regulatory authority. In this case the Pilot-In-Command should be provided with a 'Shippers Declaration of Dangerous Goods'/'Notice to Captain'. Limitations in the Flight Manuals may also apply.

The aircraft operator should retain records associated with carriage of Dangerous Goods for a period of 90 days.

Procedures.

Observation of screening.

Records.

Other References:

IATA Dangerous Goods Regulations

Oil and Gas UK Guidelines for the Management of Aviation Operations

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.

For security purposes it is necessary to verify the identity of all passengers booked to fly, and confirm they are not carrying undeclared Dangerous Goods, weapons or other prohibited items.

It is also necessary to verify they meet the minimum requirements for helicopter transport and for working offshore.

Potential passengers who are behaving erratically need to be assessed for their fitness for flight.

Some criteria will be defined by legislation and regulation and some agreed between the aircraft operator and the company by contract. In some cases the company may require 'with cause' or random alcohol and/or drugs screening. There may also be requirements for health screening in relation to infectious diseases.

Whatever the case may be, the company and aircraft operator must have an agreed and documented process for passenger screening.

Procedures.

Observation of passenger screening.

Other References:

Oil and Gas UK Guidelines for the Management of Aviation Operations

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.

The clothing policy should be developed cognizant of environmental conditions, the likely time before rescue and the survival and safety equipment to be issued.

The policy may change seasonally.

The company must have a policy on whether it should be verified that passengers are in compliance with any ‘multi-layer’ requirements. Other requirements should be verified by designated personnel at the heliport/helideck.

Headgear is potential foreign object debris.

evidence

Procedures.

Observation of passenger screening.

Courtesy: HeliOffshore

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

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.

evidence

Procedures.

Observation of hot refueling.

Other References:

Oil and Gas UK Guidelines for the Management of Aviation Operations

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.

The risk of fuel exhaustion is greatly reduced when flight crew accurately determine that the amount of fuel on-board is sufficient for the flight planned. Determination of the actual quantity on-board should be cross-checked using a minimum of two sources, such as:

- Fuel Quantity Gauges;
- Dipsticks;
- Flow Meters/Totalizers; and
- Calculations from previous refuels and fuel usages (checked regularly for accuracy).

Accurate knowledge of fuel quantity at the start of a flight is essential for every single flight. All subsequent assessments to the safety of the flight are derived from that initial figure. If only one fuel quantity measurement is used, then it is not possible to determine if the system is working properly because there is no reference point that has been validated through a cross-check process.

The aircraft operator's procedures should require fuel quantity checks to be conducted prior to each flight and provide details of the acceptable methods for undertaking such checks. The aircraft operator's procedures should provide for the quantity of fuel on-board to be checked by two separate and independent methods and should state a maximum tolerance if any difference in quantities are determined by the two methods.

Flight crew should also regularly update fuel status, at least every hour, to ensure adequate reserves are maintained.

The aircraft operator should specify procedures for the flight crew to monitor in-flight fuel quantity, to detect any anomalies that may appear in planned versus actual fuel burn. Fuel flows greater than planned, stronger headwinds, in-flight fuel leaks and course deviations have all contributed to past resource sector accidents. Constant monitoring of fuel quantity at designated time intervals or waypoints is critical to the safe progress of any flight.

Procedures. Records.

Observation of flight preparation.

Other References:

Australian CAAP 234-1(1)

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.

An IFR flight plan requires greater prescription in the routes and altitudes flown and fuel contingency planning. It will also provide a greater level of air traffic control services provided to the flight than would otherwise apply under a VFR flight plan. Air traffic control provided for IFR traffic will focus on traffic notification and positive separation services, and will also provide additional flight following.

Where it is not possible to conduct a flight under IFR, an aircraft operator may conduct the flight under VFR (where authorized by the responsible regulatory authority).

The aircraft operator should retain operational records associated with any flight for a period of 90 days.

Procedures.

Records.

Observation of flight preparation.

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.

In some extreme circumstances, out of necessity, offshore alternates may be the only choice available. Risks associated with having an offshore installation or vessel as an alternate include:

- Sudden deck closure (e.g. crane, cargo, weather, fire or gas alarms); and
- An aircraft emergency requiring a running landing (e.g. hydraulics, tail rotor failures).

An offshore alternate must only be authorized, when the responsible regulatory authority allows it and after the completion of a risk-assessed process involving aircraft operator representatives and a Competent Aviation Specialist.

When an offshore alternate is approved:

- OEI landings must be possible for the aircraft type, at its calculated arrival weight at the destination and alternate in the ambient conditions; and
- A 'green' deck must be confirmed as being available for the offshore alternate prior to the aircraft passing the Point of No Return (PNR) on the outbound flight.

The installation selected as suitable for nomination as an offshore alternate must have an approved aircraft refueling capability with all recent serviceability and fuel testing checks completed.

Procedures.

Records of any risk assessment and regulatory approval.

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.

These reserves exclude the unusable fuel (as defined in the Flight Manual).

evidence

Procedures.

Records (including flight planning records, Load Sheets, Technical Logs and fueling records).

Observation of flight preparation.

Other References:
FSF BAR Standard Implementation Guidelines Control 3.4 and 3.5

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.

These reserves exclude the unusable fuel (as defined in the Flight Manual).

evidence

Procedures.

Records (including flight planning records, Load Sheets, Technical Logs and fueling records).

Observation of flight preparation.

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.***

No further guidance.

evidence

Procedures.

Records.

Physical inspection of fuel systems.

Other References:
FSF BAR Standard Implementation Guidelines Control 4.4

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.

Aircraft fuel has the ability to hold water, thereby contaminating the fuel being supplied to the engine(s). Water can be held in the fuel in a number of states including dissolved, in suspension and free. There are a number of fuel testing regimes available, but it is the aircraft operator's responsibility to document acceptable methods to confirm that the fuel is free of water contamination.

The requirement for flight crew to observe the fuel sample can be conducted real-time, or by viewing the fuel samples that were taken at the start of the day of refueling. If the latter method is used, the water detector capsule used to confirm an absence of water in suspension should also be available for flight crew to witness.

A means of verification by the offshore facility that this has occurred is a record of signature that the flight crew member has made the observation, whether real-time or by examination of marked samples taken on the same day and their associated records.

evidence

Procedures.

Records (including fueling records and audit records).

Observation of fueling.

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.

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.

evidence

Procedures.

Records (including audit records).

Physical inspection of fuel systems.

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.

Where taking fuel from a delivery nozzle is impractical due to the pressure and subsequent risk of fuel splash-back, taking a sample from as close to the delivery end as practical is permissible.

evidence

Procedures.

Records.

Observation of sampling and physical inspection of samples.

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.

No further guidance.

evidence

Procedures.

Records (including inspection and audit records).

Physical inspection of fuel systems.

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.

The use of drummed fuel should be limited to exceptional circumstances where no alternative is practical.

evidence

Procedures.

Records.

Physical inspection of drums, pumps and hoses.

Observation of refueling.

20.0: Aircraft Accident

Mitigating defences in the event of an aircraft accident

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).

The aircraft operator and company must consider the certification basis of the aircraft type (normally defined within the Type Certificate Data Sheet [TCDS]) and subsequent modifications, including any Special Conditions, Equivalent Levels of Safety and Exemptions, and other design evidence when appropriate, when offering/selecting aircraft for all contracts.

See also Enabler 1.7

evidence

Aircraft records/inspection.

Aircraft certification standards.

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.

All seats should be provided with, as a minimum, a harness restraint system that is fitted with double-strap inertia shoulder harness (four-point system). The shoulder and lap straps should all be separate. There should be a means of quick release able to be activated with a single hand.

Seats may be fitted with a five-point system with an additional crotch strap.

All harness straps should be worn when seated.

evidence

Procedures.

Aircraft records/inspection.

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).

It is important that the flight crew have the capability to pass information to passengers, not only of a general nature, but also when faced with diversions, holding or when declaring an emergency and adopting the brace position.

Use of a loudspeaker PA system is the typical solution and should be set at an appropriate level and be clear enough to be heard and understood by all passengers (allowing for any hearing protection).

Wireless headsets are a possible alternative. The provision of multiple plug-in headsets is not a recommended option unless double disconnect cords are fitted, as headset cords can hinder emergency egress by snagging exiting passengers.

evidence

Aircraft records/inspection.

Other References:

066 Norwegian Oil and Gas Recommended Guidelines for Flights to Petroleum Installations para 7.3

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).

It should be noted that some helicopter manufacturers in the past designed aircraft with flotation systems designed for Sea State 4, which is often exceeded in many of the operational areas offshore helicopters are used. Local sea conditions should be examined by reference to metrological and oceanographic data.

Certification testing uses certain assumptions that mean that the certified value is a guide not a guarantee of performance.

Automatic float deployment increases the chances of floats being deployed promptly, which is of particular importance when the entry to water is inadvertent and not prepared for by the crew.

The aircraft operator should have procedures to arm automatic float deployment systems when making offshore or other over water takeoffs and landings. If permitted in the Flight Manual, the automatic float deployment system should be permanently armed over water.

evidence

Aircraft records/inspection.

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.

Having the knowledge and skills necessary to assist with survival in an offshore environment, significantly increases the chances of surviving such an emergency situation. HUET courses will increase an individual's knowledge of safety procedures and ability to successfully exit an actual ditching involving a submerged helicopter. The ability of a METS trainer to submerge, and then roll inverted, provides a realistic training environment and is the minimum standard considered acceptable for offshore operations.

The HUET course should include appropriate sea survival training, including the use of representative survival equipment (e.g. life jackets, survival suits and EBS where used) deployment and boarding of liferafts, etc.

Whereas it would be ideal to train with the exact aircraft exit configuration and equipment it is recognized that many workers will generally travel on multiple aircraft types in the period between HUET courses. However the training should be as representative as is practical of general helicopter egress and survival. It should be supplemented when needed with training on specific equipment.

Procedures.

Personnel records.

Other References:

OPITO Standard for HUET

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.

The direct line of sight requirement means that the occupant can see the route to the exit prior to egress and that there are minimal obstructions in the way.

Handholds may be seats, structure or specific handles. These provide both a means of orientation and a means for the occupant to pull themselves towards the exit.

The exits may be either jettisonable exits or push-out windows. As guidance, an unobstructed 559x356mm (22x14inch) ellipse is an appropriate size for the majority of passengers wearing survival suits.

The ideal is to have two exit routes, one with no more than one occupant between them and escape.

Aircraft records/inspection.

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.

Emergency Exit Lighting Systems illuminate to provide visual confirmation of the emergency exits location. Activation should be automatic. The lighting should continue to operate after flooding or capsize of the cabin.

Emergency exit lighting is generally self-illuminating luminescent strips or powered from a self-contained battery packs. The Maintenance Program should include appropriate actions to ensure illumination does not degrade over time.

Exit lighting is beneficial for both night and day operations. Even if every occupant is seated next to an exit, such lighting is valuable as it provides orientation as well as assisting in finding an alternative exit in the event of an exit being obstructed or jammed.

Aircraft records/inspection.

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).

Push-out windows provide alternate and readily accessible escape paths to supplement other exits. The most common variety is where a tag is pulled to progressively remove a seal from around the window. The window can then be pushed out, permitting escape.

The time and physical effort to operate windows should be appropriate for emergency egress and the method compatible with both occupants who have been immersed in cold water and survival equipment (e.g. gloves).

As guidance, an unobstructed 559x356mm (22x14inch) ellipse is an appropriate size for the majority of passengers. The 430mm by 350mm size (~17x14inch) is a minimum size practical for smaller occupants.

Also see Control 8.3.

Aircraft records/inspection.

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.

EBS provides a means to overcome cold water shock, the phenomenon that can result in victims being unable to hold their breath when submerged and suffering an automatic gasp response that can result in breathing in water. Certain types of EBS can also allow a victim who was unexpectedly submerged and unable to fill their lungs with air first, to breath underwater. The availability of an assured air supply should also reduce the risk of panic when submerged.

Category A EBS can be deployed underwater and is of use in sudden water impacts and unannounced ditching (which are potentially more likely a night or in IFR conditions) or immediate capsizes (which are more likely as the limits of certified ditching performance are approached. Category A systems are most likely to rely on breathing from a compressed air source.

Category B EBS is deployed after ditching but before submersion. They are more likely to rely on breathing from a counter lung, filled with air at the time of deployment. Such re-breathers do however have a limited duration.

The choice between Category A and B may be determined by risk assessment based.

The EBS should be compatible with life jackets and any survival suits used. Training is critical and should be delivered in a manner consistent with the risks (particularly when breathing from a compressed gas supply). An appropriate maintenance schedule (including pre-flight inspection) should be in place for these items.

evidence

Procedures.

Physical inspection.

Aircraft records/inspection.

Observation of passenger handling.

Other References:

UK CAA CAP 1034 Development of a Technical Standard for Emergency Breathing Systems

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.

The life jackets issued should suit the individual user's size.

Spray hoods should be fitted as they provide an effective method of preventing progressive drowning from wind induced spray and waves breaking over a survivor's face.

Other items that should be carried on life jackets include:

- A life line to enable survivors to tie themselves together;
- A light to attract attention, (preferably strobe);
- A whistle to enable survivors to attract attention;
- A grab handle to enable rescuers to more easily bring survivors into a rescue craft; and
- Reflective tape to improve visibility to rescuers at night.

A crotch strap is the usual method to prevent life jackets riding up.

Non-aviation life jackets should not be used.

Survival suits with an integral life jacket function are acceptable if designed to an appropriate TSO.

Crew life jackets should also be equipped with day/night flares.

Life jackets should be compatible with any survival suits and EBS used.

An appropriate maintenance schedule (including pre-flight inspection) should be in place for these items.

Where life jackets are equipped with a PLB, it should be fitted in a way to keep the PLB clear of the water.

evidence

Procedures.

Physical inspection.

Aircraft records/inspection.

Observation of passenger handling.

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.

Survival suits greatly increase the chance of survival in cold sea conditions through the delay in the onset of hypothermia. The normal calculation of survival times involves a combination of air and water temperatures; hence survival suits may only be required at certain times of the year.

Survival suits are not an alternative to the provision of appropriate SAR cover.

The survival suit issued should suit the individual user's size (including at seals).

Hoods and gloves (integral or supplemental) should be issued if required by the environmental conditions as should separate thermal liners.

Survival suits with an integral life jacket function are acceptable in place of a life jacket if designed to an appropriate TSO.

Survival suits should be compatible with life jackets and any EBS used.

Based on research yellow is the preferred color for passenger survival suits (orange is a common color of marine debris).

Crew survival suits must be compatible with flight operations and not create glare or other distracting reflections in the cockpit.

An appropriate maintenance schedule (including pre-flight inspection) should be in place for these items.

evidence

Procedures

Pre-flight safety video.

Physical inspection.

Equipment records/inspection.

Observation of passenger handling.

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.

A ditching scenario ideally allows the helicopter occupants to be able to enter liferafts 'dry' while they are tethered alongside the helicopter.

Liferafts intended for use in hostile environments must have features that make boarding in high sea states by survivor exposed to cold conditions practical.

Liferaft design certification rules mean that each liferaft has a "standard" and "overload" survivor capacity. The overload capacity is for use when one of the liferafts is not accessible and allows for all occupants to be able to utilize the remaining liferaft.

Offshore survival kits including signaling devices should be carried in the liferafts and are typically tethered to the liferaft by a lanyard.

External liferafts can be more speedily deployed that internal liferafts and without the physical effort. They free cabin space and avoid inadvertent deployment inside the cabin. They should be mounted so that they are not likely to be damaged during a controlled ditching. There should be a method to release external rafts from a capsized helicopter. All means of external liferaft activation should be readily identifiable under all expected conditions.

evidence

Aircraft records/inspection.

Other References:

066 Norwegian Oil and Gas Recommended Guidelines for Flights to Petroleum Installations para 7.7

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.

A rescue firefighting capability will focus on providing a first response capability for the rapid evacuation of an aircraft's crew and passengers in an emergency scenario. This capability will vary depending on the size of the aircraft being operated.

Key principles for the provision of a rescue firefighting capability supporting resource sector operations include:

- The level of firefighting and rescue capability should be risk-assessed as being appropriate for the activity undertaken;
- Personnel tasked with a firefighting role should receive appropriate initial and recurrent training on the likely scenarios and the equipment being used;
- Annual exercises using the full firefighting resources available should be conducted as a minimum;

- When introducing a new aircraft type the aircraft operator should provide an overview of the type's fire considerations to supporting rescue personnel. This should include location of aircraft fuel tanks, emergency exits and their external operation, wheel brake areas likely to get hot in run on landings, basic aircraft fuel isolation, engine emergency shutdown and hazardous materials and items; and
- A discussion on the various types of fire suppression, including compressed air foam systems, and their relative merits should be conducted with firefighting specialists when designing new heliports and helidecks.

Records.

Physical inspection.

Training records.

Observation of heliport/helideck operation.

Other References:

ICAO Annex 14, Volume II ('Heliports')

UK CAA CAP 437 Offshore Helicopter Landing Areas

Oil and Gas UK Guidelines for the Management of Aviation Operations

FIRST-AID KIT AND FIRE EXTINGUISHER

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

Where not defined by regulatory requirements, the contents of first-aid kit(s) should be determined by specialist medical advice and applicable for the type of activities being undertaken.

The first-aid kit(s) should be stored in an appropriate location in the aircraft to ensure ready access in-flight.

The first-aid kit(s) should be sealed (for protection of the contents and to indicate when used) and be included in the aircraft Maintenance Program and subject to periodic inspection.

Procedures.

Aircraft records.

Physical inspection.

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.

Every flight should be considered as a potential survival situation requiring survival equipment appropriate to the location and climate. This may consist of a kit package within the liferafts themselves or it may be supplemented by additional carry-on kit.

The survival kit should be sealed (for protection of the contents and to indicate when used) and be included in the aircraft Maintenance Program and subject to periodic inspection.

Procedures.

Aircraft records/ inspection.

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.

Satellite flight following significantly reduces the time required to locate an aircraft and respond to an emergency situation, in turn maximizing the chances of survival where aircraft operations are conducted in hostile environments.

It is vital that aircraft using satellite flight following systems are monitored continuously by dedicated personnel as ELT transmissions do not always occur.

Flight following personnel may be stationed at the operating base or a centralized monitoring center; however they need to be able to activate an emergency response when necessary without delay.

The Operator's Operations Manual (or equivalent document) should contain job descriptions that include the roles and responsibilities for flight following positions and the associated training requirements. It should also detail the process by which their ongoing competencies are assured. The documented training requirements should adequately address management of the flight following function in both normal and emergency operations. Where personnel associated with flight following are to utilize radio communications equipment that transmits over the aeronautical radio communication network, documented requirements must detail the training and licensing that applies.

Procedures.

Aircraft records/inspection.

Training course syllabus.

Training records.

Observation of flight following.

Other References:

066 Norwegian Oil and Gas Recommended Guidelines for Flights to Petroleum Installations para 7.1

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.

ELTs are distress beacons that are activated following an aircraft accident. Activation can occur either automatically via a crash sensitive switch that detects excessive force of deceleration, by immersion in water or manually.

Each 406MHz ELT has a discrete digital code that, when activated, transmits a position and identification signal that is detected by satellites within the international Cospas-Sarsat system. This information is then transmitted back down to ground stations where the discrete code is read, enabling the source of the transmission to be identified (aircraft registration and location) and the owner of the aircraft determined.

ELT registrations are required to be updated to reflect the current operator and contact details. The aircraft operator's point of contacts should be registered with the applicable authority.

ADELTS are designed to separate from the aircraft and float after a ditching.

406MHz ELT signals are periodic (approximately one transmission per minute) and are not suitable for homing, hence the need for an accompanying 121.5MHz signal.

evidence

Aircraft records/inspection.

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.

The requirement for helicopter flight crew to wear a voice-capable PLB addresses several lessons-learned from past accidents:

- Back-up source of location in the event the ELT does not activate;
- The ability to communicate to searching aircraft to assist in locating survivors; and
- The ability to communicate the condition of the survivors to the searching aircraft, and whether there is a requirement to winch the critically injured out prior to last light before a ground party can reach the accident scene.

The requirement to have the PLB carried in a survival vest on the flight crew is to maximize the opportunity of its use in any accident scenario.

evidence

Aircraft records/inspection.

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).

Passenger PLBs are solely to aid a SAR helicopter locating survivors. The beacon's transmission should not interfere with the aircraft ELT or crew PLBs, should be manually activated and have a ready means to de-activate.

evidence

Aircraft records/inspection.

Other References:

Oil and Gas UK Guidelines for the Management of Aviation Operations

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 (see next page).

Successful response to an emergency begins with effective planning. The company, the aircraft operator and the operators of heliports/helidecks should develop documented ERPs detailing what should be done after an accident and who is responsible for completion of each action.

An ERP provides the basis for adopting a systematic approach to managing the organization's affairs and operations following a significant and unplanned event and should be practiced and reviewed regularly.

The ERP should cover all credible emergency scenarios.

A Competent Aviation Specialist should be involved in the development of the ERP.

The Defence section of this Standard is broken down into sub-sections to aid the examination of each layer of the defences in the event of ditching or survivable water impact.

A comprehensive risk assessment should consider the expected time in the water (making the assumption that survivors are not able to board liferafts) and address the following factors as a minimum:

- SAR capability:
  - Helicopter: serviceability, performance, size, equipment, day/night hoist capable, maximum number of survivors that can be winched with regard to aircraft weight and fuel limitations and hoist duty cycles;
  - Helicopter SAR unit experience levels (including training and recency) and other commitments (e.g. how great is the possibility the helicopter will be committed to other missions and unable to respond in a timely manner);
  - Survivors: maximum number requiring retrieval (including crew);
  - Vessel: availability, search capability, methods of retrieval, communications compatibility with search aircraft;
  - Response time (including readiness level, time to launch, transit and on-station times);
  - Search capability (detection of all survivors and likely spread of survivors);
- Weather and sea state (including sea temperature and wind);
- Proximity of other installations, their refuel and medical capabilities;
- Last light considerations; and
- Medical capability on-board the SAR helicopter or vessel and the time to reach hospital care.

The expected SAR recovery time should be calculated with realistic pessimism and should not be confused with the time to simply locate survivors. Assumed times should be no better than those proven in representative exercises or real rescues.

In the case of government operated SAR assets, unless evidence is available to determine the effectiveness and capability of their SAR service, a degree of pessimism should also be applied in relation to availability, response time and operational capability/effectiveness.

Extra mitigations potentially include use of survival suits (Survival Goal 20.4), Category A EBS (Survival Goal 20.3) and passengers PLBs (Survival Goal 20.6). However, issue of extra personal survival equipment is not an alternative to appropriate SAR cover. It may also be necessary to contract for dedicate SAR cover (see below) as part of, or supplement to, the crew change helicopter contract.

evidence

Procedures.

Records.

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.

A Competent Aviation Specialist should be involved in the risk assessment.

The risk assessment should be reviewed every time changes occur in local SAR cover or when changes to the contracted air operation occur that might affect SAR (e.g. use of larger aircraft, more distant installations, etc).

It may be appropriate to share dedicated SAR cover with other companies operating in the immediate area as a practical means to economically supplement local SAR cover. Any such sharing and the associated call out mechanism (see Control 14.4) should be formally agreed.

Appendix 4 covers SAR standards.

evidence

Procedures.

Records.

Other References:

International Aeronautical and Maritime SAR (IMSAR) Manual (IMO/ICAO Doc 9731-AN/958)

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.

A cockpit voice recorder (CVR) records the audio environment in the flight deck of an aircraft and a Flight Data Recorder (FDR) monitors and records specific aircraft performance parameters.

Outputs from CVRs in particular are protected by regulations.

The term ‘crash-protected’ relates to meeting an internationally recognized standard for CVR/FDR crash-protection.

The term ‘crash-resistant’ relates to the ability of the recorded data to survive a more limited level of impact, fire and submission in water following an accident. It is accepted that in some extreme cases this data will not survive but the intent is that in the majority of helicopter accidents data should be recoverable.

The aircraft operator should have access to the data frame reference to aid decoding of recorded information.

Periodic inspections of recording systems should be included within the Maintenance Program to verify coverage and quality of the recorded information.

The MEL should specify the conditions under which flight can be undertaken with recorders fully or partially unserviceable.

evidence

Procedures.

Aircraft records/inspection.

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.

No further guidance.

evidence

Records.

Courtesy: HeliOffshore

Appendices

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.

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
20.3	Push-out Windows	✓	✓	✓	✓	✓	✓	N/A	All
20.3	EBS	✓	✓	N/R	✓	✓	✓	N/A	All
20.4	Life Jackets	✓	✓	✓	✓	✓	✓	N/A	All

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
20.4	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

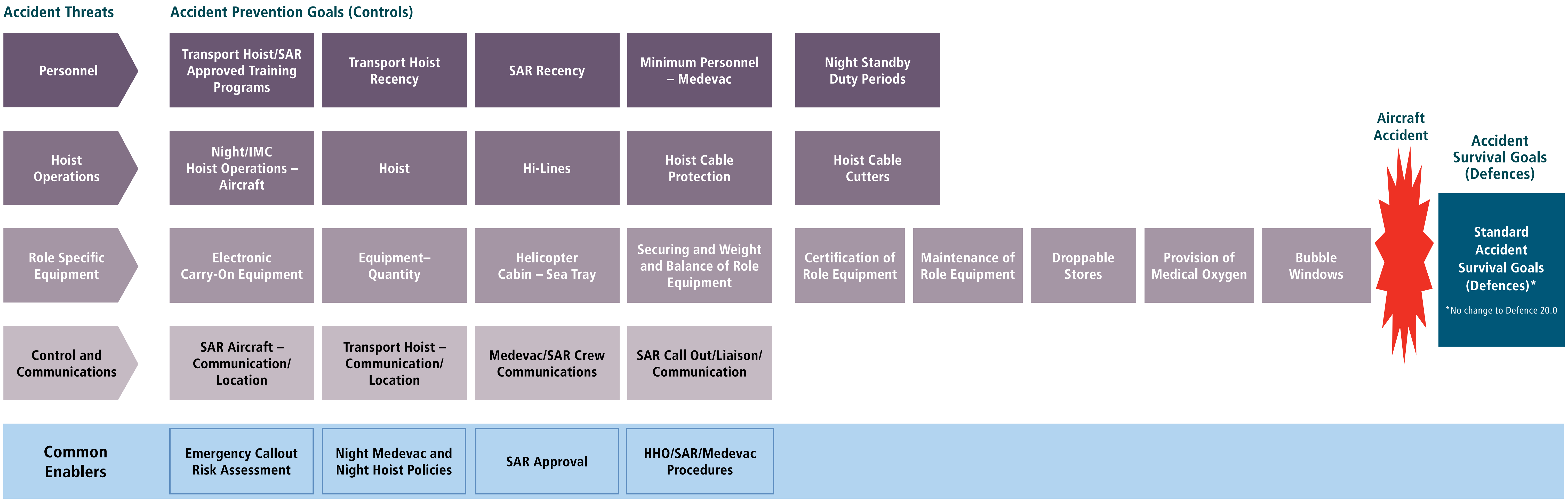
(1) If determined during risk assessment based on available SAR response capability.

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
FOD Foreign Object Debris
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.



4 TRANSPORT HOIST/MEDICAL EVACUATION (MEDEVAC)/SEARCH AND RESCUE (SAR)

10.0: Common Enablers

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.

The risk assessment must consider the circumstances of the proposed Medevac or SAR and consider the risk to crew, other occupants and the aircraft if the flight proceeds.

evidence

Procedures.

Records.

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.

Night operations carry a higher risk (especially if night operations are not regularly performed) and there is a greater complexity locating and recovering personnel in the event of ditching. Hence such operations should be minimized and the company should have procedures that support such a policy.

evidence

Procedures.

Records.

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.

The aircraft operator should be readily able to demonstrate they have the required approvals or exemptions necessary to provide an effective contracted SAR service.

evidence

Records.

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.

These shall supplement those described in Enabler 1.8.

Courtesy: HeliOffshore

11.0: Personnel

Crews are adequately constituted, trained, current and rested

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.

Guidance on such training can be found in UK CAA CAP 999 Chapter 4.
This training should supplement that required in Enabler 1.4 and Appendix 1.

Procedures.

Training syllabus.

Records.

Other References:

UK CAA CAP 999

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.

This training should supplement that required in Enabler 1.4 and Appendix 1.
Training should include regular simulation of hoist emergencies.

Procedures.

Records.

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.

This should supplement that required in Enabler 1.4 and Appendix 1. The company should fund a specific number of training hours in the contract. As a guide the minimum flying for a dedicated 24 hour all weather SAR aircraft is typically 30 hours per month. This requirement is both to ensure crew proficiency and aid aircraft serviceability. Very low utilization aircraft tend to suffer increased reliability problems; which is not ideal for emergency call-out situations. Training should also include regular simulation of hoist emergencies. It should be noted that the skill to deploy air droppable liferafts and survival kits safely and accurately is similar to the level of skill required to conduct hoist operations at low level over the sea. Air dropping should not be considered a cheap alternative or contracted without the appropriate training.

Procedures.

Records.

Other References:

UK CAA CAP 999

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.

The number of medical personnel must be as a minimum consistent with the level of medical care expected in-flight.

Where a SAR helicopter is used, appropriately qualified SAR personnel may fulfil this requirement. However the medical escort should be involved in the hand-over of the patient to the receiving hospital, therefore it may be preferable for an offshore medic to accompany the patient to provide continuity of care.

The medical escorts are also responsible for the patient in the event of an emergency and should consider the means of evacuation available.

Procedures.

Records.

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.

SAR specific rosters must be carefully considered so as to minimize the risk of fatigue.

During night training the FLIR and NVIS should be used.

Procedures.

Records.

Physical inspection of accommodation.

12.0: Hoist Operations

Aircraft are appropriately equipped for hoist operations

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.

A 4-axis auto-hover capable Autopilot is essential for night and IMC SAR/hoist operations and is also a preferred for day/VFR operations.

Modern FLIR turrets usually contain both infra-red and electro optic sensors. IR is particularly useful for search purposes. FLIR is also a preferred fit for day/VFR SAR operations.

Automated tracking features are increasingly becoming available on new FLIRs and should be considered if available as they enhance the ability to identify survivors.

Aircraft records/inspection.

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.

Twin hoists are preferred for all operations as they provide redundancy and avoid the risk that SAR crewman are left on a vessel or raft.

Aircraft records/inspection.

12.3: Hi-Lines

Ensuring the obstacles near the winching area can be avoided.

Hi-lines must be available to assist hoist operations.

By lowering the Hi-Line to the vessel's deck, and positioning the helicopter to one side of the vessel, the vessel's crew can pull the SAR crewman onto the deck using the guidance of the Hi-Line, thereby avoiding masts and other obstructions. This functionality is particularly useful in high sea states or confined spaces.

evidence

Aircraft records/inspection.

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.

Preventing contact with the aircraft structure removes the possibility of damaging either the cable or the aircraft and removes the possibility of cable snagging. Any modifications should be certified.

evidence

Aircraft records/inspection.

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).

Such cutters should be readily usable and stowed near the doorway and close to the hoist cable.

evidence

Aircraft records/inspection.

13.0: Role Specific Equipment

Aircraft have appropriate role equipment

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.

The aircraft operator should have a process to determine electromagnetic compatibility and the required battery life for battery powered devices. Where carry-on items are provided by third parties (such as a medical service provider) these requirements should be communicated prior to contract commencement.

evidence

Procedures.

Records.

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.

In addition to certain items of role equipment mentioned in other Controls, appropriate equipment should be fitted/carried for medevac, SAR and transport hoist operations.

The aircraft operator should define what the minimum configurations are for each mission.

Consumable items (such as medical supplies) should be inventoried and replenished after use.

Appropriate training and procedures should be provided as necessary for the use of role equipment.

evidence

Aircraft records/inspection.

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.

A sea-tray is a liner inserted into the cabin. It must be waterproof, easy to clean and non-slip. It should be a certified modification and therefore meet cabin flammability requirements.

Aircraft records/inspection.

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.

Loose items in the cabin are a threat in the event of a crash, are potential Foreign Object Debris (FOD) and become vulnerable to being lost overboard during winching.

Procedures.

Aircraft records/inspection.

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.

All role equipment should meet appropriate certification requirements or otherwise be demonstrated to be fit for purpose. Care should be taken to ensure that removable aircraft equipment is correctly identified as such and not inadvertently treated as carry-on equipment.

Procedures.

Aircraft records/inspection.

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.

This control supplements Control 2.4.

Aircraft equipment should be included within the aircraft Maintenance Program, though it is acceptable to reference separate Maintenance Programs for large removable serialized items such as a hoist. Other carry-on equipment should have defined inspection or maintenance requirements.

Recording of critical usage parameters (such as hoist cycles) shall be defined.

Procedures.

Aircraft records/inspection.

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.

It is critical that attention is paid to the risk of inadvertent inflation of droppable stores to ensure they do not activate in-flight. Specific attention should be focused on lanyards, ropes and other devices to ensure that they cannot entangle tail rotors, etc.

Procedures.

Aircraft records (including flight manual supplement etc.)/inspection.

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.

This control supplements Control 13.6 and covers both the quality of oxygen and the integrity of the cylinders, recognizing that these may be provided by a number of potential organizations. Additionally such cylinders can be classified as Dangerous Goods in certain circumstances and the aircraft operator should be able to demonstrate that they can carry oxygen cylinders both with a patient and when on positioning flights, or have practical procedures to ensure oxygen is available when needed.

evidence

Procedures.

Records/inspection.

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.

These should be positioned such that are adjacent to a suitable seating position.

evidence

Aircraft records/inspection.

14.0: Control and Communications

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

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.***

The 121.5MHz homing capability is required to search for survivors who are using PLBs or an ELT.

It is expected that 406MHz transmitted position data would either be received directly and either displayed in tabular form or overlaid on to a navigation display. Alternatively receiving such data indirectly but promptly in digital format from another source (such as a Rescue Coordination Center) is acceptable.

The marine band radio and AIS allow the location, identification and communication with vessels.

evidence

Aircraft records/inspection.

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.***

The marine band radio and AIS allow the location, identification and communication with vessels.

evidence

Aircraft records/inspection.

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.

No further guidance.

Aircraft records/inspection.

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.

The call-out procedures should be rapid and the aircraft operator should only be responsible for meeting agreed response time from after the formal call-out request is issued. It would be usual for the company to identify a 'duty officer or 'coordinator' who would act as the focal point, potentially someone involved in other coordination functions. Ideally this should be a service provided from a 'desk' manned permanently during the period of SAR stand-by.

The Pilot-In-Command has final responsibility for determining if the request can be safely performed. It is acknowledged that there may be occasions when it is permissible to use a stand-by SAR helicopter for non-SAR duties (medevac being a common example). The agreed call out procedures should ensure that it is clear what type of service is being requested. For example moving an offshore worker ashore on compassionate ground (e.g. to be with a sick family member) or repositioning workers due to unavailability of sufficient accommodation should be completed under normal transport approvals and an equivalent level of safety. The same logic applies to patient transfers.

Where the SAR service is 'shared' between several customers the call-out procedures need to be unambiguous on who requires the flight as well as who may request and approve it.

Where the company is prepared and able to release a dedicated SAR helicopter to support other agencies, the call-out procedures should deal with all aspects of their approval and notification of stakeholders.

Coordination with any local Rescue Coordination Center is essential to help de-conflict search and rescue traffic and optimize the operation.

It is usual to define response times in minutes from call to airborne (or to taxi in locations were air traffic delays are likely to be a factor). It is possible to agree different reaction times for day and night. Where the aircraft operator is aware of an issue that temporarily compromises the contracted reaction time or reduces the available service, this should be communicated to agreed stakeholders promptly. The company should ensure their contracting mechanism does not unfairly penalize open and honest feedback on potential response time, while equally the aircraft operator should ensure that they are resourced and able to routinely achieve the contracted response time.

The use of non-dedicated aircraft (i.e. crew change aircraft re-configured for SAR when a call-out occurs) is normally only viable for operations in non-hostile environments or as secondary support to a prime SAR helicopter.

Procedures.

Records.

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