FLIGHT SAFETY FOUNDATION

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Basic Aviation Risk Standard

Contracted Aircraft Operations

Version 9, May 2022

Contents

Purpose

This Standard provides companies with minimum requirements for performing risk-based management of the aviation operations that support their activities.

All national and international regulations pertaining to aviation operations must be followed. This Standard is designed to supplement those requirements.

Document Structure

The Standard is presented in a risk-based format to emphasize the relationship between threats to aviation operations, associated controls and applicable recovery/mitigation measures as presented in Figure 1.

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

All companies and aircraft operators are encouraged to further risk assess all controls to the level of detail they consider necessary for their individual operations.

When the term 'where appropriate' is used anywhere in the text of a control or defence, reference to the BARS Implementation Guidelines will provide additional context to the use of 'appropriate'.

Each BARS control and defence has been provided with a **Safety Goal** to assist users of the BAR Standard to identify the purpose of the control or defence and a pathway towards creating a performance indicator to measure the effectiveness of the organization in achieving a desired level of safety performance.

Change bars have been utilized to indicate material changes to the content or intent of the Standard.

Aircraft Operator Review

This Standard is designed to be used as a primary reference for the review and approval of aircraft operators supporting companies in the resource sector. Aircraft operators will be audited to the BARS Question Master List with questions drawn from this Standard and the ICAO Annexes.

Variations

Any variation to this Standard is at the discretion of each company. It is recommended that each variation be assessed to demonstrate that the risks associated with the variation are tolerable and justify safe continuation of operations.

A diagram showing the Basic Aviation Risk Standard Variance Process is presented in Figure 2 on page 8.

Key Definitions

Company

Refers to the individual entity using this Standard to support their aviation operations.

Operator

Refers to an aircraft operating company used to provide aviation services.

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; or search and rescue response/capability cannot be provided consistent with the anticipated exposure.

Non-hostile environment

An environment in which a successful emergency landing can be reasonably assured and the occupants of the aircraft can be adequately protected from the elements. Search and rescue response/capability can be provided consistent with the anticipated exposure.

Long-term contract

Any contract using dedicated aircraft for a planned duration of greater than six months.

Competent Aviation Specialist

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

Mountainous Area

Refers to an area of changing terrain profile where the changes of terrain elevation exceed 900 m (3000 ft) within a distance of 18.5km (10nm) (EASA)

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

Figure 1: BARS Bow Tie Risk Model – Schematic of Aviation Risk Management Controls and

Recovery Measures.

- Destination Weather Reporting
- Slope Guidance

- VFR Fuel Plan
- Hot Refueling

- Drummed Fuel

- Special VFR Procedures
- Stabilized Approaches
- Go-around Procedures
- TAWS

- Electronic Flight Bags (EFB)
- Fire Containment Bag

- Passenger Briefing
- Multi-language Briefing

- Perimeter Fence
- Airfield Control

- High Intensity Strobe Lights

- Aural Cabin Pressure Warning System
- Critical Maintenance Tasks (CMTs) and Independent Inspections

- Cold Weather Training
- Mountain Flying Training (Helicopters)

- Cleaning of Aircraft Post Evacuation Mission
- Arrival at Destination

Aircraft Accident

Recovery Measures:

Aircraft Certification Standards

Emergency Response Plan (ERP)

Emergency Locator Transmitter

Satellite Flight Following

Flight Following

Survival Kit

Flight Crew PLB

First Aid Kit

Passenger Dress Requirements

Cockpit Voice Recorder (CVR)/
Flight Data Recorder (FDR)

Upper Torso Restraint

Limitations in Sideways Seating

Crash Boxes

First Response to Aircraft
Incident on Airfield

Insurance

Post Event Management

BARS® BASIC AVIATION RISK STANDARD
FLIGHT SAFETY FOUNDATION

Version 9, May 2022

All Threats 1.0: Common Controls

Common controls that apply to all threats outlined in this Standard

Common Control 1.1: Safety Leadership and Culture

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

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

Common Control 1.2: Safety Intelligence

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

Safety Intelligence

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

Organizations must share safety occurrences using locally applicable manadatory and voluntary safety reporting schemes.

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

Organizations must examine available external occurrence and accident reports and safety promotion material and identifiy relevant lessons and necessary internal actions.

Aviation Risk Owner/Control Owner

Where organisations are contracting long-term aviation operations they may choose to have nominated Risk and Control Owners managing and overseeing the contracted aviation risk. To aid in safety intelligence and provide necessary understanding and risk awareness, anyone identified for risk and control ownership duties should undergo formal training that provides an overview of aviation risk, threats, controls and mitigation in addition to providing an overview of primary responsibilities in this role. The training should be delivered by an aviation specialist and content meet, as a minimum, the course outline of the Managing Contracted Aviation Risk as presented by the Flight Safety Foundation.

Common Control 1.3: Approved Aircraft Operator

Ensuring use of licenced and approved aircraft operators only.

Use only licenced aircraft operators who have been approved for use by company established process and where necessary, a Competent Aviation Specialist.

Common Control 1.4: Flight Crew Qualifications, Experience and Recency

Ensuring flight crew are competent to fulfill their duties by having appropriate training, qualifications and experience.

Flight crew must meet the requirements listed in Appendix 1.

As an alternative to the strict hours compliance requirements expressed in Appendix 1, a number of Competency Based Training (CBT) pathways have been approved for use under the BARS Program. The CBT provides an alternate pathway to pilot qualification and experience requirements, while still providing an equivalent level of safety. Use of the CBT pathway is subject to client company approval and review of the program by the Competent Aviation Specialist. Specific detail on each of CBT options can be found in the BARS Implementation Guidelines.

Common Control 1.5: Flight Crew Check and Training

Ensuring flight crew continue to remain competent and appropriately trained and are familiar with the operating environment.

Flight crew must receive annual training to the standards of the appropriate civil aviation authorities and 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 winter conditions 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.

Common Control 1.6: Maintenance Personnel Qualification

Ensuring maintenance personnel are competent to fulfill their duties by having appropriate training, qualifications and experience.

Maintenance personnel must meet the experience requirements listed in Appendix 1.

Common Control 1.7: Maintenance Training

Ensuring maintenance personnel continue to remain competent and appropriately trained.

The aircraft operator or approved maintenance organization must develop a program for the training of maintenance personnel at least every three years. The training must include human factors in maintenance and company maintenance documentation and procedures and where appropriate include technical components for aircraft and systems being maintained.

Common Control 1.8: Basic Aircraft Equipment Fit

Ensuring aircraft are fitted with the required minimum level of equipment suitable for the intended operations.

Aircraft basic equipment fit must meet the requirements listed in Appendix 2.

Common Control 1.9: Personnel Readiness

Ensuring mental health and well-being for all personnel is prioritised and assistance made available to assure fitness-for-work.

The aircraft operator must have a Well-being Policy and associated procedures that encourages personal well-being and resilience, whilst maintaining the risk of physical or mental health conditions developing into a safety concern for the individual or those around them. The Well-being Policy will offer opportunity to particpate in personal resilience training, Peer Support Programs (where available) and Employee Assistance Programs.

The aircraft operator must have a Drug and Alcohol Policy which meets all requirements of the responsible regulatory authority. Where no such regulatory requirements exist the operator must at a minimum meet the requirement of the contracting company.

Common Control 1.10: Flight Time Limits

Ensuring flight crew are alert and fit-to-fly the aircraft.

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

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

Common Control 1.11: Flight Crew Duty Time

Ensuring flight crew are not impacted by fatigue.

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.

Common Control 1.12: Maintenance Duty Time

Ensuring maintenance personnel are not impacted by fatigue.

The aircraft operator or approved maintenance organization must establish a fatigue management program to minimize the effects of acute and chronic fatigue amongst maintenance personnel. This must include maximum working hours, minimum rest periods and roster schedules. The requirement to conduct overnight maintenance must be reviewed by a Competent Aviation Specialist.

Common Control 1.13: Aircraft Operator Safety Management System

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

All aircraft operators must have a Safety Management System (SMS) that is fully integrated throughout and across each part of the organization.

Refer to the following information on SMS development:

ICAO Safety Management System

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

International Helicopter Safety Team – SMS Toolkit

Common Control 1.14: Accident and Incident Notification

Ensuring all events that impact safety or have the potential to impact safety, are reported appropriately.

As part of their SMS, the aircraft operator must advise the company of any incident, accident or non-standard occurrence related to the services provided to the company that has, or potentially has, disrupted operations or jeopardized safety.

Common Control 1.15: Operational Risk Assessment

Ensuring all risks associated with aircraft operations are analyzed, minimized and accepted.

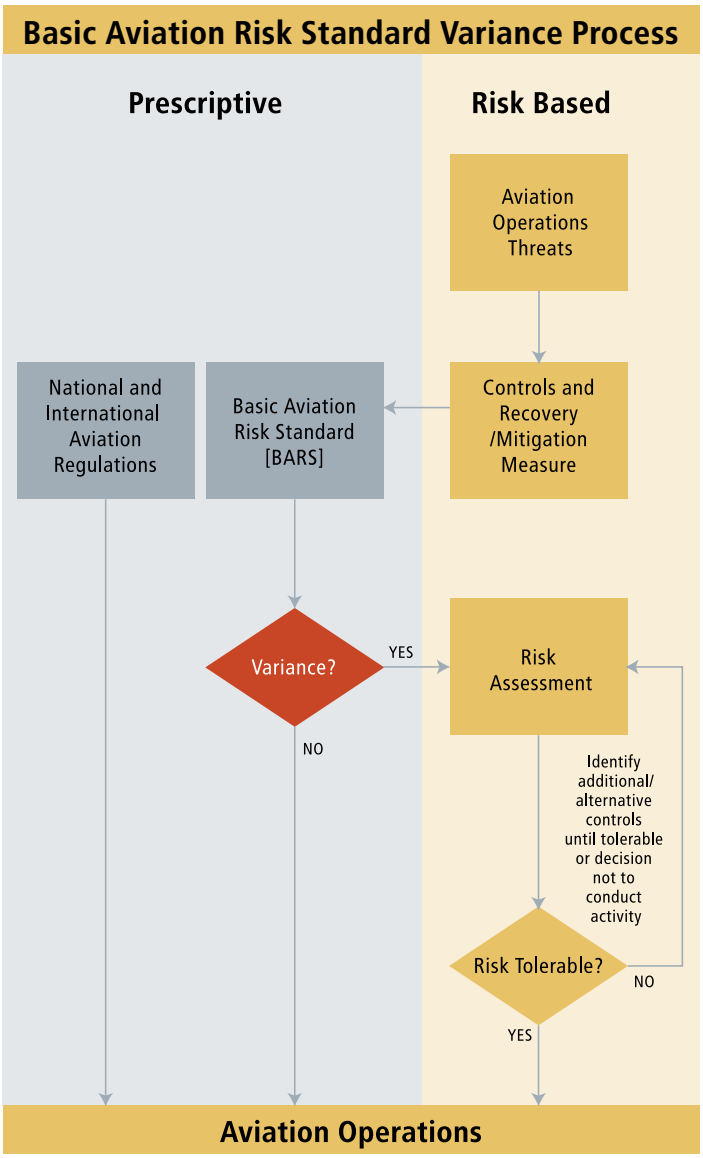
Aircraft operators must conduct a risk assessment, including mitigation controls, before commencing operations for any new or existing aviation activity.

Common Control 1.16: Sub-chartering Aircraft

Ensuring sub-chartered aircraft are operated in accordance with regulatory approvals and to a standard acceptable by the contracting company.

Sub-chartering (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 Air Operator's Certificate (AOC) they are operated under.

Figure 2: Variance Process.



Threat 2.0: Runway Excursions

An aircraft departs the runway during takeoff or on landing and this results in an accident

Control 2.1: Airfield and Helipad Design

Ensuring the physical design of airfields and helicopter landing sites, their markings, lighting, emergency cover and all ancillary systems are suitable for safe operations.

Where local guidance is unacceptable to the company, use ICAO Annex 14 Aerodromes, Volume I ('Aerodrome Design and Operation') and ICAO Annex 14, Volume II ('Heliports') for design considerations when constructing, or performing major rework, to permanent long-term company owned and operated airfields and helipads supporting operations.

Consider prevailing winds and the location of mining/facility infrastructure in relation to the proposed airfield or helipad departure and approach splays.

BARS Implementation Guidelines (BIG) Section D provides additional guidance for short-term or emergency use airfields whilst Section E provides additional guidance for helipad standards.

Control 2.2: Airfield Inspections

Ensuring airfields are appropriately maintained to assure safe operations.

In addition to reviews required by regulators, all company owned and/or operated airfields must have an annual operational review conducted by a company approved Competent Aviation Specialist.

Control 2.3: Landing Site Assessments

Ensuring effective risk assessment of landing sites to enable safe operations.

Aircraft operators must conduct landing site assessments prior to commencing operations. Incorporate the results into the operational risk assessment (Control 1.14).

Control 2.4: Balanced Field Length

Ensuring airfields are suitable for operations, including in the event of aircraft engine malfunctions.

All multi-engine aeroplanes must meet balanced field requirements where following an engine failure on takeoff, the aircraft can stop on the remaining runway and stop-way, or, using the remaining runway and clearway, climb and achieve a net climb gradient greater than the takeoff path obstacle gradient.

Control 2.5: Balanced Field Length – No Performance Charts

Ensuring that in the absence of aircraft performance information, airfields remain suitable for operations including in the event of aircraft engine malfunctions.

Multi-engine aeroplanes that do not have the appropriate Flight Manual performance charts to achieve Control 2.4 must restrict their payload so that in the event of an engine failure, the net takeoff path clears obstacles by 35 feet up to a height of 1500 feet above the aerodrome, using the following conditions.

The failure occurs:

- When the aeroplane has reached the published best Rate of Climb (V_Y) speed;
- With undercarriage up (if retractable);
- When the flaps are fully retracted; and
- With propeller on the inoperative engine feathered.

Threat 2.0 (cont.)

Control 2.6: Destination Weather Reporting

Ensuring flight crew receive accurate actual and forecast weather data to enable sound planning decisions.

For company owned and operated airfields and helidecks, communicate the following data to arriving aircraft by either an Automatic Weather Observation System (AWOS) and/or trained weather observer:

- Wind direction and speed;
- Temperature;
- Barometric pressure; and
- Cloud ceiling height and visibility.

Maintain all equipment on a current calibration register.

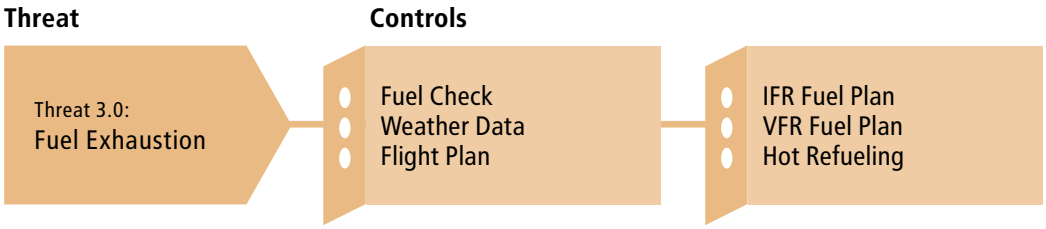
Control 2.7: Slope Guidance

Ensuring safety enhancement during the approach and landing phases of flight through the provision of accurate glideslope guidance to flight crew.

Install visual slope guidance on company owned and operated airfields.

Threat 3.0: Fuel Exhaustion

An aircraft conducts a forced landing or ditching as a result of fuel exhaustion and this results in an accident



Control 3.1: Fuel Check

Ensuring aircraft depart with sufficient fuel on-board to safely conduct the flight.

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 and during each flight stage.

Control 3.2: Flight Plan Weather Data

Ensuring accurate weather data is used when calculating aircraft routes and fuel requirements.

Provide the flight crew with access to reliable weather information when determining fuel loads in preflight planning.

Control 3.3: Flight Plan

Ensuring flights are subject to appropriate planning and highest possible notification requirements.

Flights must be conducted on an Instrument Flight Rules (IFR) flight plan lodged with the relevant air traffic control service provider. If this is not possible, Visual Flight Rules (VFR) flight plans are permitted but must be lodged with a responsible party (air traffic control service provider, aircraft operator or company site representative) and flown under a flight-following regime.

Control 3.4: Instrument Flight Rules (IFR) Fuel Plan

Ensuring sufficient fuel, including required reserves, is carried on IFR flights.

Fuel loads must cover:

- Trip fuel sufficient to cover fuel use during start-up, taxi, en route, holding, approach and transit to the alternate destination (if required);
- 30 minutes fixed reserve fuel; and
- Variable reserve fuel amounting to the higher amount of:
  - 10% of trip fuel to account for unforeseen circumstances; or
  - 5% of trip fuel plus contingency fuel to permit unpressurised or engine out operations at drift down altitude to the destination or alternate.

Control 3.5: Visual Flight Rules (VFR) Fuel Plan

Ensuring sufficient fuel, including required reserves, is carried on VFR flights.

Fuel loads must cover the planned route. Carry an additional variable reserve of 10% of the trip fuel and 30 minutes as fixed reserve.

Control 3.6: Hot Refueling

Ensuring hot refueling operations are used appropriately and conducted safely.

Hot refueling must only be conducted when considered operationally necessary and must be approved by the company prior to use. Hot refueling with gasoline and wide cut turbine fuel is prohibited. Aircraft operators must have a procedure on hot refueling which includes the following requirements:

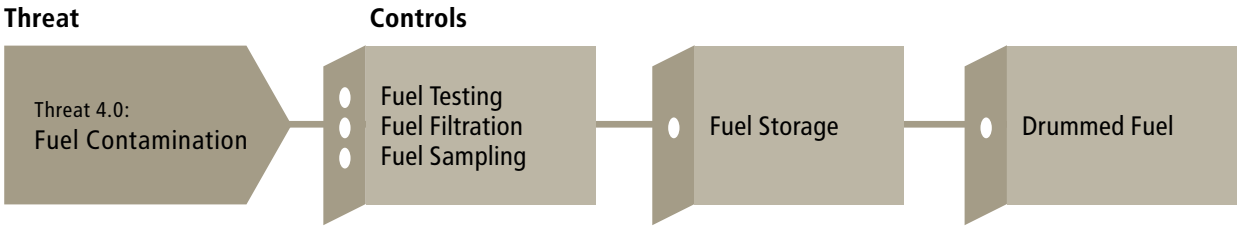
- No passengers are to be on-board during refueling unless the Pilot-in-Command assesses that it is safe to do so. In this scenario passengers must receive a safety brief prior to refueling. No side well-seats are to be occupied (e.g. Bell 212, 214, 412);
- Firefighting capability must be available and 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 (in addition to the pilot) required: a minimum of three for helicopter ops – one for refueling, one for pump shut-off and one for fireguard;
- Radios are not to be used during refueling;
- Prior to removing the fuel cap and inserting the fuel nozzle or connecting the pressure hose into the aircraft fuel tank, grounding wires running from the fuel station and from the fuel hose to the aircraft must be connected;
- When refueling is completed, the Pilot-in-Command 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 aeroplanes with engines operating must not be conducted in normal circumstances and only if the APU is inoperative. An APU running without engines operating does not constitute hot refueling and is acceptable.

Refueling aeroplanes with engines operating must not be conducted unless a specific procedure has been approved by the aircraft manufacturer and regulator and is further supported with documented training of both flight and ground crew. Personnel manning firefighting equipment must be present during the activity.

Threat 4.0: Fuel Contamination

An aircraft is forced to land at unprepared sites with minimal warning due to contaminated fuel and this causes a loss of engine power and an accident



Control 4.1: Fuel Testing

Ensuring the fuel on-board prior to flight is the correct type and grade and free of contamination.

When testing the fuel supplied use water detector capsules or an equivalent that is able to test for water in suspension. The Pilot-in-Command must verify that the quality of the fuel being uplifted is acceptable for operation of the aircraft.

Control 4.2: Fuel Filtration

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

Equip fuel delivery systems including portable systems with water blocking filtration of the Go/No-Go types. Mark filter canisters with the next date of change or inspection cycle. Replace all filters at least annually or at nominated pressure differentials as annotated on the filter housing or as recommended by the manufacturer.

Where fuel is being provided by a recognized supplier 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.

Control 4.3: Fuel Sampling

Ensuring samples of tested fuel are retained appropriately.

When installing supply fuel tanks at company owned and operated facilities, a slope at the base with a sump drain at the tank low point (or equivalent) for sampling purposes must be specified for installation.

When using a dedicated fuel source, a sample from the source must be retained in a clear jar with screw-top-lid, labeled with the current date and retained until completion of the daily flying activities.

Control 4.4: Fuel Storage

Ensuring fuel is stored in a manner that will prevent contamination.

Prior to testing and approving for use, all fuel storage facilities must be allowed to settle one hour per one foot of fuel depth (or three hours per meter) after the tanks have been resupplied. Additional storage requirements include:

- Storage tanks must have floating suction or minimum standpipe;
- Bulk deliveries must be filtered into storage tanks;
- Fuel systems must be identified by 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.

Where fuel is being provided by a recognized supplier 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.

Control 4.5: Drummed Fuel

Ensuring drummed fuel is handled in a manner that will not compromise fuel quality.

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

Quality:

- Fuel must be consumed within its Aviation Release Note certification date;*
- 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;
- Before fueling the aircraft, a small amount of fuel must be pumped into a container to remove any contaminants from the hose and nozzle; and
- All drum pumps, spears, and hoses must be sealed when not in use to protect from ingress of dust and contaminents. Seals must be non-porous and secure.

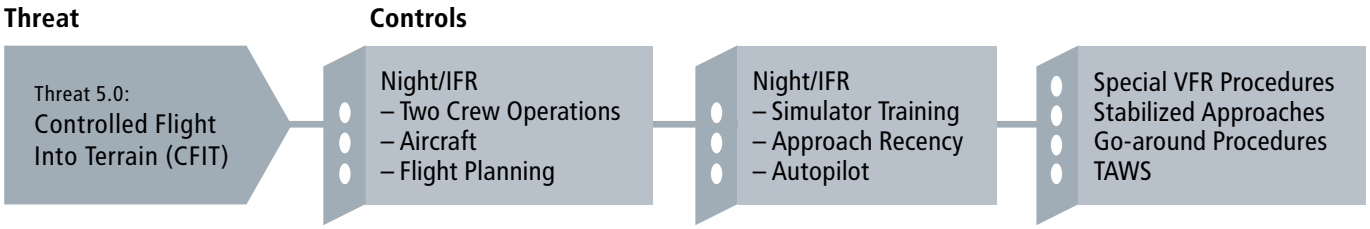
To provide optimum opportunity for any contaminants to settle, drums must be brought to the vertical three hours prior to testing. Where this is not practical (e.g. SAR, Emergency Response, etc.) all performance requirements of this control must be followed.

*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 on stock.

Courtesy: Skyhorse Aviation

Threat 5.0: Controlled Flight Into Terrain (CFIT)

An airworthy aircraft under the control of crew is flown into the ground (or water) resulting in an accident



Control 5.1: Night or Instrument Flight Rules (IFR) – Two Crew Operations

Ensuring effective and safe operations in night and IFR conditions.

Flights flown at night or in IFR must have two-pilots who hold valid and current instrument and night flying ratings using Standard Operating Procedures (SOPs) contained in the Operations Manual. Refer to the FSF ALAR Toolkit (www.flightsafety.org).

Control 5.2: Special VFR Procedures

Ensuring Special VFR procedures are only used when authorized.

Planned use of Special VFR procedures must only be used when endorsed by a Competent Aviation Specialist.

Control 5.3: Night or IFR – Aircraft

Ensuring safety and redundancy for night and IFR flights.

Flights flown at night or under IFR must be conducted in a multi-engine aircraft.

Control 5.4: Night or IFR – Flight Planning

Ensuring appropriate planning for the safety of night or IFR flights.

Flights flown at night or under IFR must be conducted in compliance with an IFR flight plan.

Control 5.5: Night or IFR – Simulator Training

Ensuring high quality training of flight crew in a benign environment.

For long-term contracts, crews operating any aircraft at night or under IFR must attend initial and recurrent simulator training. Flight Training Devices may be used when they are available for that aircraft type.

Control 5.6: Night or IFR – Approach/Landing Recency

Ensuring that flight crew have appropriate recent experience for safe night and IFR operations.

IFR and night approach recency must comply with the responsible regulatory authority's requirements, but not include less than three night takeoff and landings for each pilot in the preceding 90 days.

Control 5.7: Night or IFR – Autopilot

Ensuring the maintenance of controlled flight is enhanced by the use of automation.

An Autopilot or AFCS must be fitted for night or IFR flights.

Control 5.8: Stabilized Approaches

Ensuring that all approaches are within recognized predefined safety margins.

Aircraft operators must include type-specific stabilized approach requirements in the Operations Manual. Refer to the Flight Safety Foundation ALAR Briefing Note 7.1 (www.flightsafety.org).

Control 5.9: Mandatory Go-around Procedures

Ensuring safe outcomes for unstabilized approaches.

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

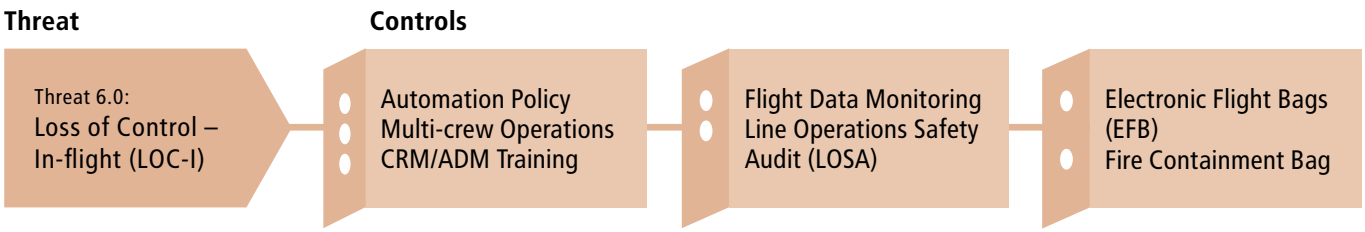
Control 5.10: Terrain Awareness Warning Systems (TAWS)

Ensuring the accurate detection of terrain and adjacent obstacles so as to allow timely corrective action if necessary.

Aircraft that fly under IFR or at night and on long-term contract must be fitted with an approved and serviceable Class A TAWS when an approved modification exists for the aircraft type. The aircraft operator must have related procedures to be followed by the flight crew in the event of an alert.

Threat 6.0: Loss of Control – In-flight (LOC-I)

Crew actions inadvertently place the aircraft outside the normal flight envelope or the intended flight path and lead to an unrecoverable flight situation



Control 6.1: Automation Policy

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

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

Control 6.2: Multi-crew Operations

Ensuring clearly defined procedures for the safe conduct of multi-crew operations.

Where multi-crew operations are conducted, procedures outlining the duties and responsibilities of all flight crew members must be prescribed by the aircraft operator.

Control 6.3: CRM/ADM Training

Ensuring flight crew are trained and proficient in the effective use of all resources for the safe conduct of flight.

All flight crew and cabin 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.

Control 6.4: Flight Data Monitoring

Provision of accurate and timely feedback to flight crew via a monitoring program.

When available for the aircraft type, designated aircraft on long-term contracts must have Flight Data Monitoring capability routinely used to assess operational performance.

Control 6.5: Line Operations Safety Audit (LOSA)

Provision of a feedback system to the company of the effectiveness of the CRM, training program and TEM capabilities of the pilot population in their operating environment.

For long-term contracts greater than two years, the aircraft operator must have a LOSA program as part of its SMS. This must be a structured program, using trained observers to collect data on routine flights, on a de-identified non-punitive basis, on flight crew response to threats and errors. Use of systems that use video and other data capture techniques may be used for single-pilot and/or small aircraft operations where carrying an external observer is not considered practical. The data must be analyzed and appropriate action plans implemented.

The LOSA program need not involve observations of the contracted operation if an appropriate sample is taken of comparable operations (e.g. fixed wing flights to a mine site with similar aircraft types, flying to similar procedures in a similar environment.) The LOSA observations may be conducted periodically, but at least every two years.

See *Flight Safety Digest* Volume 24 No 2, Feb 2005.

Control 6.6: Electronic Flight Bags (EFB)

Ensuring use of EFBs is conducted in a safe manner that positively contributes to the overall management of the flight.

If the aircraft operator makes use of EFBs in the cockpit, a Standard Operating Procedure covering all intended applications and any safety-related restrictions must be developed and approved in accordance with ICAO Doc 10020 manual of Electronic Flight Bags (EFBs) or local regulatory equivalent (such as Advisory Circular AC 120-76D) for the EFB type being used.

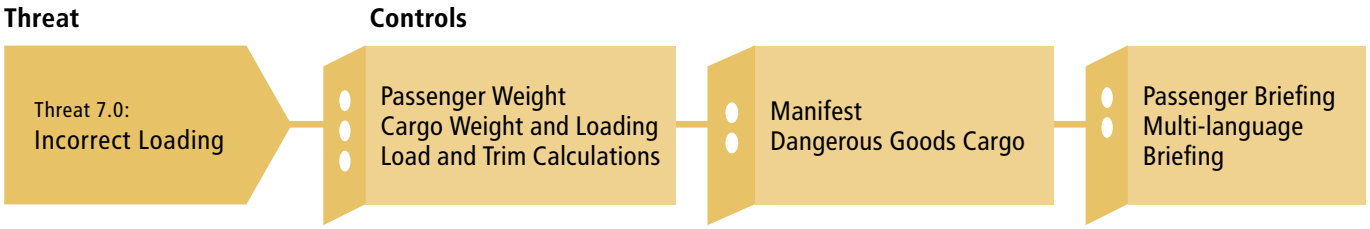
Control 6.7: Fire Containment Bag

Ensuring an in-flight lithium battery fire generated inside the cockpit or cabin is contained before combustion results in loss of control.

If any Personal Electronic Devices (PEDs) or Electronic Flight Bags (EFBs) are carried in the cockpit or cabin, a Fire Containment Bag must be accessible in-flight. The Fire Containment Bag must be of sufficient size to cater for the largest item carried, and all crew members, including cabin attendants, must have received training in the safe capture of burning devices using the bag.

Threat 7.0: Incorrect Loading

Incorrect loading of passengers and/or their lack of proper safety awareness results in an aircraft accident



Control 7.1: Passenger Weight

Ensuring accurate passenger weights are utilized in load calculations, appropriate to the type of aircraft.

For aeroplanes with less than 30 passenger seats and for all helicopters, actual body weight (including hand luggage) must be used.

Standard weights based on seasonal averages may be used for aeroplanes with 30 passenger seats or more if within regulatory or operator requirements.

Control 7.2: Cargo Weight and Loading

Ensuring aircraft loads are accurately weighed, manifested, appropriately positioned and secured.

Weigh baggage and cargo separately and include details on the manifest.

If cargo is carried inside the passenger compartment during passenger carrying operations, secure it using nets and straps and place it in front of the passengers where practical. Do not obstruct normal or emergency exits.

Control 7.3: Load and Trim Calculations

Ensuring accurate and safe aircraft loading within approved limits.

Prior to takeoff, the Pilot-in-Command must ensure that fuel and oil requirements are correct, and that weight and center of gravity limits of the aircraft have been calculated and are within limits for flight. The Load and Trim calculations may be accomplished by any approved means, but the details must be available in the cockpit at all times.

Control 7.4: Manifest

Ensuring accurate passenger manifests are appropriately retained.

A passenger manifest that accurately reflects the occupants of an aircraft must be raised for each flight or, where applicable, each sector. The manifest must record the full name of each passenger and a copy must be accessible by flight following personnel at all times.

Control 7.5: Dangerous Goods Cargo (Hazardous Materials)

Ensuring only appropriately packaged and documented DG is carried in aircraft and is handled by trained and current personnel.

Comply with current International Air Transport Association (IATA) requirements (or similar requirements such as Title 49 of the Code of Federal Regulations) associated with Dangerous Goods Regulations. The aircraft operator must have appropriate procedures and trained personnel for the carriage and acceptance of dangerous goods. All crew must complete dangerous goods awareness training at least every two years.

Control 7.6: Passenger Briefing

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

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

- That there is no smoking during the flight or around the aircraft and apron area;
- A general description of the aircraft and specific avoid/danger areas;
- The location of non-smoking and fasten seatbelt signs and briefing cards;
- The use of seat belts and shoulder harnesses;
- The location and operation of oxygen masks, if applicable;
- The means of communication between crew and passengers;
- The brace position;
- The location and use of normal and emergency exits and all life-saving equipment; and
- Instructions on the use of Personal Electronic Devices (PEDs).

Passengers must be briefed after any sudden descent, return to base, or any other event that may cause concern.

Control 7.7: Multi-language Briefing

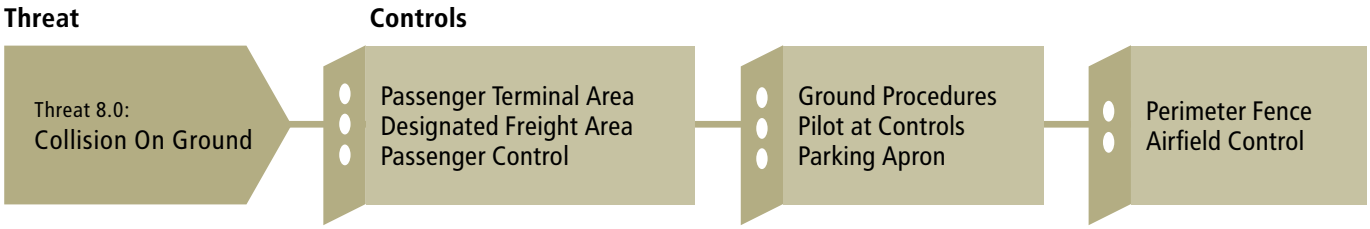
Ensuring that all passengers fully comprehend the safety briefings and safety features of the aircraft.

When the first language in the area of operations is not English, the aircraft operator must provide emergency exit decals and briefings in the local language as well as English.

Courtesy: Karratha Flying Services

Threat 8.0: Collision on Ground

An aircraft and an object collide on the ground resulting in an accident



Control 8.1: Passenger Terminal Area

Ensuring aircraft passengers are safe and secure when not embarked in the aircraft.

Company owned and operated airfields must have a waiting area for passengers offering security, basic amenities, protection from the elements and a barrier from the aircraft movement area. Incoming and outgoing passenger routes must be designated.

Control 8.2: Designated Freight Area

Ensuring aircraft cargo is kept safe and secure prior to loading.

Company owned and operated airfields, helipads and helidecks must have a designated and secure freight area that provides a controlled environment clear of the aircraft movement area and public thoroughfare.

Control 8.3: Passenger Control

Ensuring passengers are kept clear of known hazard areas during embarkation and disembarkation.

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 if they are not a crew member of the aircraft.

Control 8.4: Ground Procedures

Ensuring safe maneuvering of aircraft when on the ground.

The Operations Manual must include requirements on ground handling and the maneuvering of aircraft.

Control 8.5: Pilot at Controls

Ensuring safety of all personnel in the vicinity of aircraft under power on the ground.

A pilot must remain at the controls of an operating aircraft under power and whilst on the ground at all times.
The controls must not be left unattended with the aircraft under power in any circumstances, even to assist in activities such as hot refueling, load attachment or passenger management. The transfer of passengers whilst the rotors are running for helicopter operations must be supervised by a designated PCO or HLO.

Control 8.6: Parking Apron

Ensuring the physical characteristics of the parking apron support safe aircraft operations and deconflict aircraft movements.

For all company owned and operated airfields, 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 operations where practical, taxi lines specific to the contracted aircraft type must be painted in the apron area for obstacle-clearance maneuvering purposes.

Control 8.7: Perimeter Fence

Ensuring security of airfields and landing areas.

Construct a perimeter fence around all company owned and operated airfields to prevent access by livestock, other animals and traveling pedestrians.

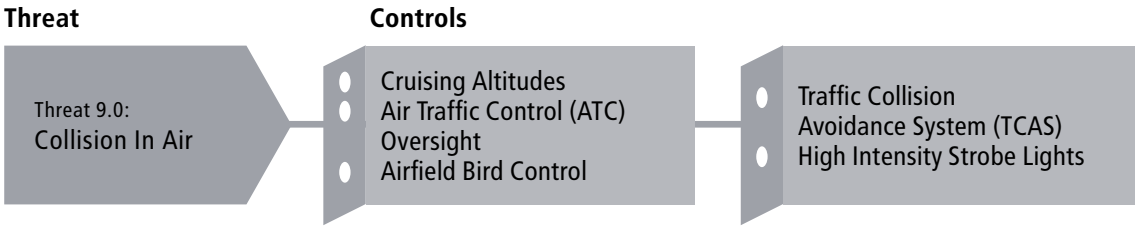
Control 8.8: Airfield Control

Ensuring airfields are operated in accordance with certification requirements by qualified personnel.

All company owned and operated airfields must have personnel who are responsible for overseeing and managing the airfield and operating standards. Responsibilities include having a basic understanding of the local aviation regulatory system, certification requirements of the airfield and daily airfield reporting officer duties.

Threat 9.0: Collision in Air

An aircraft and object collide in air resulting in an accident



Control 9.1: Cruising Altitudes

Ensuring appropriate vertical clearance from other aircraft and known bird activity.

Comply with the ICAO cruising altitudes for both VFR and IFR flight unless circumstances, such as weather, require non-standard procedures. Where known bird migratory routes are identified, make practical attempts to plan cruise altitudes above 3,000 feet above ground level.

Control 9.2: Air Traffic Control (ATC) Oversight

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

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

Control 9.3: Airfield Bird Control

Ensuring that the probability of bird strikes to aircraft in the vicinity of airfields is minimized.

Conduct active bird control at all company owned and operated airfields when required and record the presence of birds periodically. Where possible, birds must be dispersed or removed in accordance with local wildlife regulations. Seeding grass, open waste disposal and water ponds must be restricted to remove attractions for birds.

Where bird activity exists, aircraft operators must minimize the risk of bird strike during all operations.

Control 9.4: Traffic Collision Avoidance System (TCAS)

Ensuring timely detection of conflicting air traffic to enable correct avoidance maneuvers and avoidance of other traffic.

Aircraft capable of being flown at night, under the IFR and on long-term contract must be fitted with a TCAS. The aircraft operator must have a procedure describing the action to be taken for TCAS advisories.

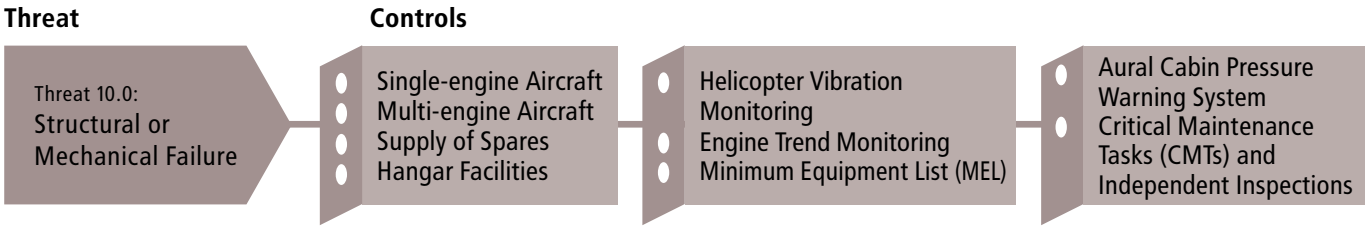
Control 9.5: High Intensity Strobe Lights

Ensuring aircraft are conspicuous to all other traffic.

Aircraft on long-term contract operating in airspace without radar coverage and where the potential for conflicting traffic is assessed as being high, must have high intensity strobe or pulse lights fitted when approved for the aircraft type.

Threat 10.0: Structural or Mechanical Failure

Structural or mechanical failure of the aircraft results in loss of control and an accident



Control 10.1: Single-engine Aircraft

Ensuring the safety of occupants in the event of engine failure and subsequent forced landing.

Single-engine aircraft must only be used for passenger flights in a non-hostile environment under day visual conditions.

All single-engine aircraft used for passenger carrying operations must have turbine engines.

Control 10.2: Multi-engine Aircraft

Ensuring the safety of occupants in the event of engine failure.

Multi-engine aircraft capable of sustaining a 1% net climb gradient above the route lowest safe altitude, or 500 feet above the terrain in the area of operations, with One Engine Inoperative (OEI), must be used if:

- Operating in a hostile environment and carrying passengers;
- Any portion of the flight will be in instrument (non-visual) night conditions; and/or
- Operating on extended over water flights.

Control 10.3: Supply of Spares

Ensuring provision of genuine, serviceable parts.

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

Control 10.4: Hangar Facilities

Ensuring facilities are conducive to sound maintenance practice, including the provision of emergency equipment.

Hangar facilities that are suitable for the activities being performed must be accessible for aircraft operating on all long-term contracts. Long-term field operations, particularly in high rainfall, arctic or desert environments, must have sheltered arrangements for scheduled and non-scheduled field aircraft servicing.

Permanent hangars must be fitted with fire extinguishers and fire alarms which are regularly tested in accordance with fire regulations. Records of such tests must be made available upon request.

Control 10.5: Helicopter Vibration Monitoring

Ensuring the early detection of impending failures in helicopter transmission systems to facilitate timely corrective action.

Helicopters on long-term contract must have a plan endorsed by a Competent Aviation Specialist to fit a Health Usage Monitoring System (HUMS) or airframe and engine Vibration Monitoring System (VMS), where systems have been developed and approved for the helicopter type. The aircraft operator must follow procedures to routinely download and analyze data.

Control 10.6: Engine Trend Monitoring

Ensuring the early detection of impending failures in engine systems to facilitate timely corrective action.

All single-engine turbine aircraft on long-term contract must fit an automatic electronic engine trend monitoring system when available for the aircraft type. The aircraft operator must follow procedures to routinely download and analyze engine trend data.

Control 10.7: Minimum Equipment List (MEL)

Ensuring clear guidance for the safe operation of the aircraft with inoperative equipment prior to dispatch by use of approved procedures.

Aircraft operators must develop a MEL for all aircraft on long-term contracts. All equipment installed on an aircraft must be operational, unless it is operated in accordance with an approved MEL or approved by the appropriate civil aviation authority under an established program for deferred defects.

Control 10.8: Aural Cabin Pressure Warning System

Ensuring clear warning of aircraft pressurization failure.

Where approved for the aircraft type and permitted by the National Aviation Authority, all pressurized aircraft must be equipped with an aural cabin pressure warning system in addition to any visual cabin pressure warning system.

Control 10.9: Critical Maintenance Tasks (CMTs) and Independent Inspections

Ensuring maintenance tasks that are critical to the safety of flight are managed with additional independent scrutiny.

Maintenance tasks that involve assembly or disturbance of any system that may affect the 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.

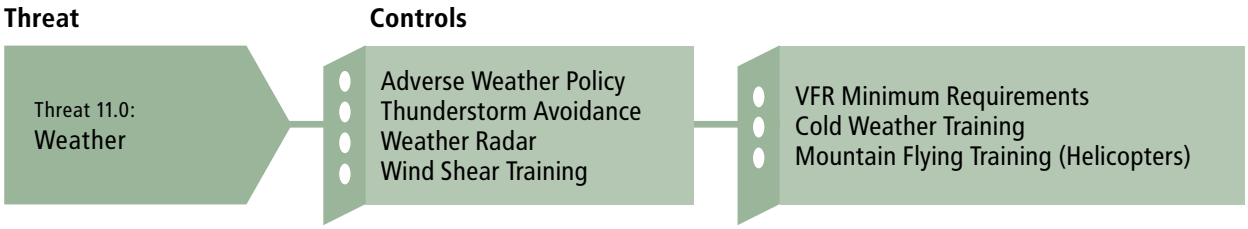
CMTs must be clearly identified in maintenance worksheets or job cards.

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.

Courtesy: Nautilus Aviation

Threat 11.0: Weather

Weather conditions force an aircraft to deviate from its original flight path causing an accident



Control 11.1: Adverse Weather Policy

Establishing weather limitations consistent with the capabilities of the aircraft and the available rescue assets, are applied to each flight.

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 normal operations. Situations can include: excessive wind over helidecks prohibiting personnel movement to and from the helicopter, excessive sea state preventing an effective offshore search and rescue capability, 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.

Control 11.2: Thunderstorm Avoidance

Ensuring safe operations in the vicinity of thunderstorms.

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

Control 11.3: 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 a serviceable weather radar. 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.

Control 11.4: Wind Shear Training

Ensuring flight crew are provided with regular training to enable safe operations in the event of wind shear phenomenon.

Flight crew operating aeroplanes on long-term contract must have ongoing training addressing the identification and recovery measures associated with microburst and wind shear phenomenon.

Control 11.5: VFR Minimum Requirements

Ensuring aircraft are operated safely when utilizing Visual Flight Rules especially in dynamic or marginal environments.

Aircraft operating under VFR must be flown in accordance with the minimum local regulatory requirements for flight under the VFR for departure, en route and destination legs. Local Standard Operating Procedures must be developed for areas such as mountainous jungle operations, where rapidly changing VFR conditions can be common.

Control 11.6: Cold Weather Training

Ensuring flight crew are appropriately trained for the safe operation of aircraft in cold weather environments.

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;
- Anti-icing and de-icing including use of holdover time tables;
- In-flight icing and associated hazards;
- Cold weather operational takeoff, approach and landing; and
- Runway visibility, contamination and performance considerations.

Free online courses addressing the above include NASA aircraft on-line icing courses (http://aircrafticing.grc.nasa.gov/).

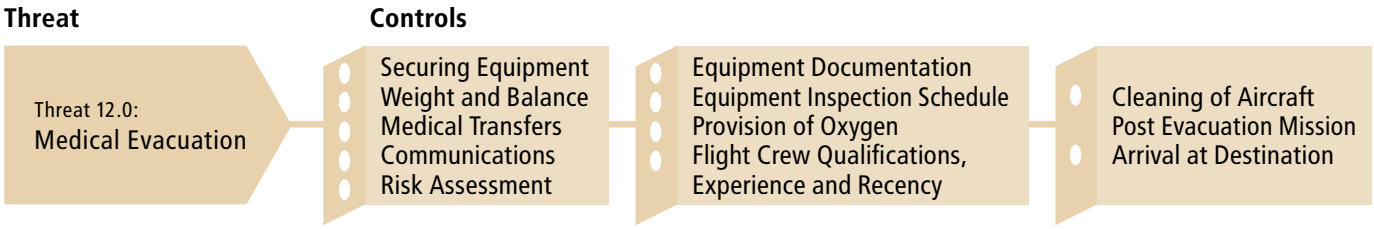
Control 11.7: Mountain Flying Training (Helicopters)

Ensuring helicopter Flight Crew have sufficient training when operating in a mountainous environment.

Helicopter operators must ensure any pilot operating in a mountainous area has completed a mountain flying course to the satisfaction of the Head of Flight Operations. The course must meet or exceed both the ground and flying syllabus outlined in the Helicopter Association of Canada Mountain Flying Training Best Practice version 1.1 dated August 2012.

Threat 12.0: Medical Evacuation

In addition to the Controls and Defences detailed in this Standard, the following requirements apply to Medical Evacuation (Medevac) flights



Control 12.1: Securing of Medical Equipment

Ensuring role equipment is secured appropriately in the aircraft.

The aircraft operator must have a procedure that outlines the methodology associated with securing medical equipment in aircraft.

Control 12.2: Weight and Balance

Ensuring role equipment is accounted for in the weight and balance calculations.

The aircraft operator must ensure that the weight and balance calculations accurately account for stretcher carrying operations.

Control 12.3: Medical Transfers

Ensuring preflight planning and aircraft systems provide the maximum possible level of care to patients.

The aircraft operator must have a procedure for operating aircraft at Sea Level cabin pressure for medical transfers when required.

Control: 12.4: Communications

Ensuring clear communications between flight crew and medical staff in the aircraft.

The aircraft operator must have the capability (such as headsets) to allow communications between the medical team and the pilots for each aircraft type considered.

Control 12.5: 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 medical evacuation is separated from the safety-of-flight decision-making process.

Control 12.6: Equipment Documentation

Ensuring medevac equipment is appropriately certified for use.

The aircraft operator must have appropriate documentation, such as Supplemental Type Certificates (STC), for all medical equipment attached to the aircraft.

Control 12.7: Equipment Inspection Schedule

Ensuring early detection of impending failure of medical equipment.

All medical equipment (including oxygen cylinders) that are capable of being attached to the aircraft must be on an inspection schedule to determine serviceability.

Control 12.8: Provision of Oxygen

Ensuring patient oxygen systems are properly certified and tested.

The aircraft operator must have a procedure that ensures any oxygen cylinders are filled to manufacturer specifications. Where oxygen cylinders are permanently fitted to stretcher systems they must undergo regular hydrostatic testing in accordance with manufacturer specifications.

Control 12.9: Flight Crew Qualifications, Experience and Recency

Ensuring flight crew are competent to conduct medevac operations by having appropriate training, qualifications and experience.

Comply with the requirements listed in Appendix 1.

Threat 12.0 (cont.)

Control 12.10: Cleaning of Aircraft Post Evacuation Mission

Ensuring protection of personnel on-board the aircraft from exposure to contaminated surfaces.

Post mission, the aircraft must be cleaned thoroughly, and if this happens at night time, the task must not be commenced until sufficient lighting in the cabin has been arranged.

Control 12.11: Arrival at Destination (Destination Arrival or Transit Planning)

Ensuring ground services are ready and capable for onward transport of the patient(s).

Medevac planning must consider and coordinate with the operator, the destination arrival or intermediate transit procedures to include ground ambulance arrangements, bed-to-bed or tarmac access considerations.

Defences 19.0: Aircraft Accident

Mitigating defences in the event of an aircraft accident

Defence 19.1: Aircraft Certification Standards

Ensuring the aircraft crashworthiness capability is appropriate.

Aircraft designed to the latest certification standards have increased crashworthiness and survivability characteristics when compared to those aircraft certified to older standards. Consider the certification standard when selecting aircraft for all long-term contracts.

Defence 19.2: Emergency Response Plan

Ensuring adequate and appropriate SAR or emergency response procedures are up to date and tested.

All aircraft operations (including company owned or operated airports) 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.

The ERP must be exercised annually for all long-term operations and include a bridging document detailing lines of communications between the company and aircraft operator.

Defence 19.3: Emergency Locator Transmitter

Ensuring timely alerting and location identification to aid SAR services.

An Emergency Locator Transmitter (ELT) meeting the requirements of Technical Standard Order (TSO) 126 (406MHz) or equivalent must be fitted to all contracted aircraft. The responsible party noted on ELT registration as the primary contact is also to be detailed in the aircraft operator's Emergency Response Plan.

Defence 19.4: Satellite Flight Following

Ensuring that the location of aircraft during normal and emergency situations is known at all times.

All aircraft on long-term contract operating in hostile environments must be fitted with satellite flight following systems. 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. The system components must include: a cockpit distress function with corresponding audio at the base station, cockpit indication of functionality, satellite telephone with text back-up, internet-based monitoring system and the ability to adjust reporting intervals based on altitude.

Defence 19.5: Flight Following

Ensuring that the location of aircraft during normal and emergency situations is known, even when not subject to air traffic control procedures.

Where flights are conducted outside of controlled airspace or are not subject to any form of position reporting, the aircraft operator in conjunction with the company 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.

Defence 19.6: Survival Kit

Ensuring that in the event of an emergency, aircraft occupants have access to suitable equipment and supplies to aid survival in the geographical environment.

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

Defence 19.7: Flight Crew PLB

Ensuring timely alerting and location identification to aid SAR services.

Flight Crew operating helicopters in hostile environments must have access to a Personal Locator Beacon (PLB) that is either voice-capable or is accompanied with a satellite phone.

Defence 19.8: First-Aid Kit

Ensuring that in the event of an emergency, aircraft occupants have access to medical equipment.

At least one first-aid kit must be carried on all aircraft.

Defences 19.0 (cont.)

Defence 19.9: Passenger Dress Requirements

Ensuring that passengers wear protective clothing appropriate to the operating conditions and environment.

Passengers must wear clothing and footwear appropriate to the environment being flown over regardless of the flight duration.

With the exception of hard hats with chin straps, the wearing of caps and other headgear of any type in and around helicopters is prohibited. This does not apply to flight crew members inside the cockpit, conducting an aircraft inspection with rotors stopped or during rotors running with the cap secured by communication headset.

Defence 19.10: Cockpit Voice Recorder (CVR)/ Flight Data Recorder (FDR)

Ensuring appropriate equipment is fitted to an aircraft to aid in accident investigation and prevention.

Aircraft on long-term contract and certificated with a seating capacity of more than nine passenger seats shall be fitted with a Cockpit Voice Recorder and Flight Data Recorder when available for the aircraft type.

Defence 19.11: Upper Torso Restraint

Ensuring aircraft occupants survive a crash impact.

All helicopter and single-engine aeroplane crew and passenger seats must be fitted with upper torso restraints and be worn at all times.

The use of seat belt extensions that interfere with the full effectiveness of the upper torso restraint is prohibited.

Defence 19.12: Limitations in Sideways Seating

Ensuring aircraft occupants survive a crash impact.

Sidewards facing seats must be avoided during takeoff and landing, unless regulatory approved shoulder restraints are used and passengers are briefed on the importance of their use accordingly.

Defence 19.13: Crash Boxes

Ensuring that in the event of an accident, emergency response teams have access to suitable equipment.

Company owned and operated landing sites supporting long-term operations must have a crash box accessible to personnel at the airfield or primary helipad.

Defence 19.14: First Response to Aircraft Incident on Airfield

Ensuring adequate 'rapid' emergency response is available on the airfield in a timely and adequately resourced manner.

All company owned or operated helipads or airfields must have an on-site means of providing a first response capability commensurate with the potential risk. The first response capability is aimed at suppressing development of fire to allow personnel time to exit the aircraft. Personnel must receive training on the equipment provided.

Defence 19.15: Insurance

Ensuring business continuity for the contracted providers.

It is the responsibility of the contracting company to determine the level of insurance required in accordance with company risk management standards.

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 additional insured under the contract.

Defence 19.16: Post Event Management

Ensuring post-event protocols are established to assist safe resumption of activities.

The aircraft operator must have a process clearly outlining a safe resumption of services following a reportable event. This process should include (but not be limited to), ensuring flight crew well being and fitness-for-work, aircraft contiunuing airworthiness assurance and any role-specific activities (such as external loads) are all being conducted in accordance with expectations.

Courtesy: Skyhorse Aviation

Appendices

Appendix 1:

Flight Crew Qualifications, Experience and Recency

Pilot-in-Command – Aeroplanes and Helicopters

Qualifications	>5700 kg Multi-engine	5700 kg and below Multi-engine[1]	Single-engine
Licence	ATPL	CPL[5]	CPL
Instrument Rating[2]	Command, multi-engine	Command, multi-engine	Not required
Experience[3]			
Total Hours	3000	2500	2000
Total Command	2500	1500	1500
Total Command Multi-engine	500	500	N/A
Total Command on Type	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 – Aeroplanes and Helicopters

Qualifications	>5700 kg Multi-engine	<5700 kg Multi-engine	Single-engine
Licence	CPL	CPL	CPL
Instrument Rating[2]	Command	Co-pilot	
Experience[3]			
Total Hours	500	250	250
Total Multi-engine	100	50	
Total on Type	50	10	10

Both Pilot-in-Command and Co-pilot – Aeroplanes and Helicopters

Recency	
Total Hours previous 90 days[4]	50 hours, ten on the aircraft type
Night recency previous 90 days	Three night takeoffs and landings
CRM/ADM initial and refresher	Every two years
Dangerous Goods Awareness	Every two years
Accident and Violation Record	Two years accident free for human error causes, subject to review by the company

Maintenance Personnel – Aeroplanes and Helicopters

Qualifications	Chief Engineer	Line Engineer
Total time on Aeroplanes/Helicopters (whichever applicable)	Five years	Two years
Engine/Airframe/Avionics Rating (where appropriate)	Yes	Yes
Accident and Violation Record	Two years accident free for human error causes, subject to review by the company	

(1) Includes the following type series: King Air 300, Twin Otter, Beech 1900, CASA 212, Metro III/23, Dornier 228 and Let 410.
(2) 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.
(3) Competency-Based Training (CBT) reviewed and endorsed by a Competent Aviation Specialist may be used.
(4) If not met, a non-revenue check-flight by a qualified company check pilot is required.
(5) Some regulatory authorities may require the PIC to hold an ATPL for multi-crew operations.

Appendix 2:

Basic Aircraft Equipment Fit

Helicopters and Aeroplanes

<table>
<tr><th>Equipment</th><th>Multi-engine</th><th>Single-engine</th></tr>
<tr><td>Two VHF Transceivers</td><td colspan="2" rowspan="10">Required</td></tr>
<tr><td>One HF Transceiver, if VHF coverage is not available for the entire area</td></tr>
<tr><td>Mode C or S Transponder</td></tr>
<tr><td>TSO 126 ELT</td></tr>
<tr><td>GPS (IFR TSO required for night or IFR operations)</td></tr>
<tr><td>Upper Torso Restraints (Helicopter and SE Aeroplane only)</td></tr>
<tr><td>First-Aid Kit</td></tr>
<tr><td>One Fire Extinguisher</td></tr>
<tr><td>Survival Equipment, tailored to environment</td></tr>
<tr><td>Automatic Electronic Engine Trend Monitoring – required for single-engine aircraft on long-term contract</td></tr>
<tr><td>Fixed or portable electronic CO detection capability with a functioning audio alert for all piston engine fixed wing aircraft</td></tr>
<tr><td>Internal PA system or effective ability to communicate with passengers</td><td colspan="2" rowspan="2">Required for passenger carrying operations</td></tr>
<tr><td>Passenger Briefing Cards</td></tr>
<tr><td>Autopilot or AFCS[1]</td><td rowspan="6">Required IFR or Night</td><td rowspan="15">Optional</td></tr>
<tr><td>Two ADF, if NDB approach is only approved instrument approach available</td></tr>
<tr><td>Two VOR/ILS</td></tr>
<tr><td>VSI</td></tr>
<tr><td>Radio Altimeter with audio and visual alert</td></tr>
<tr><td>Color Weather Radar</td></tr>
<tr><td>TCAS I – Rotary Wing</td><td rowspan="11">Required for dedicated long-term contracts</td></tr>
<tr><td>TCAS II – Fixed Wing</td></tr>
<tr><td>TAWS</td></tr>
<tr><td>Satellite Flight Following (hostile environment)</td></tr>
<tr><td>CVR/FDR, or as required by local CAA (>9 passenger seats)</td></tr>
<tr><td>HUMS, UMS or VMS</td></tr>
<tr><td>FDM</td></tr>
<tr><td>Automatic Dependent Surveillance - Broadcast (ADS-B)</td></tr>
<tr><td>Performance based navigation system where ground based navigation systems do not provide approach capability</td></tr>
<tr><td>High Visibility Pulse Lights – in areas of traffic</td></tr>
<tr><td>External Mirrors for situational awareness (helicopters only)</td><td colspan="2">Optional</td></tr>
</table>

(1) The following twin engine aircraft are exempt from this requirement: DHC-6 Twin Otter, Beech 99, Beech 1900, Beech King Air 90/100/200, Embraer Bandeirante, Fairchild Swearingen Metro III/IV, Let 410 and Jetstream J31/32.

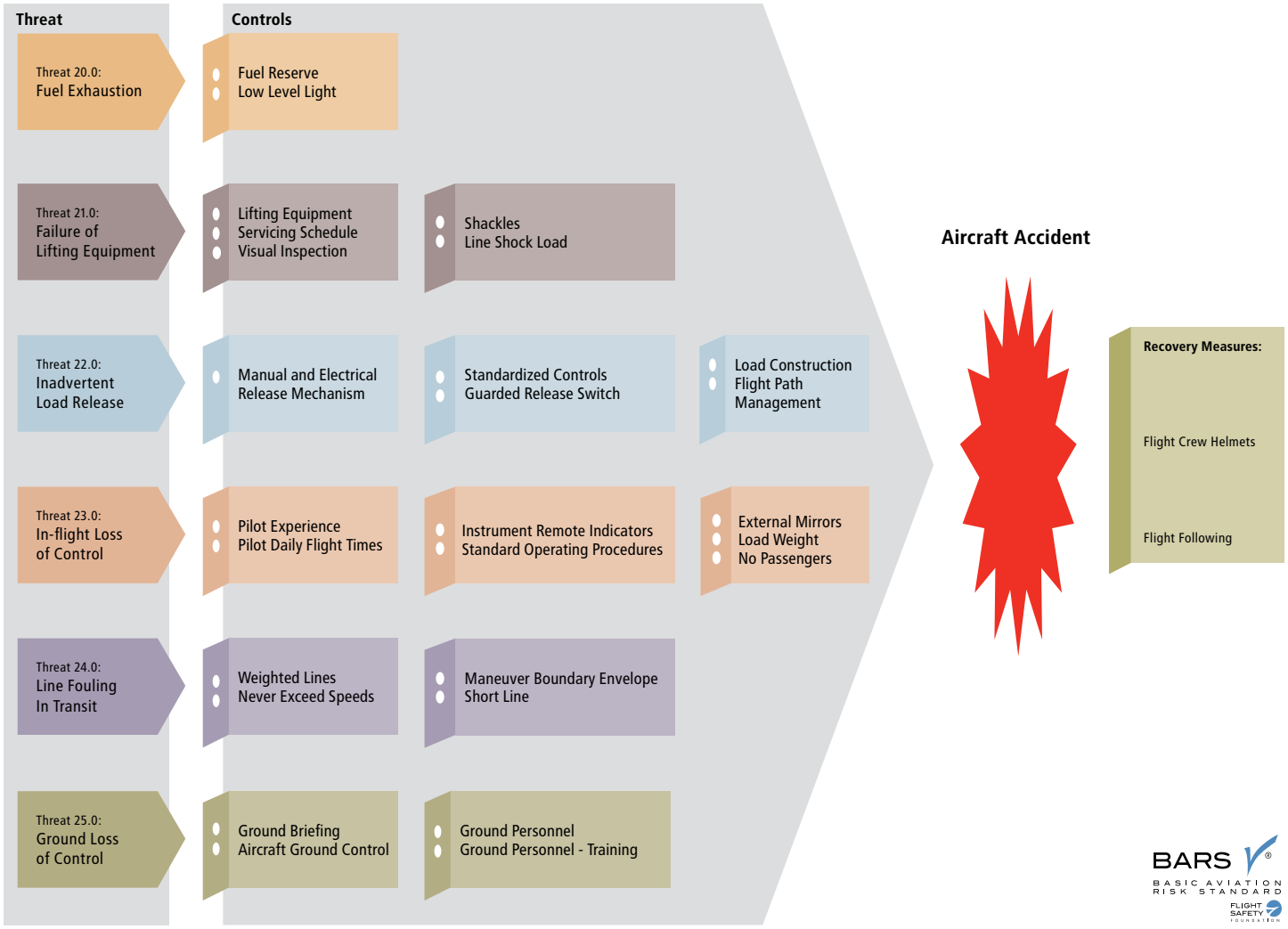
Appendix 3:

Abbreviations

ACAS	Airborne Collision Avoidance System
ADF	Automatic Direction Finder
ADM	Aeronautical Decision Making
ADS	Air Drop System
ADS-B	Automatic Dependent Surveillance - Broadcast
AELTS	Aviation English Language Test Services
AFCS	Automatic Flight Control System
AGL	Above Ground Level
ALAR	Approach and Landing Accident Reduction
AMSL	Above Mean Sea Level
AOC	Air Operator's Certificate
AP	Autopilot
APU	Auxiliary Power Unit
ASI	Air Speed Indicator
ATC	Air Traffic Control
ATPL	Air Transport Pilot Licence
AWOS	Automated Weather Observation System
BARS	Basic Aviation Risk Standard
BIG	BARS Implementation Guidelines
CAA	Civil Aviation Authority
CBT	Competency Based Training
C of G	(Aircraft) Center of Gravity
CFIT/W	Controlled Flight into Terrain/Water
CMT	Critical Maintenance Task
CPL	Commercial Pilot's Licence
CRM	Crew Resource Management
CVR	Cockpit Voice Recorder
DG	Dangerous Goods
DME	Distance Measuring Equipment
DZC	Drop Zone Coordinator
DZ	Drop Zone
EFB	Electronic Flight Bags (EFB)
ELT	Emergency Locator Transmitter
EPIRB	Emergency Position Indicating Radio Beacon
ERP	Emergency Response Plan
FAA	Federal Aviation Authority (USA)
FDM	Flight Data Monitoring
FDR	Flight Data Recorder
GA	General Aviation
GPS	Global Positioning System
HF	High Frequency
HUET	Helicopter Underwater Escape Training
HUMS	Health and Usage Monitoring System
IAGSA	International Airborne Geophysics Safety Association
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
LSALT	Lowest Safe Altitude
MAP	Missed Approach Point
MEL	Minimum Equipment List
NDB	Non-Directional Beacon
NVIS	Night Vision Imaging System
NVFR	Night Visual Flight Rules
OEI	One Engine Inoperative
OEM	Original Equipment Manufacturer
ORA	Operational Risk Assessment
PCN	Pavement Classification Number
PCO	Passenger Control Officer
PIC	Pilot-in-Command
PLB	Personal Locator Beacon
PPE	Personal Protective Equipment
RPAS	Remote Piloted Aircraft System
SAR	Search and Rescue
SMS	Safety Management System
SOP	Standard Operating Procedure
STC	Supplementary Type Certificate
SVFR	Special Visual Flight Rules
TAWS	Terrain Awareness Warning System
TCAS	Traffic Collision Avoidance System
TEM	Threat and Error Management
TSO	Technical Standards Order
UMS	Unit Monitoring System
VFR	Visual Flight Rules
VHF	Very High Frequency
VMC	Visual Meteorological Conditions
VMS	Vibration Monitoring System
VOR	VHF Omni Directional Range navigation system
VSI	Vertical Speed Indicator
V_Y	Best Rate of Climb Speed
V_1	Decision Speed on Takeoff
WSPS	Wire Strike Protection System

External Load Operations

Figure 3: BARS Bow Tie Risk Model – Schematic of Aviation Risk Management Controls and Recovery Measures for External Load Operations.



BARS BASIC AVIATION RISK STANDARD FLIGHT SAFETY foundation

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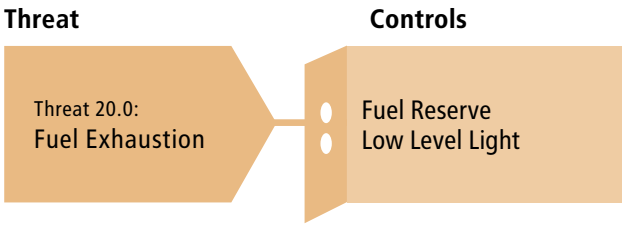
Threat 20.0: Fuel Exhaustion

The helicopter operates on minimum fuel load to maximize lifting capability, runs out of fuel and suffers an engine flame-out resulting in an accident



Control 20.1: Fuel Reserve

Ensuring sufficient fuel is carried, including required reserves.

Maintain a minimum fuel reserve of 20 minutes at all times.

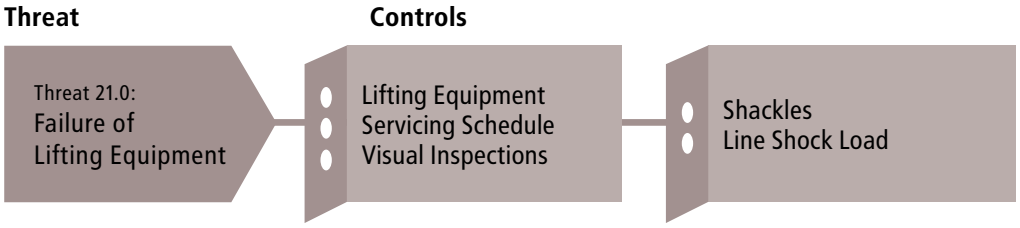
Control 20.2: Low Level Light

Ensuring flight crew situational awareness with regard to available fuel reserves.

When available for the aircraft type, a fuel low level warning light must be fitted.

Threat 21.0: Failure of Lifting Equipment

The lifting equipment fails and drops the load resulting in an accident on the ground



Control 21.1: Lifting Equipment

Ensuring certification of lifting equipment and compliance with the equipment manufacturer's servicing requirements.

The aircraft operator must ensure the serviceability and certified safe working load of lifting equipment is adequate for the task and appropriate to the material used for the line.

Control 21.2: Servicing Schedule

Ensuring early detection of impending failure of load lifting equipment.

Lifting equipment must conform to a servicing schedule that provides all necessary documentation associated with inspections, certification and serviceability. Copies of this servicing schedule must be made available to the aircraft operator's representatives in the field.

Control 21.3: Visual Inspections

Ensuring servicing routines are supplemented with visual inspections prior to each use.

All lifting equipment (cables, lines, straps, baskets, swivels, clevises, etc.) must be inspected by qualified personnel daily prior to the flight. Any signs of wear, fraying, corrosion, kinks or deterioration must result in the equipment being discontinued from use.

Control 21.4: Shackles

Ensuring that shackles are compliant and compatible with other load lifting equipment.

The shackles used to connect the cable to the aircraft must conform to specific Flight Manual supplements regarding the diameter of the shackle rings and their use with respective hook types on the aircraft.

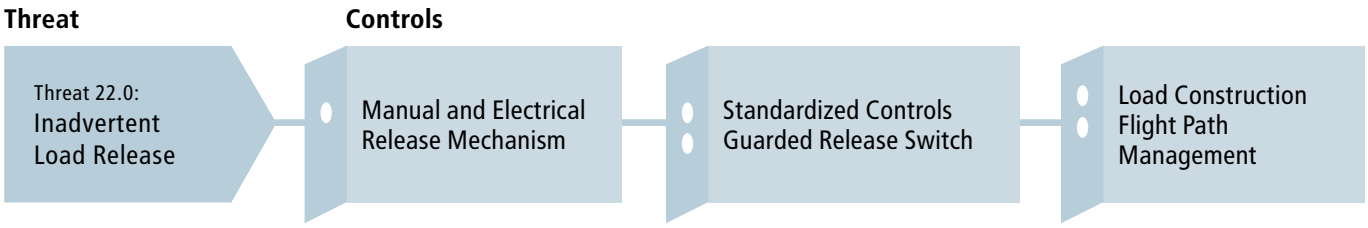
Control 21.5: Line Shock Load

Ensuring all lines are checked for serviceability following a shock load event.

The aircraft operator must ensure that pilots are familiar with shock load, conditions that can lead to it and have a process in place for detailed line inspection following an actual or suspected shock load event. Where available, tell-tale links that provide visual confirmation a line has not been subjected to deformation resulting from shock load should be used.

Threat 22.0: Inadvertent Load Release

The load is inadvertently released in-flight, falls to the ground and causes an accident



Control 22.1: Manual and Electrical Release Mechanism

Ensuring that aircraft have appropriate mechanisms for release of loads in normal and emergency situations.

The aircraft must have a serviceable cockpit manual and electric release mechanism and an external manual release at the hook.

Control 22.2: Standardized Controls

Removing the potential of inadvertent load release.

When practical for aircraft of the same or similar type, the aircraft operator must standardize electrical load release switches, particularly when located on the cyclic and collective controls.

Control 22.3: Guarded Release Switch

Removing the potential of inadvertent load release.

When available for the aircraft type, all electrical release switches must be guarded or collared to prevent inadvertent activation.

Control 22.4: Load Construction

Ensuring that all loads are rigged by appropriately trained and qualified personnel, and all external lifts are flown to the agreed load plan agreed to by the pilot.

The aircraft operator must ensure that all loads are approrpiately rigged by qualified personnel. The load plan for all external lifts must be documented and reviewed with pilot during the start-up operational risk assessment. Any deviation from the plan must first be agreed to by the pilot.

Control 22.5: Flight Path Management

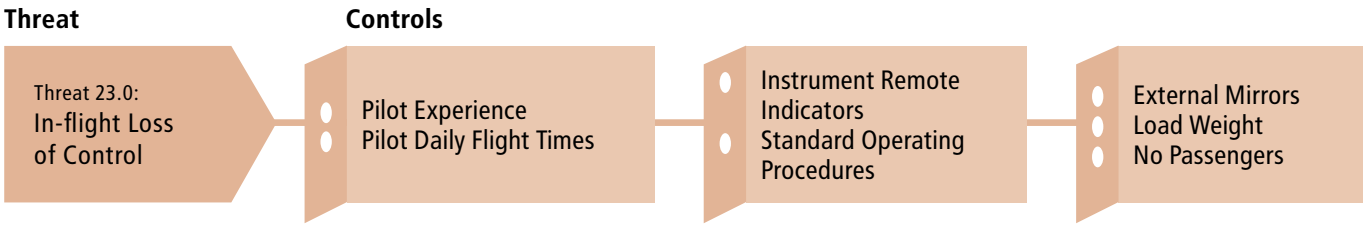
Ensuring personnel below the aircraft are not impacted by release of the load.

The aircraft operator must have procedures that minimizes external load flights over populous areas, dwellings and personnel. Furthermore, ground crew working with external loads must be briefed not to enter the load footprint at any stage during approach or departure of the aircraft.

Courtesy: Skyhorse Aviation

Threat 23.0: In-flight Loss of Control

Poor manipulative control in-flight results in a loss of control and an aircraft accident



Control 23.1: Pilot Experience

Ensuring flight crew are adequately trained and have sufficient experience to conduct helicopter external load operations.

Pilots engaged in external load activities must comply with the following requirements:

- Successful completion of operator's external load training program tailored to the vertical reference and the long-line (>50 feet), or the short-line (<50 feet), whichever is applicable;
- At least 200 hours external load operations, 100 of which must be vertical referencing (if used in that role); and
- An annual long-line and/or external load base check with designated check and training personnel.

Control 23.2: Pilot Daily Flight Times

Ensuring that the flight crew is not impacted by fatigue.

Where the external load moves are more than three per hour, comply with the following flight times:

Single-pilot operation	Two-pilot operation
3 hour maximum flight time per flying period, followed by a 30 minute rest-break. Hot refueling does not constitute a rest-break.	5 hour maximum flight time per flying period, followed by a 60 minute rest-break.
6 hour maximum flight time per calendar day.	8 hour maximum flight time per calendar day.

Control 23.3: Instrument Remote Indicators

Ensuring that flight crew can adequately monitor critical aircraft operational limits at all times.

For single-pilot operations using vertical referencing techniques and where the aircraft instruments are not in the pilot's scan, remote indication of fire warning light and torque gauge shall be fitted where possible for the aircraft type.

Control 23.4: Standard Operating Procedures

Ensuring safe, efficient and standardized external load lifting operations.

The helicopter operator must have Standard Operating Procedures outlining requirements of personnel engaged in the external load activity. The procedures must be relevant to the local environment and terrain being operated in. All pilots engaged in external load operations must participate in a pre-start operational risk assessment with all ground crew to ensure the SOPs are agreed and understood.

Control 23.5: External Mirrors

Ensuring enhanced situational awareness of the external load at all times.

Where available for the helicopter type, external mirrors showing the hook area must be fitted to the aircraft. Where fitted, the mirror must not interfere with the design and operation of the Wire Strike Protection System (WSPS).

Control 23.6: Load Weight

Ensuring accurate load weights are known and within aircraft limits.

All loads must have accurate weights provided to the pilot before each lift. Standard load plans can be used as long as the weights are accurately known (compressors, rig break-down, sample bags, etc). A load meter must be fitted to the aircraft if considered necessary during the pre-start risk assessment.

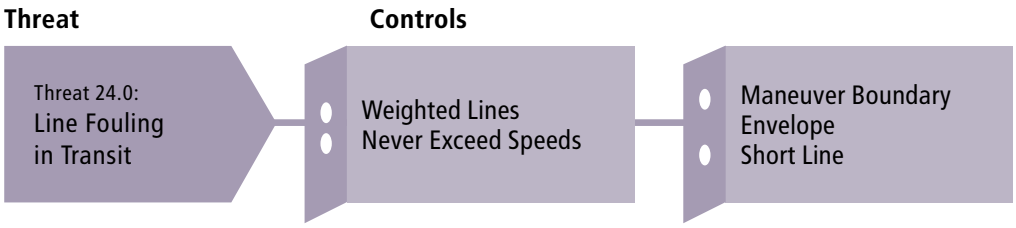
Control 23.7: No Carriage of Passengers

Removing unnecessary exposure to risk for passengers.

Only personnel who are employed or contracted by the aircraft operator to accomplish the work activity directly associated with that operation may be carried on helicopters during external load operations. This includes transit with an empty line attached.

Threat 24.0: Line Fouling In Transit

The load becomes detached from the line or the line is flown empty which, when above a certain speed, causes it to stream up and rearwards into the tail rotor resulting in an accident



Control 24.1: Weighted Lines

Ensuring helicopter systems cannot be fouled by unweighted lines.

The long-line must be weighted to prevent potential fouling with the tail rotor if the long-line is to be flown without a load attached. Implement pre-takeoff checks which are designed to ensure flight crew involved in repetitive load operations are aware of when the line is attached.

Control 24.2: Never Exceed Speeds

Ensuring that the external load remains stable and controllable at all times.

All applicable speed limitations must be briefed and understood by all flight crew prior to the commencement of operations. If the aircraft Air Speed Indicator (ASI) is calibrated in different units of measurement than the documented speed limitations, a separate risk assessment must be conducted and reviewed with a Competent Aviation Specialist prior to start.

Control 24.3: Maneuver Boundary Envelope

Ensuring that the external load remains stable and controllable at all times.

All safe transit speeds, the maximum angle of bank, the maximum allowable rate of descent and general handling associated with stable load operations must be briefed and understood by all flight crew prior to the commencement of operations. Localized conditions, such as the effects of turbulence and wind, must be talken into consideration with the load design to ensure any aerodynamic potential of the load is minimised. Where necessary, apply lift-spoiling drag devices to the load to prevent dynamic instability.

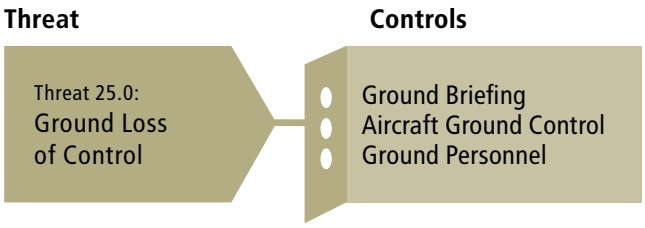
Control 24.4: Short-Line (<50 feet)

Ensuring that the helicopter systems cannot be fouled by unweighted lines.

Transit with a short-line and no load attached is not permitted.

Threat 25.0: Ground Loss of Control

A departure from normal operations on the ground results in loss of control of the load and aircraft resulting in an aircraft accident



Control 25.1: Ground Briefing

Ensuring all personnel involved in the external load lifting operations are comprehensively briefed.

The pilot must ensure all personnel involved in the external load activity are briefed prior to the commencement of operations. This brief must include all emergency scenarios that could involve the ground crew.

Control 25.2: Aircraft Ground Control

Ensuring safety of all personnel in the vicinity of helicopters conducting external load lifting operations.

A pilot must remain at the controls of an operating helicopter under power and whilst on the ground at all times.
The controls must not be left unattended with the aircraft under power in any circumstances, even to assist in activities such as hot refueling or load attachment.

Control 25.3: Ground Personnel

Ensuring ground personnel have appropriate personal protection.

Ground personnel must wear appropriate Personal Protective Equipment (PPE) including hard hats with chin straps, impact resistant goggles, gloves, safety shoes, high visibility vests and a means of ground-to-air communications with the flight crew.

Control 25.4: Ground Personnel - Training

Ensuring ground personnel associated with external load activities have the required training.

All personnel associated with external load ground operations including load preparation and handling suspended loads must have received training relevant to the activity, such as the Flight Safety Foundation's Helicopter External Load Operations (HELO) course.

Defences 29.0: Aircraft Accident

Mitigating defences in the event of an aircraft accident

Defence 29.1: Flight Crew Helmets

Ensuring flight crew conducting external load operations have appropriate head protection.

Flight crew involved in external load activities must wear serviceable flying helmets that comply with industry standards.

Defence 29.2: Flight Following

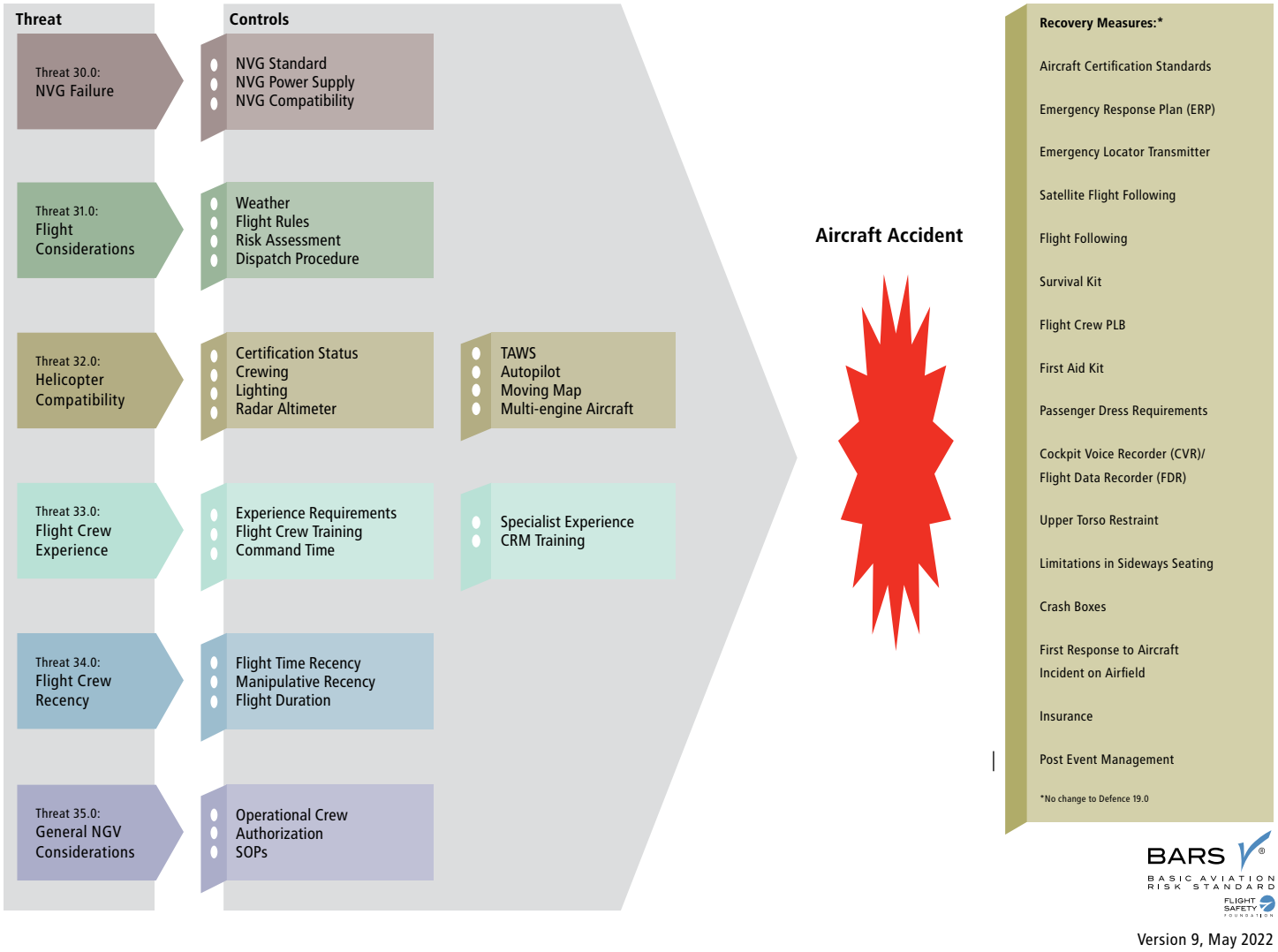
Ensuring that the position of helicopters conducting external load operations is known at all times.

Positive continuous communication and flight following must be maintained with the aircraft either by ground support crew or designated flight following personnel. Operation normal calls must be scheduled at least every 30 minutes unless the risk assessment requires a greater frequency.

Appendix 5:

Night Vision Goggles (NVG) Operations

Figure 4: BARS Bow Tie Risk Model – Schematic of Aviation Risk Management Controls and Recovery Measures for Night Vision Goggles (NVG) Operations.



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Definitions

Night Vision Goggles (NVGs). A binocular appliance that amplifies ambient light and is worn by a pilot. The NVGs enhance the pilots' ability to maintain visual reference to the surface at night.

Night Vision Imaging System (NVIS). A system that integrates all elements necessary to successfully and safely operate a helicopter with NVGs. The system includes NVGs, NVIS compatible lighting and other helicopter components.

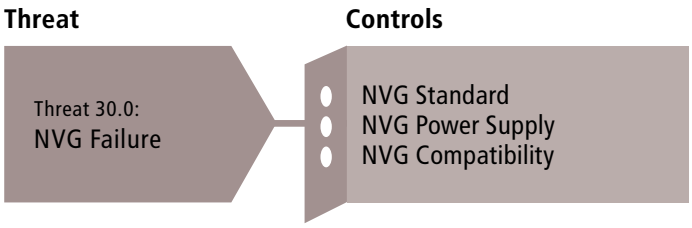
Medevac. Medical Evacuation (Medevac) is a specific flight with the purpose of retrieving a patient in medical distress from injury or illness.

Applications

Role specific applications including, not limited to: Medevac, marine pilot transfer and cold environment pipeline patrol.

Threat 30.0: NVG Failure

NVG equipment failure leads to one or more of the crew losing night vision capability and disorientation



Control 30.1: NVG Standard

Ensuring NVGs are certified to the correct standard.

NVGs must be certified to a minimum standard of TSO-C164 (equivalent of ANVIS 9 with Omnibus 4 Image Intensifier Tubes). Goggles introduced post release of TSO-C164 must meet the performance requirements of RTCA/DO-275.

Control 30.2: NVG Power Supply

Ensuring NVGs have a power supply with back-up facility that is independent of aircraft electrical systems.

NVGs must be battery powered (not supplied by aircraft electrical power) and equipped with an automatic power supply change over, or a minimum 30 minute battery warning to the user.

Control 30.3: NVG Compatibility

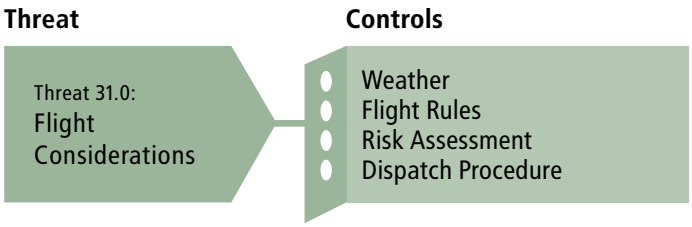
Ensuring all NVGs used by flight crew are compatible with spares available.

Each crew member must use the same model of NVG. Carry on-board a spare set of NVGs of the same model and make them readily accessible by the crew.

Courtesy: HeliWest

Threat 31.0: Flight Considerations

Preflight preparation must take into account the anticipated weather and visibility to support safe NVG operations



Control 31.1: Weather

Ensuring weather conditions are suitable for NVG operations by meeting Visual Meteorological Conditions.

Forecasted weather conditions along the planned route must meet Visual Meteorological Conditions (VMC) or better. The weather forecast must provide:

- Illumination prediction (moon, starlight); and
- Risk of reduced visibility in blowing snow, dust, haze.

Control 31.2: Flight Rules

Ensuring helicopters are dual pilot capable and certified for Instrument Flight Rules flight as a safety redundancy measure.

Helicopters must be fully Instrument Flight Rules (IFR) compatible (refer to Controls 5.1 to 5.10 and Appendix 2) and certified for dual IFR operations in accordance with local regulatory requirements.

Control 31.3: Risk Assessment

Ensuring all risks associated with NVG operations are analyzed, minimized and accepted.

Perform and document a risk assessment and brief the crew on it prior to each NVG activity.

Control 31.4: Dispatch Procedure

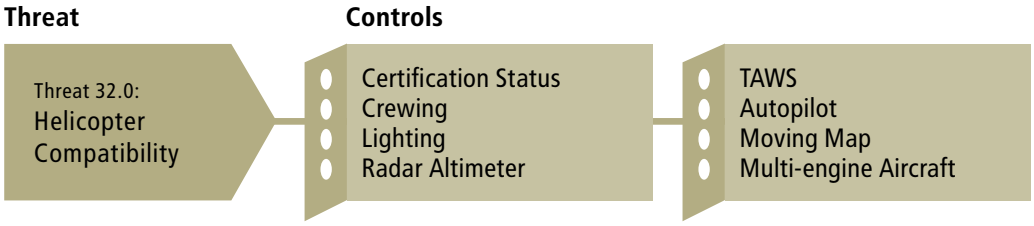
Ensuring NVG operations are appropriately planned, risk assessed and authorized.

Develop and implement a flight dispatch procedure that covers mission development, flight planning, risk assessment, mitigation and authorization processes.

Courtesy: Skyhorse Aviation

Threat 32.0: Helicopter Compatibility

Insufficient or incompatible equipment or aircraft features lead to a misinformation or misjudgment by the crew



Control 32.1: Helicopter Certification Status

Ensuring helicopters that conduct NVG operations are appropriately certified for NVIS.

Helicopters must be produced or modified with an NVIS certification under an approved Supplementary Type Certificate (STC) or Federal Aviation Administration (FAA) AC 27-1B MG 16 (or equivalent) and/or FAA AC 29.2C MG 16 (or equivalent).

Control 32.2: Helicopter Crewing

Ensuring helicopters that conduct NVG operations are appropriately crewed.

Helicopters must be crewed by two-pilots with dual controls and instruments for full IFR operations.

Control 32.3: Helicopter Lighting

Ensuring helicopters that conduct NVG operations are equipped with external lighting to permit safe operations.

Helicopters must be equipped with a fully steerable searchlight (preferably infrared) capable of being operated from either pilot station.

Control 32.4: Radar Altimeter

Ensuring the provision of reliable RADALT data and warning to provide clear and reliable awareness of height above terrain/water.

Helicopters must be equipped with either a dual output radar altimeter, or two independent radar altimeters equipped with visual and aural height warnings with variable height alert that can be set by the flight crew.

Control 32.5: Terrain Awareness Warning System (TAWS)

Ensuring the accurate detection of terrain and adjacent obstacles so as to allow timely corrective action if necessary.

Helicopters must be equipped with a Terrain Awareness Warning System (TAWS) that meets the requirements of TSO-C194.

Control 32.6: Autopilot

Ensuring pilot workload is minimized.

Helicopters must be equipped with a three-axis autopilot to relieve crew workload.

Control 32.7: Moving Map

Provision of enhanced situational information to the flight crew.

For long-term contracts exceeding three years, and where practicable for the aircraft type, a moving map capability must be fitted to enhance crew situational awareness.

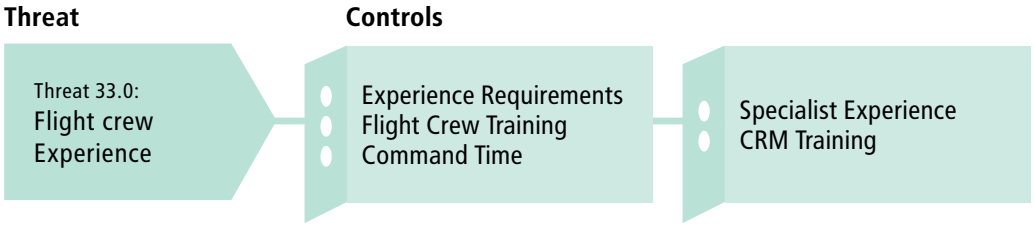
Control 32.8: Multi-engine Aircraft

Ensuring the safety of occupants in the event of engine failure.

Use a multi-engine aircraft when conducting flights on NVGs.

Threat 33.0: Flight Crew Experience

A lack of training or experience leads to loss of control and accident



Control 33.1: Flight Crew Experience Requirements

Ensuring flight crew are competent to conduct NVG operations by having appropriate experience.

In addition to Appendix 1 requirements, all flight crew must have a minimum of 50 hours of night (VFR or IFR), unaided flight time.

Control 33.2: Flight Crew Training

Ensuring flight crew are competent to conduct NVG operations by through appropriate training.

Flight crew must have successfully completed an approved NVG course that includes a minimum of five training sorties of at least one hour flight time duration each.

Control 33.3: Pilot Command Time

Ensuring the Pilot-in-Command is competent to command NVG operations through appropriate experience.

The aircraft captain must have ten hours Pilot-in-Command NVG flight time logged.

Control 33.4: Specialist Experience

Ensuring flight crew conducting specialist NVG operations have appropriate training to allow safe operations.

Where specialist NVG operations are considered (for example, confined area, hook, hoist, Marine Pilot Transfer), qualifications as required by each role must be certified by the NVG training provider.

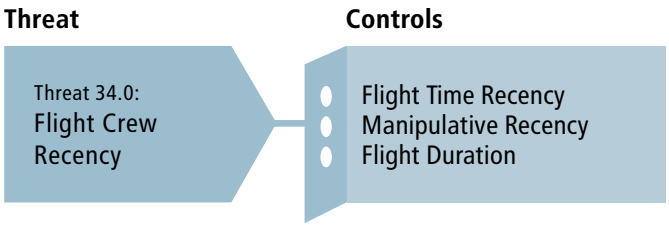
Control 33.5: Crew Resource Management (CRM) Training

Ensuring the CRM training for flight crew involved in NVG operations includes NVG specific scenarios.

In addition to the CRM training requirements contained in Appendix 1, the aircraft operator must provide role-based scenarios for NVG crew in a CRM recency context.

Threat 34.0: Flight Crew Recency

A lack of recent NVG experience leads to a manipulative error and accident



Control 34.1: Flight Time Recency

Ensuring minimum flight crew recency to enable safe NVG operations.

In addition to Appendix 1 requirements, flight crew must complete a minimum of 50 hours flight time in the preceding 90 days; 10 hours of which must be on the aircraft type.

Control 34.2: Manipulative Recency

Ensuring minimum 'hands on' time for flight crew to enable safe NVG operations.

Each pilot must complete the following in the preceding 90 days using NVGs:

- Three night takeoffs;*
- Three night landings;*
- Three specialist hovering tasks; and
- Three transition tasks (NVG to non-NVG back to NVG operations).

*Must include a climb, level flight segment and descent of at least the equivalent of one circuit for each rotation.

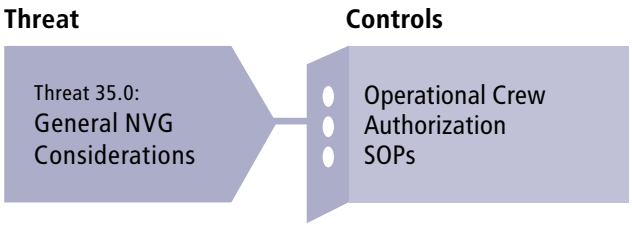
Control 34.3: Flight Duration

Ensuring flight crew fatigue is appropriately managed due to the higher workload of NVG operations.

Each pilot must not be scheduled to fly more than five hours on NVGs during any single flight duty period.

Courtesy: Nautilus Aviation

Threat 35.0: General NVG Considerations



Control 35.1: Operational Crew

Removing unnecessary exposure to risk for passengers.

Do not carry passengers on training or operational flights, other than those specifically authorized for the task by both the company and aircraft operator.

Control 35.2: Authorization

Ensuring NVG operations have local regulatory authority approval.

Aircraft operators must be approved by the local regulatory authority for the conduct of NVG operations. All local regulatory requirements must be met, and will take precedence to any requirement contained in this Standard.

Control 35.3: Standard Operating Procedures

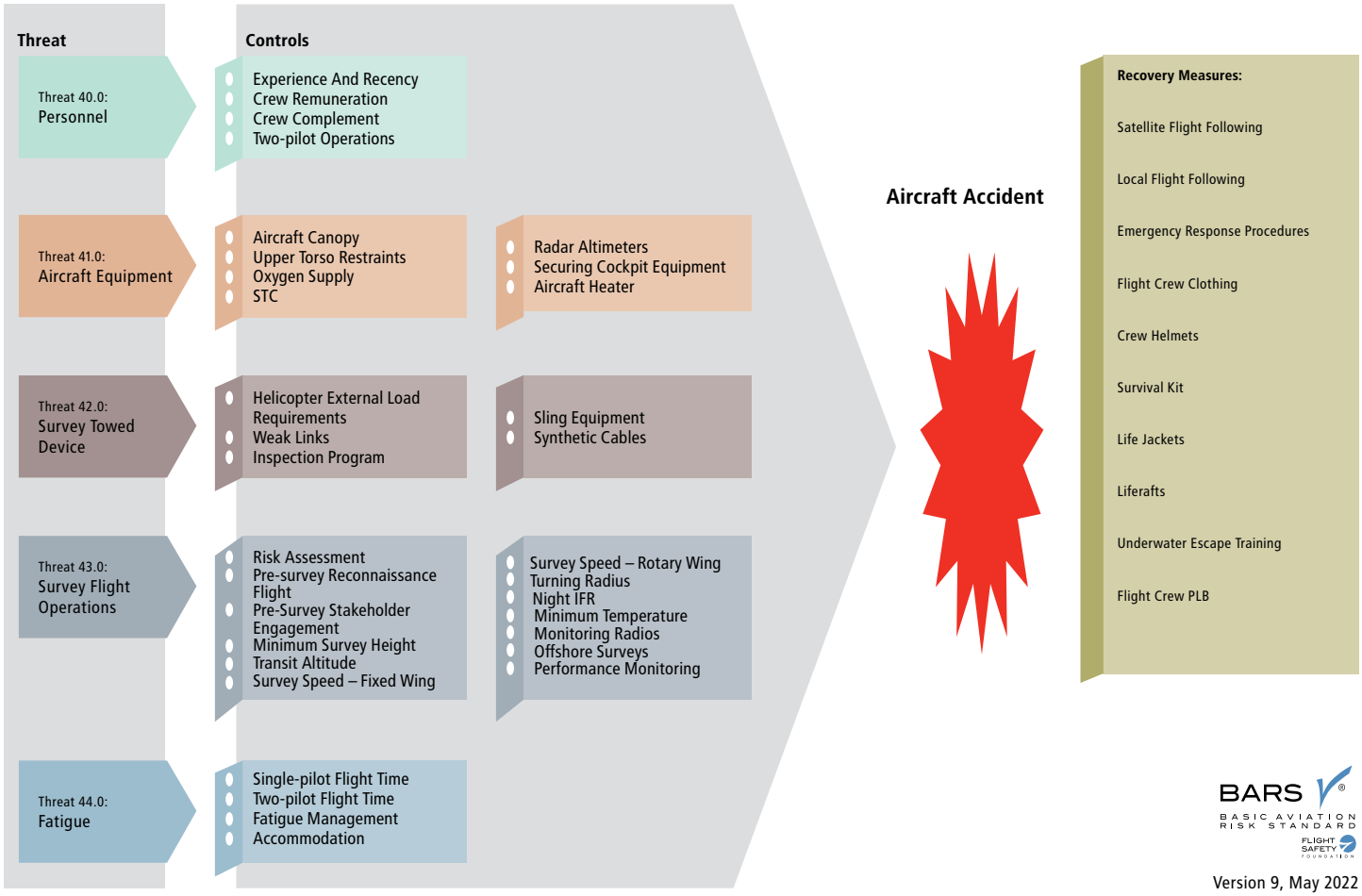
Ensuring safe, efficient and standardized NVG operations.

Aircraft operators must have SOPs that define:

- NVG crew roles and responsibilities;
- Goggle/de-goggle procedures and limitations; and
- Emergency de-goggle procedures.

Airborne Geophysical Survey Operations

Figure 5: BARS Bow Tie Risk Model – Airborne geophysical survey operations are higher risk than other aviation activities in the resource sector. All proposed activities are subject to a detailed risk analysis that meets the standards of the company, aircraft operator and the IAGSA.



BARS BASIC AVIATION RISK STANDARD FLIGHT SAFETY FOUNDATION

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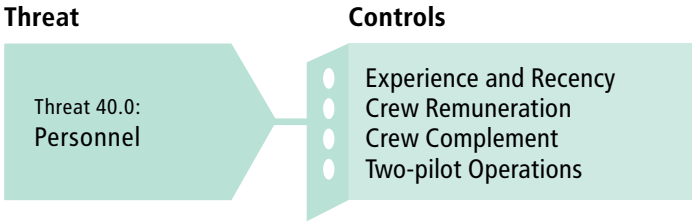
Threat 40.0: Personnel

Inadequate experience or high workload causes poor decision making and results in an accident



Control 40.1: Aircrew Experience and Recency

Ensuring flight crew are competent to conduct survey operations duties by having appropriate training, qualifications and recent experience.

The following requirements are in addition to those listed in Appendix 1.

Experience and Recency Requirement	Captain	Co-pilot	Other crew	Footnote
All BARS Appendix 1 requirements	Yes	Yes		
Total time – geophysical	300 hours	10 hours		6
Command/ICUS time – geophysical	300 hours	0 hours		1
Command/ICUS on contract aircraft type	100 hours	0 hours		2
Command/ICUS preceding 90 days	50 hours, ten on contract aircraft type	0 hours		2
Geophysical training program	Yes	Yes	Yes	3
Simulator training	Yes	Yes		4
Helicopter Underwater Escape Training	Yes	Yes	Yes	5
Survey Crew Resource Management	Yes	Yes	Yes	

1. Agricultural pilots with formal ratings provided by a regulatory authority, who have at least 500 hours of low level agricultural flying incorporating GPS line flying, may apply a 250 hour credit towards total Command time.
2. Successful completion of a geophysical line check by a qualified company check pilot of at least two hours on the contract aircraft type being used for survey (excluding use of ferry time) may be used for the preceding 90 day recency requirements. Furthermore, the type-specific line check may be used in lieu of 50% of the 100 hours Command/ICUS time on aircraft type required. Document flight crew competencies against established criteria.
3. Successful completion of a geophysical training program and where applicable a mountain flying course. Document flight crew competencies against established criteria. Where the aircraft is operating with a fuel system that has been modified from the original certification criteria, include a specific training module on fuel system management.
4. In addition to training on the actual aircraft, when reasonably available and supported by the client, flight crew must undergo periodic simulator training that includes low-level emergencies and marginal performance situations (including V_{MCA}).
5. HUET training must be conducted for all crew involved in over-water ferry flights and offshore geophysical operations.
6. A geophysical orientated Competency-Based-Training (CBT) reviewed and endorsed by a Competent Aviation Specialist may be used.

Threat 40.0 (cont.)

Control 40.2: Flight Crew Remuneration

Ensuring that the safety of survey operations is not compromised by unnecessary pressure on flight crew.

To remove unnecessary pressure to fly and potentially compromise minimum standards, flight crews must not be paid on the basis of hours or distance flown.

Control 40.3: Crew Complement

Ensuring crew composition planning is cognizant of the high workload of survey flying and is appropriately managed.

The minimum crew complement must be a pilot and operator. Single-pilot only operations must only be accepted after conducting a risk assessment which delivers mitigation measures acceptable to all. Where an observer is carried due to operating country requirements, the observer is to be considered part of the crew.

Control 40.4: Two-pilot Operations

Ensuring night surveys and high workload survey operations are conducted as two-pilot operations.

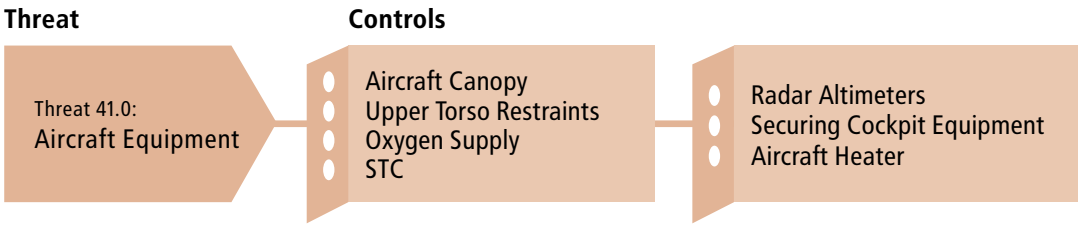
Night surveys must be operated with a two-pilot crew. Conduct a pre-start risk assessment on two-pilot operations when:

- Performing low-level offshore surveys; and/or
- Areas where a high workload is anticipated with managing traffic and/or airspace.

Courtesy: Skyhorse Aviation

Threat 41.0: Aircraft Equipment

Certified and appropriate equipment must be fitted and serviceable prior to departure on a survey flight



Control 41.1: Aircraft Canopy

Ensuring aircraft canopies allow safe operations and reduced flight crew workload.

To facilitate good lookout and field-of-view, the aircraft canopy and all transparencies must be clear, unscratched and serviceable throughout the activity.

Control 41.2: Upper Torso Restraints

Ensuring aircraft occupants survive a crash impact.

Four-point upper torso restraints with lockable inertia reels must be provided to all aircraft occupants.

Control 41.3: Oxygen Supply

Ensuring aircraft oxygen systems are properly maintained and available to flight crew when required for safe operations.

The aircraft must have continuous oxygen capability if unpressurized and operating above 10,000 feet AMSL.

Control 41.4: Supplemental Type Certificate (STC)

Ensuring all modifications to survey aircraft are in accordance with approved engineering data.

All role-specific equipment must be installed under an STC or Engineering Order.

Control 41.5: Radar Altimeter

Ensuring the provision of reliable RADALT data and warnings to provide clear and reliable awareness of height above terrain/water.

Equip the aircraft with either a dual output radar altimeter or two independent radar altimeters when flown with two pilots, or a single radar altimeter when flown single pilot. The radar altimeter/s are to be fitted with visual and aural height warnings, and a variable height alert that can be set by the crew.

Control 41.6: Securing Cockpit Equipment

Ensuring additional survey equipment is properly fitted and secured and does not impede safe operations.

Any additional cockpit instrumentation (such as course deviation indication and/or heads-up instrumentation) must be properly secured and not obstruct the crew field-of-view. Instrumentation that requires input from a crew member must be within easy reach and within the normal operating field of vision.

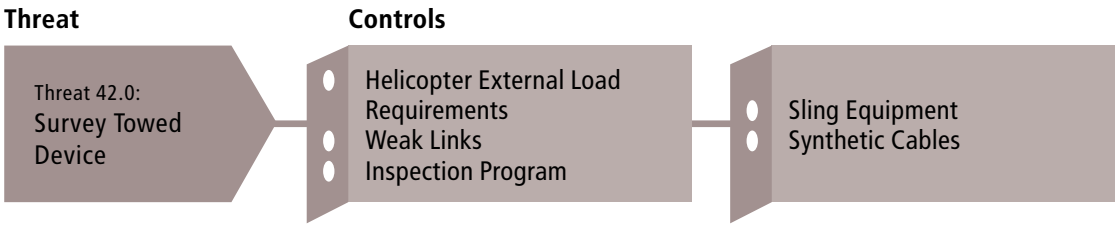
Control 41.7: Aircraft Heater

Ensuring that use of the aircraft heater is unrestricted.

The use of an aircraft heater must not be restricted for crew use in the interest of 'clean' data.

Threat 42.0: Survey Towed Device

Lifting equipment fails and the survey load drops to the ground causing an accident



Control 42.1: Helicopter External Load Requirements

Ensuring compliance with the safety requirements of external load operations.

Helicopter external load equipment such as towed arrays must follow all requirements contained within Appendix 4.

Control 42.2: Weak Links

Ensuring safe flight can be maintained in the event of towed arrays being snagged.

Where a survey device is towed, install an approved weak link in the line that is certified for the purpose by the responsible regulatory authority and/or approved design/ manufacturer facility.

For helicopters the weak link must be positioned at the hook end of the cable near the helicopter. For fixed wing aircraft it must be located near the device since it is winched in and out of the aircraft.

The device's data cable must be fitted in a similar manner with a suitably frangible link that releases from the aircraft when subjected to half the total mass of the towed device.

Control 42.3: Inspection Program

Ensuring early detection of impending failure of survey equipment.

A documented inspection program approved by the Original Equipment Manufacturer (OEM) and/or design authorities must incorporate the following requirements:

- All certification and design approval authorities (basis for design) of the equipment and devices;
- Pre and post flight inspections documenting serviceability of all cables, shackles, survey devices, attachment points and associated hardware;
- Maintenance procedures for part damage and/or wear including all relevant part numbers and critical design specifications of the device;
- Emergency actions in the event of device load-bearing failure or ground vegetation contact; and
- Failure modes of the load-bearing device and any associated aerodynamic effects.

Control 42.4: Sling Equipment

Ensuring early detection of impending failure of sling cable assemblies.

All slings must be made up of serviceable cables that are inspected in accordance with a servicing schedule. Current and traceable load test certifications for each cable must be documented. Each cable or cable assembly must have a swaging collar or other appropriate permanent marking to indicate length, diameter and rated strength of the item.

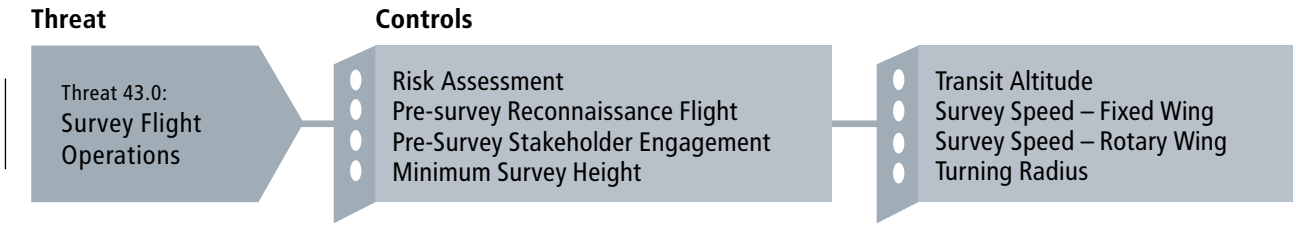
Control 42.5: Synthetic Cables

Ensuring safe of operation of synthetic sling cables if utilized.

Synthetic cables may be used if the operator can demonstrate that the cables do not exhibit excessive stretch when under load and are sufficiently weighted to ensure they do not interfere with the aircraft control surfaces or main/tail rotor at any time.

Threat 43.0: Survey Flight Operations

Flight operations outside a safe envelope places the operation at increased risk of Loss of Control In-flight (LOC-I) or Controlled Flight into Terrain (CFIT)



Control 43.1: Risk Assessment

Ensuring all risks associated with geophysical operations are analyzed, minimized and accepted.

Aircraft operator performs and documents a risk assessment that has been reviewed by a competent aviation specialist and has involved all relevant stakeholders including flight crew.

Control 43.2: Pre-survey Reconnaissance Flight

Ensuring low level survey flight is conducted with an awareness of all obstacles that pose a threat.

Prior to commencing any new project a pre-survey reconnaissance flight (or flights) will be conducted at a safe altitude with the aim of identifying legal and illegal wire constructions, towers, structures and any object that could be considered a hazard to aircraft operating in the low-level flight regime.

Control 43.3: Pre-Survey Stakeholder Engagement

Ensure all known Remotely Piloted Aircraft Systems (RPAS) operations conducted in the area of operations are made aware of the impending low-level geophysical activity.

Where RPAS activities can be anticipated, such as in the vicinity of production mine sites, port areas or along pipeline/powerline routes, the aircraft operator is to advise all known RPAS users of their operations and reference FSF RPAS Simultaneous Operations (Simops) protocol articulated in RPAS Standard Annex A Model of Separation Standards.

Control 43.4: Minimum Survey Heights

Ensuring surveys are conducted at a safe height after consideration of all factors including terrain and aircraft type.

The survey height is defined as the height above obstacle level, such as the top of a jungle canopy in a tropical environment or ground level in desert conditions. Where the survey height is nominated below 100 meters for fixed wing, 60 meters for helicopters or 50 meters for a towed object, approval must be based on a risk assessment and agreed by all parties.

Control 43.5: Transit Altitude

Eliminating the risks associated with low level operations when low level operations are not necessary.

Transit altitude must be above 500 feet above ground level.

Control 43.6: Survey Speed – Fixed Wing

Ensuring appropriate survey speeds are calculated for fixed wing aircraft to allow safe control margins.

For all fixed wing aircraft the minimum safe survey speed must be calculated using the greater of:

- 130% of clean stall speed (V_S);
- 110% of best single-engine rate of climb speed (V_{YSE}) if applicable; or
- Minimum safe single-engine speed (V_{SSE}) if published.

Minimum speeds must be adhered to regardless of turbulence, gusts or when trading speed for altitude.

Control 43.7: Survey Speed – Rotary Wing

Ensuring appropriate survey speeds are calculated for rotary wing aircraft to allow safe control margins.

With the exception of takeoff and landings, helicopters must minimize flight inside the avoid curve of the published height velocity diagram or below single-engine fly-away speed for multi-engine helicopters. Where operations in this flight regime are unavoidable due to the type of survey and equipment, conduct a risk assessment including an assessment of the terrain.

Control 43.8: Turning Radius

Ensuring appropriate limitations on aircraft turns during surveys.

Limit turns at low-level to a maximum angle of bank of 30 degrees and conduct them at a constant altitude. If the aircraft must climb due to the surrounding terrain, it should climb to the required height prior to commencing the turn. Descent back to survey height must only occur after wings level attitude is established.

Threat 43.0 (cont.)

Control 43.9: Night Instrument Flight Rules (IFR)

Ensuring night surveys are conducted safely and in accordance with Instrument Flight Rules.

All night surveys must be conducted in accordance with all night, IFR requirements detailed in this Standard.

Control 43.10: Minimum Temperature

Reducing crew fatigue by ensuring survey operations are not conducted in extreme temperatures.

The minimum ground temperature for operations must be –35 degrees Celsius.

Control 43.11: Monitoring Radios

Ensuring aircraft radios are selected appropriately to enable safe flight operations.

Turn on radios and transponders during survey flights and select the appropriate ATC or area frequencies.

Control 43.12: Offshore Surveys

Ensuring overwater surveys take into account additional safety controls.

Offshore surveys, where the majority of the survey is over water, require additional controls. Include the following:

- HUET training for all crew in the preceding four years;
- Ten hours of initial offshore survey training with a pilot who has at least 100 hours offshore survey experience;
- Five hours offshore survey time in the last 90 days, or flight check in lieu;
- Basic Instrument Flight techniques including Unusual Attitude recovery training;
- Minimum weather conditions of 5nm visibility and 1,000 feet ceiling;
- Additional risk assessment (see BIG for details); and
- Satellite flight following with a minimum two minute reporting interval.

Control 43.13: Performance Monitoring

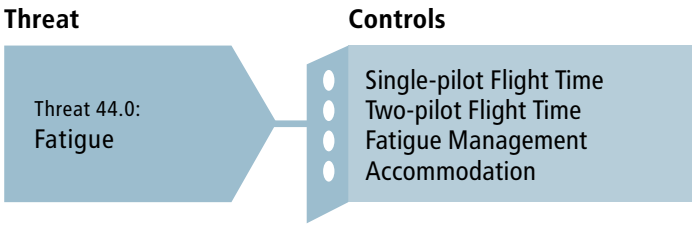
Ensuring compliance with minimum survey parameters.

Performance parameters including aircraft speed, height above terrain and drape must be periodically reviewed using data collected during the survey. Inspect deviations below minimum survey speed and minimum height. Take corrective actions to ensure deviations cease and the minimum safety margins are maintained. Determine the frequency of performance parameter reviews during the pre-start risk assessment.

Courtesy: Skyhorse Aviation

Threat 44.0: Fatigue

Fatigued flight crew make a poor decision in the high workload environment of low-level survey operations and this results in an aircraft accident



Control 44.1: Single-pilot Flight Time

Ensuring single-pilot fatigue is minimized.

In addition to BARS Control 1.9 and 1.10 (Flight and Duty Limits), limit single-pilot operations to five hours per day on actual survey (transit time excluded).

Control 44.2: Two-pilot Flight Time

Ensuring multi-crew fatigue is minimized.

In addition to BARS Control 1.9 and 1.10 (Flight and Duty Limits), limit two-pilot operations to eight hours per day on actual survey (transit time excluded).

Control 44.3: Fatigue Management Considerations

Ensuring flight crew fatigue is minimized by appropriate management and pre-start risk assessment.

Include fatigue management in the pre-start risk assessment to ensure appropriate mitigation has been planned for. Consider the following localized influences:

- Crew rotation;
- Time zone changes during rotation travel;
- Extreme climate;
- Effect of altitude;
- Camp conditions; and
- Rest facilities.

Control 44.4: Accommodation

Ensuring flight crew fatigue is minimized by the provision of appropriate accommodation.

Appropriate accommodation, including non-share single rooms when possible, must be included during the pre-start risk assessment that covers fatigue management. The risk assessment must cover the ability of flight crew to gain uninterrupted rest when temperature, noise, darkness and any other applicable local conditions are considered.

Defences 49.0

Mitigating defences in the event of an accident during survey operations

Defence 49.1: Satellite Flight Following

Ensuring that survey aircraft are equipped with satellite flight following and that appropriate back-up voice procedures are in place.

All survey aircraft must be tracked during survey using a satellite-based tracking system set at two minute reporting intervals and which is continuously monitored on the ground. Voice communications equipment must be available as back-up. If the satellite tracking system fails, an alternate means of flight following must be established that is acceptable to the aircraft operator and the company.

Defence 49.2: Local Flight Following

Ensuring the survey aircraft are subject to an appropriate flight following regime.

The aircraft operator must implement a flight following system for all survey flights that includes scheduled position reports, position logs maintained on the ground, operational flight plans and overdue/emergency response procedures.

Defence 49.3: Emergency Response Procedures

Ensuring adequate SAR and emergency response services are available in a timely and adequately resourced manner.

Emergency Response Procedures must be developed for each survey and be included as part of the pre-start operational risk assessment.

Defence 49.4: Flight Crew Clothing

Ensuring that flight crew protective clothing is appropriate to the operating conditions and environment.

All crew must wear appropriate clothing for survey operations including:

- Non-synthetic long trousers and long sleeved shirt or appropriate flying suit;
- Cotton undergarments;
- Robust, enclosed shoes; and
- Access to felt lined parka, hood and mittens (for cold weather operations).

Defence 49.5: Crew Helmets

Ensuring flight crew conducting extended low level operations have appropriate head protection.

When routinely operating below 500 feet above ground level flying helmets manufactured to appropriate industry standards must be worn by all crew members (unless a risk assessment states otherwise).

Defence 49.6: Survival Kit

Ensuring that in the event of an emergency, aircraft occupants have access to equipment and supplies to aid survival.

Carry a survival kit for all survey flights which is suited to the operating environment and includes a means to start a fire, a knife and a signaling mirror.

Defence 49.7: Life Jackets

Ensuring that in the event of an aircraft ditching, occupants can survive in the water.

Life jackets must be worn by all crew members if the survey is being conducted beyond autorotative or gliding distance from land.

Defence 49.8: Liferafts

Ensuring that in the event of an aircraft ditching, occupants can survive in a liferaft.

Provide dual chamber, reversible, liferafts for all crew members if the survey is being conducted beyond autorotative or gliding distance from land. Liferafts with a canopy and inflatable floor are preferred.

Defence 49.9: Underwater Escape Training

Ensuring that in the event of a helicopter ditching, occupants can survive if the helicopter submerges and/or capsizes.

For both fixed wing and helicopter surveys over water, all crew members must undergo underwater escape training that includes use of a Modular Egress Training Simulator (METS) within the previous four years (unless local regulation requires greater frequency).

Defence 49.10: Flight Crew PLB

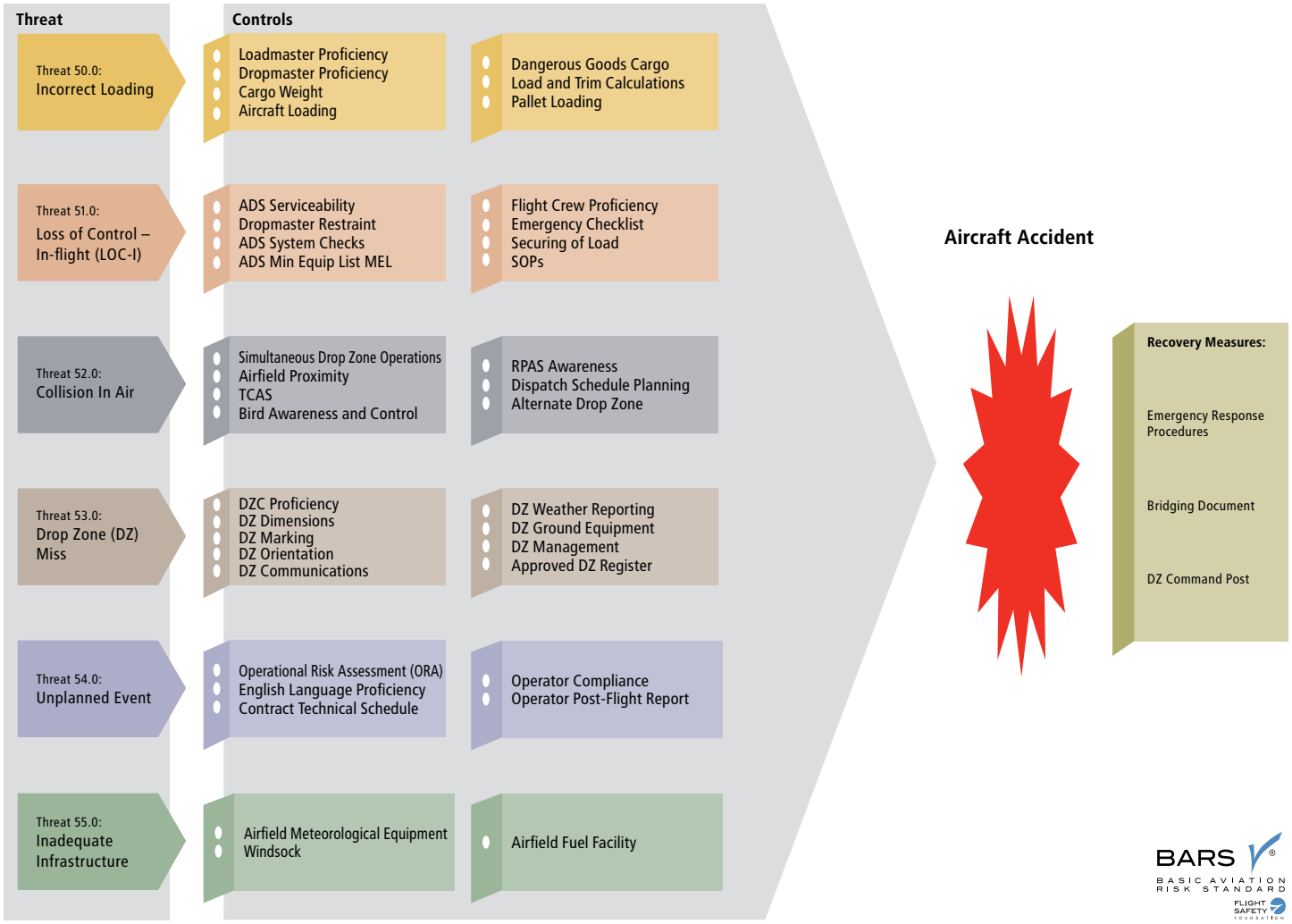
Ensuring timely alerting and location identification to aid SAR services.

Flight Crew operating in hostile environments must have access to a Personal Locator Beacon (PLB) that is either voice-capable or is accompanied with a satellite phone.

Air Drop

Air Drop

Figure 6: BARS Bow Tie Risk Model – Schematic of Aviation Risk Management Controls and Recovery Measures for Air Drop.

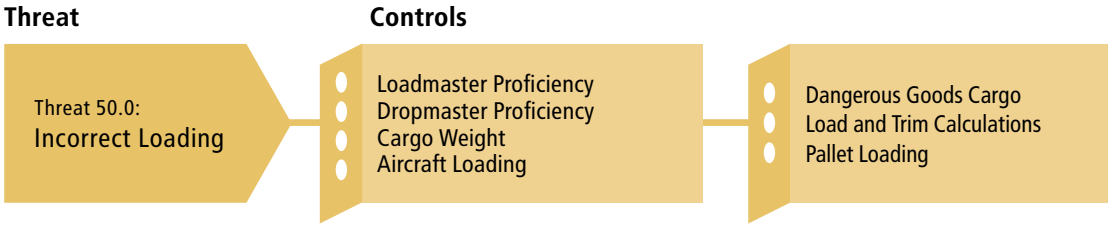


BARS BASIC AVIATION RISK STANDARD

Version 9, May 2022

Threat 50.0: Incorrect Loading

Incorrect loading of the aircraft results in an accident



Control 50.1: Loadmaster Proficiency

Ensuring the crew members are proficient and current for the operational roles assigned.

Loadmasters must be employed by the aircraft operator and their proficiency tracked through the aircraft operators system of training and checking. Qualifications, experience and recency listed in Table 1 must be met.

Control 50.2: Dropmaster Proficiency

Ensuring the crew members are proficient and current for the operational roles assigned.

Where Dropmasters are utilized in addition to a Loadmaster, the aircraft operator must have a documented approval process in place for each Dropmaster pertaining to the air delivery system in use. Experience requirements in Table 1 apply.

Control 50.3: Cargo Weight

Ensuring accurate cargo weights for air drop operations.

Bags prepared for aerial delivery must meet the nominated weight specification to avoid inadvertent overloading of the aircraft. Check a sample of bag weights (minimum 5% for each aircraft load) using calibrated scales located at the bagging facility prior to delivery to the aircraft. Confirmation of the sampling undertaken must accompany the waybill when provided to the Loadmaster.

Control 50.4: Aircraft Loading

Ensuring the aircraft is loaded correctly and in accordance with qualified crew instructions.

Aircraft must be loaded by personnel trained in aircraft loading and who are supervised by a Loadmaster and/or member of the flight crew at all times.

Control 50.5: Dangerous Goods Cargo

Ensuring DG are handled and loaded correctly and by qualified and current crew.

Cargo must comply with current IATA requirements associated with Dangerous Goods Regulations. All flight crew and Loadmasters must complete dangerous goods awareness training at least every 2 years.

Control 50.6: Load and Trim Calculations

Ensuring the aircraft remains within published W&B limits for all phases of flight.

The Pilot-in-Command must ensure the weight and center-of-gravity for the flight are within limits prior to takeoff, and are maintained during loading and dropping for full or partial load delivery operations.

Control 50.7: Pallet Loading

Ensuring the security and stability of palletized cargo throughout the flight and drop.

The bags prepared for dropping are required to be systematically arranged on each pallet to remain stable in-flight and during the delivery phase over the Drop Zone. Depending on the commodity being carried (cereal, pulses, CSB++ etc) this may mean the number of bags per pallet is limited for security and stability purposes. The Loadmaster is responsible for ensuring the pallet construction remains stable throughout all phases of flight.

Threat 50.0 (cont.)

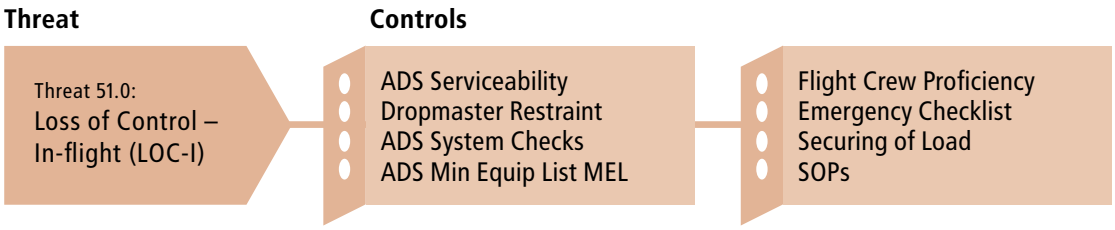
Table 1: Crew Member (Qualifications, Experience and Recency)

Crew Member	Qualifications	Experience and Recency
Pilot-in-Command	UNAVSTADS Table 4.2.4 and 4.2.5 Completed an initial documented air drop course provided by the AOC holder. Annual simulator training including procedural air drop and associated emergencies.	Five actual air drops on contract aircraft type. These may be achieved on contract (revenue flights) if operating with oversight of respective company standardization Pilot, Navigator, Loadmaster or Dropmaster (whichever applicable) for all five flights and assessed on completion. See Note 1 below. Crew Line Proficiency Check conducted annually (revenue flight) using company designated standardization Pilot, Navigator, Loadmaster and Dropmaster.
Co-pilot		
Navigator		
Flight Engineer		
Radio Operator		
Loadmaster		
Dropmaster	Approved training course in the Air Drop System in use.	

Note 1: Drop zones must meet minimum dimensions outlined in the WFP Air Drop Field Manual and operator's published and approved dimensions, whichever is more restrictive, for the Captain and Navigator position undergoing their first five drops.

Threat 51.0: Loss of Control – In-flight (LOC-I)

Crew actions and/or a non-standard load release place the aircraft outside the normal flight envelope leading to an unrecoverable flight condition



Control 51.1: Air Drop System (ADS) Serviceability

Ensuring the ADS remains serviceable via inspection and regular servicing.

The Air Drop System (ADS) on the aircraft must conform to the Original Equipment Manufacturer (OEM) servicing schedule that provides all necessary documentation associated with inspections, certification and serviceability. Copies of the servicing schedule must be made available in English.

Control 51.2: Dropmaster Restraint

Ensuring the protection of the dropmaster during ramp open flight.

Dropmasters must have an acceptable means of fall restraint that secures them to the aircraft anytime the ramp is open.

Control 51.3: ADS Preflight System Checks

Ensuring the ADS is fully operational pre-departure.

The aircraft ADS must be inspected by qualified personnel prior to each operational flight and using the servicing schedule outlined in 51.1. Any indication of unserviceability must be brought to the attention of the Pilot-in-Command prior to departure.

Control 51.4: ADS Minimum Equipment List (MEL)

Ensuring the ADS is functionally operational pre-departure.

The aircraft ADS must have a Minimum Equipment List (MEL) documented so that a clear Go/No-Go decision can be made by the Pilot-in-Command in the event any part of the system is not serviceable.

Control 51.5: Flight Crew Proficiency

Ensuring the flight crew are proficient and current for the operational role.

Flight crew must meet the qualifications, experience and recency listed in Table 1.

Control 51.6: Air Drop Emergency Checklist

Provision of standard procedures for non-normal and emergency situations are available to the crew and they are proficient in the understanding of such.

All Crew Members must have access to emergency checklist associated with Air Drop System malfunction and have received initial and recurrent proficiency training in accordance with Table 1.

Control 51.7: Securing of Load

Ensuring the load is secured in a timely fashion before departure.

Prior to taxi, all loads must be secured in accordance with prescribed loading and restraint schemes applicable for the size, weight and composition of the load.

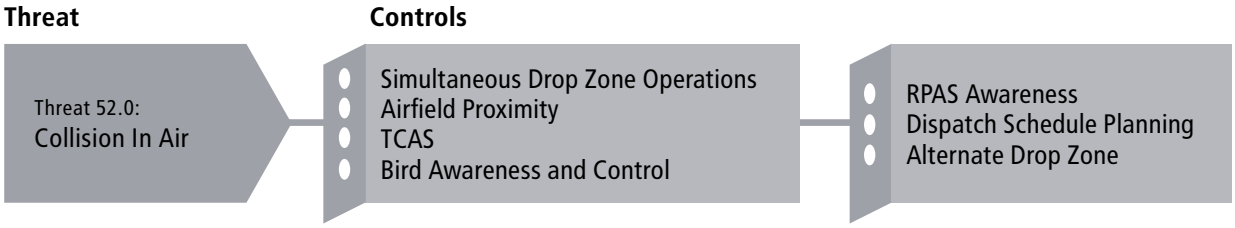
Control 51.8: Standard Operating Procedures (SOPs)

Provision of acceptable SOPs for the operational role and local environment/location.

The aircraft operator must have written Standard Operating Procedures accepted by the Authority outlining all crew actions engaged in the delivery of air drops. These procedures must be relevant to the local environment operated in as well as stores being delivered.

Threat 52.0: Collision in Air

An aircraft and object collide in air resulting in an accident



Control 52.1: Simultaneous Drop Zone Operations

Ensuring effective separation of other traffic around air drop operations.

If air drop operations to multiple Drop Zones that are within close proximity to each other (< than 20nm) are required, precise planning to ensure de-confliction of aircraft must occur. This may require restrictions on circuit direction, timing of drops, number of aircraft arriving at the same time or a combination of all three factors. The UNHAS Tasking Officer will coordinate this with all aircraft operators involved.

Control 52.2: Airfield Proximity

Ensuring effective separation of other traffic around air drop operations.

Drop Zones should not be planned within 5nm of an airfield. If operational needs necessitate a closer drop distance (less than 5nm), the activity must be risk assessed and at minimum all inbound and outbound traffic must stop during the duration of the air drop.

Control 52.3: Traffic Collision Avoidance System (TCAS)

Ensuring timely detection of conflicting air traffic to enable correct avoidance maneuvers and avoidance of other traffic.

Regardless of MEL allowances, the aircraft TCAS and at least one TCAS indicator, must be serviceable for all air drop missions.

Control: 52.4: Bird Awareness and Control

Ensuring flight crew awareness of known bird hazards.

The DZ Coordinator should provide advisory information to the aircraft anytime birds are in the area and considered a hazard at aircraft drop height (600 – 800 feet above ground level).

Control 52.5: Remote Piloted Aircraft System (RPAS) Awareness

Ensuring flight crew awareness of known RPAS operations.

Flight crew must be briefed on any proposed RPAS activity at the departure aerodrome, en route and in the vicinity of the Drop Zone. Where necessary, coordination procedures ensuring separation should occur prior to departure.

Control 52.6: Dispatch Schedule Planning

Ensuring effective and thorough planning with external parties prior to air drop operations.

When developing the schedule for air drop activities, awareness of all relevant parties conducting aviation activities in the area must be coordinated. This will include, but not be limited to, military organizations, national aviation authorities, national airspace authorities, other civil aid agencies, operators of Remote Piloted Aircraft Systems (RPAS) and ground-based aid organizations active in the DZ area.

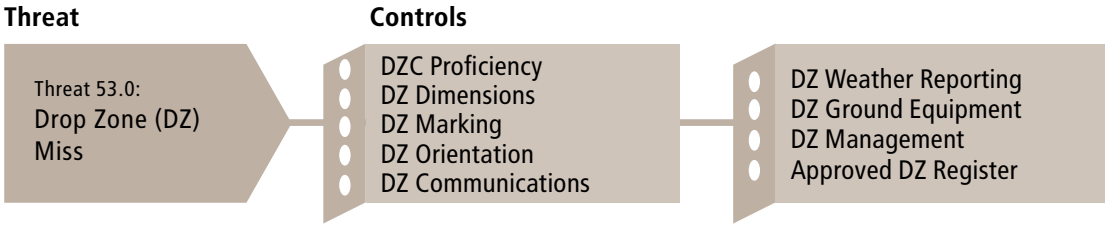
Control 52.7: Alternate Drop Zone

Ensuring effective planning to provide a suitable alternate DZ.

Where the suitability of a DZ is compromised by conflicting aviation activity and/or any safety-related reason, pre-briefing of an alternate drop zone may be planned so that any late changes to DZ location can be managed whilst achieving all operational risk assessment requirements beforehand. All necessary approvals required for DZ's must similarly be in place before accepting an alternate DZ.

Threat 53.0: Drop Zone (DZ) Miss

A deployed load misses the Drop Zone resulting in a fatality on the ground



Control 53.1: DZ Coordinator Proficiency

Ensuring the provision of suitable qualified ground crew in the DZ.

Drop Zone Coordinators (DZC) must have completed initial training that includes the WFP Air Drop Field Manual as part of the curriculum.

Control 53.2: DZ Dimensions

Ensuring the DZ meets minimum dimension criteria.

The dimensions of the DZ must meet the minimum requirements of the aircraft type being used for delivery. Where differing dimensions are provided (eg between WFP and aircraft operator), the greater of the dimensions shall be used.

Control 53.3: DZ Marking

Ensuring the flight crew can readily and clearly identify the correct DZ.

Marking of the DZ by the DZ Coordinator shall be conducted and will assist in visual sighting by the flight crew. Marking requirements by aircraft and operation type are contained in the WFP Air Drop Field Manual.

Control 53.4: DZ Orientation

Ensuring the DZ is oriented for safe entry/exit by the dropping aircraft.

Where possible, the DZ should be oriented to allow for the aircraft to approach into prevailing wind conditions. When these are not known, or not a factor, a North-South direction or alignment with surrounding terrain/vegetation should be used.

Control 53.5: DZ Communications

Ensuring a primary and secondary means of air-ground DZ communication.

The DZ Coordinator must have ground-to-air radio (VHF-AM) radio with back-up radio in addition to satellite telephone with back-up. A reliable means of battery recharging and/or a suitable number of spare batteries must be held on-site for the expected duration of the drop mission.

Control 53.6: DZ Weather Reporting

Provision of accurate wind information to the crew prior to drop.

The DZ Coordinator must have a means of measuring wind speed and direction and provide that information to the aircraft prior to commencement of the air drop.

Control 53.7: DZ Ground Equipment

Ensuring suitable DZ equipment prior to the drop.

The DZ Coordinator must have a complete and serviceable inventory of Drop Zone Equipment as outlined in the Air Drop Field Manual.

Control 53.8: DZ Management

Protection of locals during the drop.

The Drop Zone must be secured to ensure the local community or livestock remain clear of the area during air drop operations.

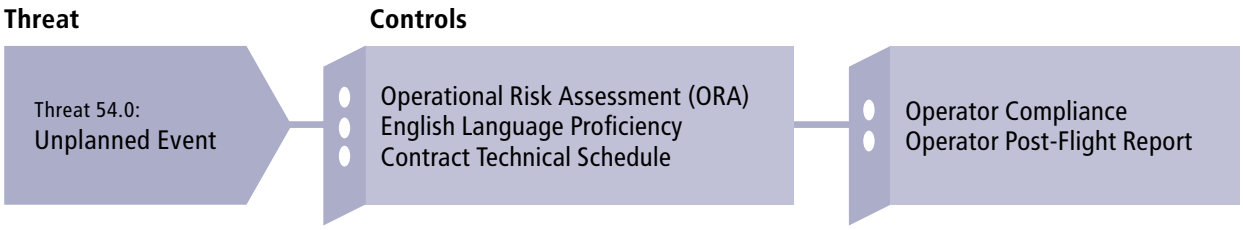
Control 53.9: Approved DZ Register

Creation of a collaborative and efficient register.

Document approved Drop Zones on a DZ register that is readily available to both the Humanitarian organizations and the aircraft operators performing the drops.

Threat 54.0: Unplanned Event

An unexpected event occurs that catches the flight crew and/or the DZ Ground Coordinator by surprise and results in an accident



Control 54.1: Operational Risk Assessment (ORA)

Ensuring a thorough and effective risk management process.

Prior to operating to a new DZ, conduct an ORA (or similarly named approval process) involving DZ Coordinators, Humanitarian organization and the aircraft operator.

Control 54.2: English Language Proficiency

Ensuring clear and unambiguous communication between the DZ and flight crew.

The Drop Zone Coordinator (DZC) and the flight crew member responsible for communications must have demonstrated English Language Proficiency (Level 4 as a minimum) for radiotelephony communication in accordance with ICAO Aviation English Language Test Services (AELTS).

Control 54.3: Contract Technical Schedule

Ensuring well defined legal contracts are in place.

The technical requirements outlined in the Air Drop Standard must be included as a technical schedule to the contract with the aircraft operator.

Control: 54.4: Aircraft Operator Compliance

Ensuring contracted operators and crews are familiar with international standards for air dropping.

The aircraft operator must have procedures and verification processes to make sure all operating crew understand and agree to all requirements contained within the contract technical schedule.

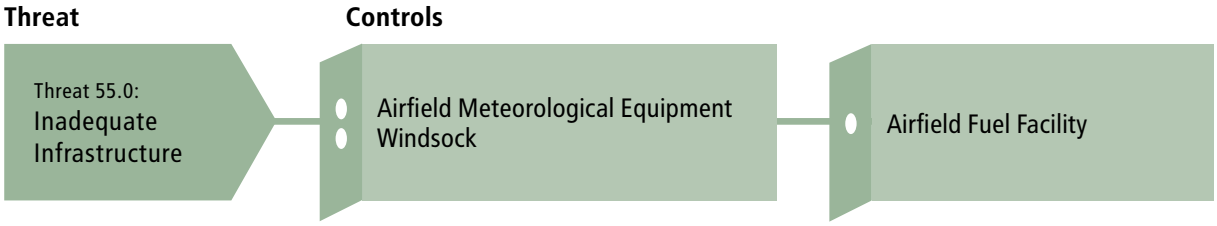
Control 54.5: Aircraft Operator Post-Flight Report

Ensuring a feedback mechanism for continuous improvement.

A post-flight report is to be completed by the Pilot-in-Command and Drop Zone Coordinator after each air drop mission and provided to the local UNHAS representative.

Threat 55.0: Inadequate Infrastructure

Poorly maintained or inadequate/absent infrastructure results in an accident on departure or arrival



Control 55.1: Airfield Meteorological Equipment

Ensuring suitable weather information is available to the crew for departure and arrival airports.

For all airfields where aircraft involved in air drop operations operate from, provide the following information from calibrated equipment before every takeoff and landing:

- Wind direction and speed;
- Barometric pressure; and
- Temperature.

Cloud ceiling height and visibility information is highly desirable for arriving aircraft, particularly in areas of inclement weather as experienced during wet seasons.

Control 55.2: Windsock

Ensuring suitable weather information is available to the crew for departure and arrival airports.

A minimum of one serviceable windsock is to be maintained throughout an air drop campaign at the airfield where the air drop aircraft are operating from.

Control 55.3: Airfield Fuel Facility

Ensuring suitable fuel supplies are available in support of air drop operations.

Prior to operational start-up, the aircraft operator is to conduct a review of the fuel facilities providing fuel for operations to determine acceptability.

Defences 59.0

Mitigating defences in the event of an accident

Defence 59.1: Emergency Response Procedures

Provision of suitable and relevant ERP for all stakeholders involved with the air drop operation.

All organizations involved in an air drop must have up-to-date Emergency Response Procedure appropriate for an in-flight or on-ground emergency as a result of an air drop.
This will include WFP Logistics, the aircraft operator, UNHAS and WFP ASU.

Defence 59.2: Bridging Document

Ensuring suitable communications are in place for each air drop operation.

A bridging document detailing the lines of communication between aircraft operator, WFP Logistics and UNHAS must be made available for each air drop activity.

Defence 59.3: DZ Command Post

Ensuring the DZ command post is established and functionally capable of initiating the emergency response.

A DZ Command Post must be established for all air drop activities and ideally be situated upwind of the drop zone and outside the exclusion zone. The Command Post must have line-of-sight of the DZ, hold all communications with ground and air resources and be in a position to initiate emergency response if required.

Pursuing the continuous improvement of global aviation safety and the prevention of accidents

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Version 9, May 2022