Helicopter Load

Lifting Manual
Table of Contents

1. AIM .................................................................................................................................................. 3

2. RESPONSIBILITIES .......................................................................................................................... 3
   2.1 THE PROJECT DIRECTOR ........................................................................................................... 3
   2.2 FLIGHT OPERATIONS MANAGER ............................................................................................. 3
   2.3 BAITING OPERATIONS MANAGER ........................................................................................... 4
   2.4 LOAD SITE CONTROLLER .......................................................................................................... 4

3. QUALIFICATIONS .................................................................................................................................. 5
   3.1 PILOTS ............................................................................................................................................ 5
   3.2 LOAD SITE CONTROLLER .......................................................................................................... 5
   3.3 AIRCRAFT ..................................................................................................................................... 5
   3.4 LIFTING STROPS AND CARGO NETS ....................................................................................... 5
   3.5 RADIO COMMUNICATIONS EQUIPMENT ................................................................................. 5

4. OPERATIONAL PROCEDURES .......................................................................................................... 6
   4.1 WHEN LIFTING OFF SHIP .......................................................................................................... 6
   4.2 RECEIVING SITE OPERATIONS ............................................................................................... 6
   4.3 HELICOPTER OPERATIONAL LIMITS ...................................................................................... 6
   4.4 AIRCRAFT REFUELLING ............................................................................................................. 7
   4.5 UNAUTHORISED PERSONNEL ................................................................................................. 7
   4.6 INCIDENT REPORTING ................................................................................................................ 7
   4.7 SUSPENSION OF OPERATIONS ............................................................................................... 7
   4.8 BIOSECURITY .............................................................................................................................. 8
   4.9 MEDIA LIASON ............................................................................................................................ 8
   4.10 OPERATIONAL RECORDS ....................................................................................................... 8

5. SECURITY OF AIRCRAFT .................................................................................................................... 9

6. CONFIDENTIALITY ............................................................................................................................. 9

7. DEPARTURE FROM PROCEDURES IN THIS MANUAL .................................................................. 9

8. QUALITY ASSURANCE .................................................................................................................... 9

9. DEFINITIONS ..................................................................................................................................... 10

APPENDICES ......................................................................................................................................... 11

   Appendix 1 - HAZARD IDENTIFICATION ....................................................................................... 11
   Appendix 2 - PERSONAL PROTECTION EQUIPMENT .................................................................. 13
   Appendix 3 - LOAD SITE STAFF TRAINING .................................................................................. 14
   Appendix 4 - MAXIMUM LOAD LIFT WEIGHTS ........................................................................... 16
   Appendix 5 - HELICOPTER LIFTING HAND SIGNALS ................................................................. 17
   Appendix 6 - LIFTING PROCEDURES CHECKLIST ..................................................................... 18
1. AIM

To reduce risk and enhance the safety of all personnel involved in helicopter lifting operations during Habitat Restoration Project fieldwork by (a) identifying hazards and mitigation measures, (b) specifying appropriate PPE and training, and (c) defining roles, responsibilities and procedures.

2. RESPONSIBILITIES

2.1 The Project Director

Will:

A. Ensure that all pilots and crew are thoroughly trained in load construction and slinging techniques, safety requirements and procedures and that they hold the relevant qualifications for the operation.
B. Appoint a Flight Operations Manager (FOM) who will be responsible for all personnel and procedures at the operation site.
C. Make himself available to the FOM in the event of any occurrence where safety is compromised.
D. Ensure all equipment that is to be used for lifting operations is fit for purpose.
E. Provide the flight crew with suitable maps of the areas where lifting operations are to be carried out.
F. Designate a Deputy Project Director (DPD) to assume the PD's role in the event of the PD's absence
G. Designate a pool of suitably trained staff who can act as Site Controllers.
H. Establish a system of identifying, promulgating and mitigating hazards to safety (Appendix 1).

2.2 Flight Operations Manager

Will:

A. Have a thorough briefing with the Project Director, Vessel Master (when appropriate), Baiting Operations Manager, Load Site Controllers, pilots and any personnel directly involved, prior to the commencement of any operation and agree all aspects including:

- Operational weather minima
- Radio communication channels and frequencies
- Load weight limits
- Refuelling requirements
- GSGSSI and BAS safety and procedural requirements
- SGHT safety and procedural requirements

C. Ensure all Ground Support personnel and pertinent ship's crew are thoroughly briefed in all aspects of the operation.
D. Report any incidents directly to the Project Director
2.3 Baiting Operations Manager

Will:

A. Be responsible to the FOM and the Project Director
B. Be responsible for safety on and around the loading sites
C. Ensure that all GSGSSI, BAS (including ship) and SGHT safety procedures and requirements are adhered to, in the absence of the FOM from the operational loading areas.
D. Appoint a Load Site Controller for each active loading and receiving site
E. Ensure that communications can be maintained between Load Site Controllers and all operating aircraft.

2.4 Load Site Controller

Will:

A. Ensure that any loads to be lifted are assembled in such a way as to be stable in flight.
B. Ensure that all personnel in the loading site zone have the appropriate PPE.
C. Ensure that all other Ground Support crew are familiar with loading techniques, refuelling techniques and any other safety aspects.
3. QUALIFICATIONS

3.1 Pilots

A. Must hold current commercial helicopter licence and be rated on aircraft type.
B. Must have satisfied the Flight Operations Manager of his competency in the use of long line techniques.
C. Meet any other requirements stipulated by either the Project Director or FOM.

3.2 Load Site Controller

A. Must meet any requirements stipulated by the Flight Operations Manager, Baiting Operations Manager, Vessel Master and Project Director.
B. Must have been trained on duties and responsibilities (see Appendix 3)

3.3 Aircraft

A. Must meet all CAA requirements for type of operation being undertaken.
B. Must have an approved cargo hook with electric and back-up manual release controls.
C. Must be fitted with two-way radio communications to the Load Site Controllers and, where necessary, the ship.
D. Must be fitted with satellite tracking equipment to provide real-time flight following.

3.4 Lifting strops and cargo nets

A. Must be certified & in date
B. Must capable of carrying 1.5 times the maximum weight to be lifted and suitable for the load.
C. Lifting strops must be fitted with an open hook and suitable weight at the bottom of the line to stop the line from flying up when being flown without load attached.
D. Must be inspected daily before use, when possible during service, and always after an incident.
E. Must be free from any obvious damage – any suspect gear must be removed immediately from service.
F. Shall arrive at operational site free of contaminants.

3.5 Radio Communications Equipment

A. Must be set at prearranged channels or frequencies.
B. Must be checked daily prior to commencement of lifting operations.
C. Back-up radios must be available at each loading or operational site in case of radio failure.
4. OPERATIONAL PROCEDURES

4.1 When lifting off ship

A. The ship will follow procedures in the Ernest Shackleton Helideck Manual
B. The Load Site Controller is responsible for preparing a lifting plan together with the Project Director, FOM, Baiting Operations Manager, covering load identification, actual load weights and lifting sequence.
C. The senior operational pilot (Lead Pilot) must establish a suitable flight circuit from the lift site (ship) to the receiving site.
D. Before approaching ship loading site, communication with shipboard Load Site Controller must be established by radio or, failing that, visually (hand signals - see Appendix 5).
E. Prior to approving the aircraft approach, Load Site Controller must establish that all loading staff are ready for receiving the strop and hook and that there are no loose objects or material that may affect the lifting operation.
F. Once the helicopter is at a stable hover over the load and the hook has been attached, the Load Site Controller can communicate to the pilot that the load is free to lift.
G. Wherever possible, aircraft shall avoid flying over areas where sensitive wildlife are located when transiting to and from the operational area.
H. Wherever possible loads should be lifted with the aircraft positioned ‘into wind’.
I. Where a load becomes unstable during flight the pilot must reduce speed immediately to a speed at which the load stabilises. If stability cannot be achieved the load must be jettisoned.
J. At any time that the PD, FOM, Baiting Operations Manager, vessel Master or vessel Safety Officer believe that the operation has become unsafe then the operation must be stopped.
K. Load Site Controller to ensure that all loading site staff have the appropriate PPE.
M. Load Site Controller should keep in mind that the helideck may be needed urgently for helicopter landing in case of emergency.

4.2 Receiving Site Operations

A. Receiving Load Site Controller shall ensure that all ground staff are ready to receive an incoming load and communicate this fact to the incoming aircraft.
B. Receiving Load Site Controller must establish that no loose material that may affect the safety of the operation is left around the site.
C. No site staff are to position themselves directly under the load at any time.
D. Receiving Load Site Controller to ensure that all site staff have the appropriate PPE.

4.3 Helicopter Operational Limits

These are the operational limits for lifting operations.

A. Maximum continuous wind speed 20 knots
B. Maximum wind gust 35 knots
C. Minimum visibility 1000 metres
D. Minimum cloud base 500 feet
E. More than 10 degrees pitch or roll or 3 metre deck heave.
F. A lower limit above which the FOM, FSM, PD or a pilot believes the operation is unsafe.
G. Load maximum weights. See Appendix 4

4.4 Aircraft Refuelling

A. Only trained and authorised personnel shall refuel the aircraft.
B. Appropriate safety equipment is to be used as identified in Appendix 3
C. The ‘Refuelling Site’ should be set up in a location that doesn’t obstruct the approach or departure paths for the Receiving or Loading sites.

4.5 Unauthorised Personnel

A. No unauthorised personnel shall be allowed onto the operational area.
B. Those personnel not engaged directly in project work as defined by the Project Director, will be unauthorised
C. Such non-project workers shall be given clear briefings and limits relating to their activities around the operational area, to ensure that they do not obstruct, even unwittingly, the operations in progress.
D. If unauthorised personnel enter the operational area the Load Site Controller shall suspend the operation until the operational area has been cleared.
E. It will be the Project Director’s (or his delegate's) responsibility to ensure unauthorised personnel are removed from the operational area.

4.6 Incident Reporting

A. Any incidents that occur during the operation should be immediately reported to the FOM. The FOM is to determine what immediate measures are required in consultation with the Project Director.
B. The FOM is to report any incidents verbally to the Project Director as soon as possible and in writing within 24 hours.
C. The Project Director will liaise with SGHT staff, the vessel Master, GSGSSI and BAS, as appropriate, to establish the nature and extent of any incident.
D. Any Accident, Incident, Near Miss, or Environmental occurrence within 50 yards of the ship must be reported through the BAS AINME system.

4.7 Suspension of Operations

The PD, FOM, Baiting Operations Manager, Vessel Master, Vessel Chief Officer, or any Load Site Controller may suspend operations if there are any safety compromises or departures from approved procedures. Any such suspension should be verbal initially but will later require documentation of:

i. Date and time of suspension
ii. Reason
iii. Rectification measures
iv. Date and time of lifting of suspension
v. Authorising personnel
Copies of suspension notices are to be served to or by the Project Director or his representative as soon as possible.

4.8 Biosecurity

A. Biosecurity measures as detailed in the SGHT Habitat Restoration Biosecurity Plan will be implemented throughout helicopter operations to prevent the transfer of invasive species between operational sites. The project’s Environmental Officer will ensure these are implemented.

4.9 Media Liaison

All media enquiries to any flight or ground staff are to be referred to the Project Director.

4.10 Operational Records

A. At completion of each day of operations, the FOM will provide the Project Director with a record of:
   
   i. Aircraft flight times for all aircraft movements
   ii. Total number of loads
   iii. Hazards identified
   iv. Incidents identified

B. At the completion of each day of operations, the Loading Site Controller will provide the FOM with a record of:
   
   i. Total number and type of loads (baiting, staff transfer / operational)
   ii. Hazards identified
   iii. Incidents identified

C. Copies of operational records shall be made available daily to the Vessel Master.
5. SECURITY OF AIRCRAFT

The security of the aircraft is paramount at any time. The following measures will be taken as appropriate:

A. When wind gust exceed 30 knots, aircraft must be parked in the secure areas established.
B. If forecast winds are expected to exceed 40 knots, the aircraft must be parked at established secure sites with appropriate anchor points and tie down facilities.
C. Covers must be placed over the front screen and air intakes.
D. Main and tail rotor blades will be securely tied.

6. CONFIDENTIALITY

This manual is for use by South Georgia Heritage Trust personnel and as a reference for GSGSSI and BAS. Disclosure of this document to other than those authorised by the Project Director is prohibited.

7. DEPARTURE FROM PROCEDURES IN THIS MANUAL

7.1 Departure from the procedures of this manual by any person shall be treated as a breach of procedures. Any departures are to be reported to the Project Director in writing within 24 hours by the FOM.

7.2 Notwithstanding that in an emergency any personnel may take the appropriate measures required and will submit a written report to the Project Director within 24 hours.

7.3 The Project Director may amend this Manual at any time, subject to ensuring that all affected personnel are aware of the amendments.

8. QUALITY ASSURANCE

Only experienced pilots will be used on any aerial lifting operations carried out by South Georgia Heritage Trust.

Quality management systems will be implemented to ensure that operations provide optimum results while ensuring operations are conducted in a safe and efficient manner and within any legislation pertaining to those operations.
### 9. DEFINITIONS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOAD SITE - SHIP</td>
<td>The site, normally the helideck and after hatch of the RRS <em>Ernest Shackleton</em>, where loads are uplifted by the helicopters.</td>
</tr>
<tr>
<td>BAS</td>
<td>British Antarctic Survey</td>
</tr>
<tr>
<td>BOM</td>
<td>Baiting Operations Manager</td>
</tr>
<tr>
<td>DPD</td>
<td>Deputy Project Director</td>
</tr>
<tr>
<td>FOM</td>
<td>Flight Operations Manager</td>
</tr>
<tr>
<td>GROUND SUPPORT CREW</td>
<td>All personnel involved in ground operations around the helicopter at the loading site</td>
</tr>
<tr>
<td>GSGSSI</td>
<td>Government of South Georgia and South Sandwich Islands</td>
</tr>
<tr>
<td>INCIDENT</td>
<td>Any occurrence which compromises safety</td>
</tr>
<tr>
<td>LOAD SITE</td>
<td>An area with a radius of 30 metres centred on a site at which loads are picked up or deposited by helicopters, extending out to 50 metres in the direction of the take-off path.</td>
</tr>
<tr>
<td>LOAD SITE CONTROLLER</td>
<td>Suitably trained staff designated to coordinate activities at a load site</td>
</tr>
<tr>
<td>PD</td>
<td>Project Director</td>
</tr>
<tr>
<td>PPE</td>
<td>Personal Protection Equipment</td>
</tr>
<tr>
<td>SGHT</td>
<td>South Georgia Heritage Trust</td>
</tr>
<tr>
<td>SP</td>
<td>Senior Pilot</td>
</tr>
<tr>
<td>SENIOR CREWMAN</td>
<td>Senior Ground Crewman as appointed by FOM</td>
</tr>
</tbody>
</table>
APPENDICES

Appendix 1 - HAZARD IDENTIFICATION

Note – In the event of an incident as a result of helicopter operations on the Ernest Shackleton, the ship is prepared for and will follow the contingencies set out in section ES.15 Helideck Contingencies, of the Ernest Shackleton Emergency Plan.

Crushing injury Those affected - Ground Personnel

Safety measures
1. Never place yourself directly underneath the load.
2. Be aware that the load may swing in any direction.
3. Never turn your back on a load.
4. Appropriate PPE.

Helicopter blades, tail rotor, exhaust Those affected - Ground Personnel

Safety measures
1. Only approach from front.
2. Do not approach while starting or stopping.
3. Do not approach from uphill side.
4. Do not approach without invitation from pilot.

Loose objects, dust etc. from rotor wash Those affected - Ground Personnel

Safety measures
1. Goggles
2. Secure all loose items on loading site.
3. Secure loose clothing, e.g. hats

Aircraft movements Those affected - Ground Personnel

Safety measures
1. No unauthorised personnel in operational area.
2. Only trained personnel allowed at loading site.
3. Always be aware of the hook on the end of the strop as it can swing unpredictably

Aircraft refuelling Those affected - All Personnel

Safety measures
1. Only trained personnel to refuel aircraft.
2. Appropriate fire-fighting equipment to be readily available and staff trained
Helicopter noise

**Those affected - All Personnel**

**Safety measures**

1 Ear defenders.

Wires or obstructions in the operation area

**Those affected - Aircraft Crew**

**Safety measures**

Project Director, Baiting Operations Manager or Load Site Controller must advise pilot of any obstructions that may jeopardise the safe completion of the operation.

Helicopter Ditching

**Those affected - Aircraft Crew**

**Safety measures**

1 Pilots to wear immersion suits & life-jackets for over-water operations. No passengers to be on aircraft during under slinging operations, unless required for management of the load (not for over-water operations).

2 Ships boat (RIB) must be on standby during shipboard lifting operations

Fatigue

**Those affected - All Personnel**

**Safety measures**

Close monitoring by FOM

Manual Handling

**Those affected - All Personnel**

**Safety measures**

1 Appropriate PPE

2 Mechanical assistance where possible

3 Training given for particular tasks involving common sources of injury, such as handling fuel drums

Bait boxes dropped or split on deck

**Those affected - Ground Personnel**

**Safety measures**

1 Goggles & Appropriate PPE

2 Respirators if significant quantities of dust

3 Bait is non-hazardous so can be cleaned up by suitably attired personnel wearing gloves, goggles, and respirators if necessary.
Appendix 2 - PERSONAL PROTECTION EQUIPMENT

Pilots

1. Safety helmet  
2. Gloves  
3. Survival suit  
4. Life jacket for overwater operations

Loading/Receiving Site staff

1. Hard hat  
2. Ear muffs and/or ear plugs  
3. Goggles  
4. Overalls  
5. Steel toe-capped boots  
6. Gloves  
7. High visibility vests if overalls not white

Load Site Controllers

1. All of the items listed for Load Site Staff if he/she will be in the immediate area of the helicopter loading site.  
2. A suitable helmet-mounted radio headset for communication with operational helicopters.  
3. High visibility vest.

Loading Site Safety and Crash Rescue Equipment

1. 2 x fire extinguishers  
2. First aid kit  
3. Shovel  
4. Crash axe  
5. 2 x crowbars  
6. 2 x pair fire resistant gloves  
7. 2 x fire blanket  
8. 1 pair bolt cutters  
9. Fuel spill kit  
10. Knife or other tool to cut seat-belts

Ship rescue boat should be on standby.
Appendix 3 - LOAD SITE STAFF TRAINING

Aims

To ensure that all personnel involved in working around the loading/receiving sites are aware of the risks and their responsibilities relating to those risks.

Responsibility

It shall be the responsibility of the

A. Project Director to ensure that only adequately trained personnel are approved to carry out duties on and around the helicopter loading site.
B. BOM to carry out the necessary training of the Load Site Staff
C. BOM & Load Site Controllers to monitor load lifting operations for safety compliance.

Procedure

A. Familiarisation with equipment and Procedures Manual
   i. Viewing the strops, cargo nets and cargo hook connections to the helicopter, discussing hazards associated with its use.
   ii. Viewing the helicopter in a static state, discussing the safety issues of working around the loading/receiving sites and in particular the hazards associated with the main and tail rotors, static electricity and the dangers of working with strops and nets in a confined area including secure footing especially on the ship.

B. Required safety equipment
   i. Minimum required safety equipment, demonstrating how and when it is to be used.
   ii. Risks associated with using the safety equipment, e.g. reduced visibility/hearing
   iii. The duties you are responsible for implementing in your position

C. Responsibilities
   i. The need to be responsible for your own safety and vigilant regarding safety of your team members.
   ii. Chain of responsibility, i.e. who you report to.
   iii. Sign off that hazards have been identified and are accepted, and that stated mitigation measures will be taken.

D. Practical demonstration
   i. Using the helicopter in the hovering position when hooking and unhooking loads
ii. Pointing out the hazards created in this operation

E. Accident and incident reporting
   i. What to report
   ii. Who to report to
   iii. Appropriate template or form to use

F. Debrief
   Discussing all the hazards identified in the previous section.

G. Issuance of approvals to act as Ground Support Crew (Form SG300 as amended)
Appendix 4 - MAXIMUM LOAD LIFT WEIGHTS

The maximum load lift weight for any given load may differ with different operational conditions.

Each aircraft has a different ‘empty aircraft’ weight due to different equipment fitment etc. so for each aircraft ‘actual maximum lift weights’ need to be calculated using the specific aircraft Weight and Balance spread sheet.

The figures below are an indication only and use a 90kg pilot and the current empty aircraft weight data for G-TVAM in the calculations.

Assumption - fuel burn of 210 litres per hour.

<table>
<thead>
<tr>
<th>Time</th>
<th>Main Fuel Tank</th>
<th>Max Hook Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>2hr fuel load</td>
<td>346kg</td>
<td>387kg</td>
</tr>
<tr>
<td>1hr fuel load</td>
<td>256kg</td>
<td>477kg</td>
</tr>
<tr>
<td>1hr fuel load</td>
<td>166kg</td>
<td>567kg</td>
</tr>
<tr>
<td>0.5hr fuel load</td>
<td>80kg</td>
<td>653kg</td>
</tr>
</tbody>
</table>
Appendix 5 - HELICOPTER LIFTING HAND SIGNALS

**HOLD**
Clench both hands, forearms vertical.

**RAISE (LIFT)**
Arms extended, palms UP, arms sweeping upwards.

**LOWER (PRESS)**
Arms extended, palms DOWN, arms sweeping downwards.

**TO THE LEFT**
Bend and straighten arm.

**TO THE RIGHT**
Bend and straighten arm.

**MOVE BACK (PUSH)**
With palms facing forward, raise and lower forearms.

**MOVE FORWARD (PULL)**
With the back of hands facing forward, raise and lower forearms.

**DROP (RELEASE LOAD)**
Cross and uncross arms in front of the body.
## Appendix 6 – LIFTING PROCEDURES CHECKLIST

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Weather and wind check</td>
</tr>
<tr>
<td>2</td>
<td>Flight pattern and approach departure paths</td>
</tr>
<tr>
<td>3</td>
<td>Lifting crew briefing on operational and emergency procedures</td>
</tr>
<tr>
<td>4</td>
<td>Review of rigging, loading and hook-up procedures including an inspection of lifting equipment</td>
</tr>
<tr>
<td>5</td>
<td>Test of communications systems and hand signals</td>
</tr>
<tr>
<td>6</td>
<td>Confirmation of loading sequence</td>
</tr>
<tr>
<td>7</td>
<td>Review of methods for ensuring correct load weights</td>
</tr>
<tr>
<td>8</td>
<td>Review of PPE</td>
</tr>
<tr>
<td>9</td>
<td>Inspection of load sites for loose debris</td>
</tr>
<tr>
<td>10</td>
<td>Pilot checks of electric and back-up manual hook release controls</td>
</tr>
</tbody>
</table>