Revision 4.0
January 2022

# Shell Group Requirements for Aircraft Operations (SGRAO)

AIRCRAFT OPERATOR REQUIREMENTS

Shell Aircraft

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## Shell Group Requirements for Aircraft Operations – Air Operator Requirements, Version 4

The Shell Group Requirements for Aircraft Operations (SGARO) – Air Operator Requirements (AOR), Version 4 (V4) is now structured as follows:

- There are only “Mandatory Requirements”, as before written in present tense.
- V4 no longer lists “Means of Compliance” (MoC).
    - These have either been lifted into requirements (where necessary from a risk perspective) or have been included as Guidance.
    - Guidance does not serve as audit criteria and thus will not be a subject for individual audit findings.
- For Offshore Helicopter Operations, V4 has been structured to accurately reflect the International Oil and Gas Producers (IOGP) Offshore Helicopter Recommended Practices (OHRP) Document R690.
- In some areas, the order or text have been changed to make the wording align with the Control Framework writing style.
- Where Shell specific text has been added, it is highlighted in Yellow for ease of identification/reading.
    - This text is in areas where we felt that 690 did not fully address our risks, needed more explanation, or to add some specific items based on Shell experience.
    - Where the 690 text reads as guidance, which has been integrated as such, and is highlighted in Blue.
- Words in Green Text are in a separate **glossary**.
- Where there was overlap between aeroplane and helicopter operations, some aeroplane applicable sections, such as Engineering areas have been changed to align with the IOGP OHRP R690.
    - A full review of these areas against aeroplane requirements and Version 3.2 (V3.2) of the SGARO AOR have been carried out, and any changes are not material.

There are, however, areas were the IOGP Recommended Practices are still under development, such as Fixed Wing (Aeroplane) operations, and the Special Operations (SPO) requirements. In V4, these latter areas are a cleanup of the V3.2 documents while work in the IOGP R690 Workgroup continues. The SGARO will be updated as the remaining sections of IOGP R690 are published.

There are also sections in the documents that will be subject to future development, such as Shell Aircraft Bowtie references.

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# TABLE OF CONTENTS

# ENG Engineering Requirements ENG-1

# FAC Facility Requirements - Passenger Handling FAC-1

| | |
|---|---|
| | Shell specific text |
| | 690 text reads as guidance |

# TABLE OF CONTENTS

## SAF 00.00 Safety Management Systems – General

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-3:**

1. Implement an effective Safety Management System (SMS), appropriate to the size and complexity of the company and incorporating all elements of SAF 00.00 through SAF 04.00 to manage significant safety risks to ALARP levels.
2. Demonstrate how SMS components and elements meet NAA regulatory requirements and meet the intent of ICAO Annex 19, 2nd Edition July 2016 - Appendix 2 - Framework for an SMS, and ICAO Doc 9859, Safety Management Manual (SMM), 4th Edition, 2018, including in those countries where national regulations for SMS are not in place for the class of operation or activity; and
3. Demonstrate how the SMS interlinks all the elements listed in SAF 00.00 through SAF 04.00 and how the relationships have been effectively implemented within the organisation to allow safety information to circulate freely and continuous improvements to be made.

### GUIDANCE

1. ALARP is defined as “The point at which the cost (in time, money and effort) of further Risk reduction is grossly disproportionate to the Risk reduction achieved”.
2. No further guidance.
3. The SMS should demonstrate interlinked processes that allow safety information to circulate freely and system improvements to be made (see Figure 1, overall SMS and Figure 2, Hazard Management).

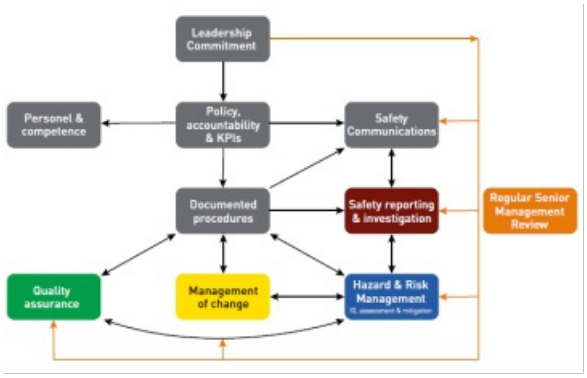


**Figure 1 - Overall SMS**

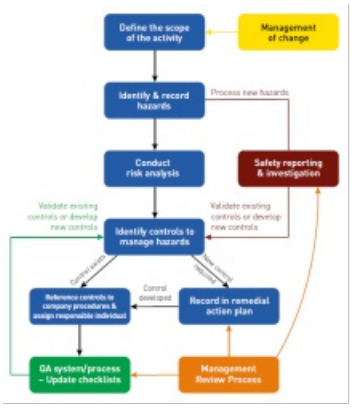


**Figure 2 – Hazard Management**

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

The purpose of each of SAF sections is described below. Mandatory requirements and the associated guidance are expanded in the individually numbered SAF sections

- **SAF 01.00 Policy, Objectives and Management Review – Safety Communication**:
  - To define the organisation's safety policy based on a Just Culture that incorporates objectives targets and plans.
- **SAF 01.01 Management Commitment and Leadership**:
  - To create and sustain a culture that drives commitment of no harm to people.
- **SAF 01.02 Safety Accountabilities and Responsibilities**:
  - To establish and maintain an organisation that enables compliance with the Safety Policy and objectives.
- **SAF 01.03 Key Safety Personnel Competence Training and Education**:
  - To manage and assure the competence of people working with safety risks.
- **SAF 01.04 Emergency Response Planning and Management**:
  - To plan and prepare for emergency responses to incidents that mitigate the consequences and enable resumption of normal operations.
- **SAF 01.05 SMS Documentation**:
  - Documented, detailed procedures covering all activities and processes and more broadly documented procedures for safety critical tasks related to aircraft operations.
- **SAF 02.00 Safety Risk Management**:
  - To establish a Hazard and Effects Management Process (HEMP) to identify safety hazards and to reduce the Risks to As Low As Reasonably Practicable (ALARP).
- **SAF 02.01 Incident Reporting, Investigation and Learning**:
  - To log, investigate and learn from incidents.
- **SAF 03.00 Continuous Improvement - Assurance**:
  - To provide assurance that the SMS requirements are implemented and effective.
- **SAF 03.01 Safety Performance Monitoring**:
  - To collect safety performance data including Safety Performance Indicators (SPIs) that are relevant, consistent, transparent, accurate and complete, for consolidation by leadership for internal review.
- **SAF 03.02 Management of Change**:
  - To manage safety risks resulting from unforeseen consequences of changes.
- **SAF 04.00 Environmental Management;**
  - To effectively manage environmental concerns.

## REFERENCES


- ICAO Annex 19, 2nd Edition July 2016 — Appendix 2 — Framework for an SMS.
- ICAO Doc 9859, Safety Management Manual (SMM), 4th Edition, 2018.
- UK CAA CAP 795 SMS Guidance for organisations — February 2015.


## RELATED INCIDENT

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-1 SMS, 1. Safety Management System — General.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## SAF 01.00 Policy and Objectives and Management Review – Safety Communication

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-7:**

1. Provide a Safety Commitment and Policy Document, based on a Just Culture, with clear responsibilities for safety management. The policy:
    - Signed by the Accountable Executive of the organisation;
    - Actively encourages effective reporting by defining a Just Culture, which encourages people to provide essential safety-related information, and describes the boundary between acceptable and unacceptable performance where people are not blamed for honest errors and mistakes, but they are held accountable for willful violations and gross negligence;
    - Communicated, with visible endorsement, throughout the organisation; and,
    - Reviewed on a yearly basis to ensure it remains relevant and appropriate to the company.
2. Monitor and share safety information which is reviewed by Management.
3. Develop and implement a range of safety promotion and communication processes to enable an effective flow of information throughout the company.
4. Establish formal meetings where all staff can engage in discussion on safety topics either directly or through appropriate representation.
5. Schedule a yearly management review process, based on a defined hierarchy of meetings, including at least one attended by the Accountable Executive, that gives senior managers visibility of the SMS activity, in particular:
    - Safety reporting and performance (KPI and SPI);
    - The effectiveness of the Hazard and Effects Management Process (HEMP);
    - Issues arising from the aircraft operator's Quality Assurance (QA) process; and,
    - Output from the department level, or similar meetings.
6. Disseminate safety information via newsletters, safety bulletins, etc., including information reviewed by management.
7. Implement policies on the use/abuse of alcohol, medical drugs and narcotics and "with cause" testing, aligned with Shell Life Saving rules and contract requirements, and;
    - Define an acceptable level of alcohol consumption for staff in safety-critical roles, including an alcohol-free period before duty; and,
    - Provides guidance on which over-the-counter and prescribed medication can impair an individual's ability to perform in the cockpit or workplace.

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## GUIDANCE

1. In addition to, or in lieu of National Aviation Authority (NAA) requirements, the Safety Commitment and Policy should also:
    - Reflect the organisational commitment to safety;
    - Include a clear statement on the commitment to provide the necessary resources for the implementation of the safety policy;
    - State that safety is a primary responsibility for all personnel and ensure that the policy is implemented and understood at all levels in the organisation; and,
    - Personnel need to have confidence in the Just Culture and the reporting system. They must know that confidentiality will be maintained and that the information they submit will be acted upon, otherwise they could decide that there is no benefit in their reporting. Just Culture process such as Baines Simmons FAiR®3 System and tools – See **SAF 02.01** Incident Reporting, Investigation and Learning.
2. No further guidance.
3. The range of safety promotion and communication processes to enable an effective flow of information process should;
    - Explain why particular safety actions are taken;
    - Explain why safety procedures are introduced or changed;
    - Seek feedback on safety issues or actions;
    - Safety Commitment and Policy Documents should be readily available to staff, e.g. By posting them at appropriate locations; and,
    - See also **SAF 02.01** Incident Reporting, Investigation and Learning.
4. These meetings could be appropriate safety committees, however for clarity ICAO definitions of these meetings are used below, and departmental meetings, cover, as appropriate;

    - Resolution and mitigation of identified risks;
    - Assessment of the safety impact of operational changes - Management of Change Process (**SAF 03.02**);
    - Review of Hazard Risk Management (**SAF 02.00**) processes and associated Remedial Action Plan;
    - Results and follow-up actions from audits, previous lower level safety meetings, and preventive actions and corrective action plans;
    - Corrective actions, including Assurance processes, being achieved within agreed timescales;
    - The effectiveness of safety recommendations and safety promotion;
    - Results of safety reporting and data analysis - Performance Monitoring (**SAF 03.01**);
    - Allocation of resources.

    Departmental meetings may be established as a Safety Action Group (SAG);The SAG can be a standing group or an ad-hoc group to assist or act on behalf of the SRB:

    - The SAG should report to, and takes strategic direction, from the SRB. It can be comprised of managers, supervisors and personnel from operational areas'
    - Membership of the SAG and frequency of meetings should be defined
    - The Safety Manager may also participate in the SAG, and,
    - In very large organisations more than one SAG may be established to focus on specific areas.

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5. The Accountable Executive Meeting may be established as the Safety Review Board (SRB) and in small organisations, the SAG and SRB may be combined. The review meeting should contain a process for assessing the suitability of safety communication and its effect on the organisation, and the Management Review Process, should be integrated such that it clearly links to: Emergency Response Management; Safety Risk Management process; Incident Reporting, Investigation and Learning; Performance Monitoring; Management of Change; and Safety Promotion.
6. Safety critical information can also be disseminated and conveyed, by;
    - Presentations;
    - Safety Notices;
    - Websites and e-mails; and,
    - Informal workplace meetings between staff and the accountable executive or senior managers.
7. In lieu of, or in addition to, any National Legislation the policy should include:
    - Consider a pre-hire, and random testing policy which is compliant with national legislation;
    - A "with cause" testing Policy for the presence of alcohol and drugs means there are good reasons to suspect impaired performance as a result of alcohol or drug abuse;
    - Aviation functions can be defined as acting as a pilot during a flight, acting as navigator of an aircraft or as a sensor operator during a flight, as well as acting as a member of the cabin crew; and,
    - Examples of when to implement the “with cause” testing policy due to suspected impaired performance include physical appearance, behaviour, other job-related circumstances (e.g., absence, problems, erratic job performance), reliable information of drug use or alcohol abuse or possession even where knowledge cannot be proven, give good faith reasons to question whether the employee may be in violation of the policy.

## REFERENCES

- EASA: **https://www.easa.europa.eu/system/files/dfu/Annex%20to%20ED%20Decision%202012-007-R.pdf**
- FAA Order 8000.3698;
- CASA Part 119.190.

## RELATED INCIDENT

America West Airlines Flight 556 was a regularly scheduled flight from Miami, Florida, to Phoenix, Arizona, operated by America West Airlines. On July 1, 2002, the plane was ordered back to the terminal after the pilots were suspected of being drunk beyond the legal limit. The pilots were ultimately convicted of operating an aircraft while intoxicated.

In the span of less than a week recently, authorities arrested three pilots from two airlines under suspicion of intoxication before they were about to fly. Following the arrests, United Airlines said it was changing its policy on when pilots could drink before a flight, extending the prohibition from eight hours to 12 hours — more than federal regulations require." (Washington Post, "What happens when an airline pilot is arrested for drinking on the job?" Hannah Sampson, August 13, 2019) **https://www.washingtonpost.com/travel/2019/08/12/what-happens-when-an-airline-pilot-is-arrested-drinking-job/**

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

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## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-1 SMS, 4. Key Safety Personnel, 13. Safety Communication, Section 690-2, 4. Drug and Alcohol Policy.

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## SAF 01.01 Management Commitment and Leadership

### MANDATORY REQUIREMENTS

**Leaders[1] within the Aircraft Operator are Accountable for Requirements 1-5:**

1. Are accountable for the effective management of the safety risks in their business:
    - Know and evaluate the safety risks associated with their position, responsibilities in the company and how they are managed;
    - Take corrective action if they are not satisfied that the controls for a risk are effective; and,
    - Communicate the operator's Safety Policies to their personnel and relevant sub-contractors.
2. Demonstrate leadership through measurable actions:
    - Plan and make base visits to engage with their personnel and relevant sub-contractors about safety;
    - Lead, or actively participate in safety activities: team meetings and safety programmes and campaigns; and,
    - Lead by example, act as a role model for safety compliance, intervene during day-to-day activities whenever they feel that safety requirements are not being met, including challenging business decisions.
3. Motivate, coach and develop personnel to manage safety risks effectively:
    - Act as a role model for safety compliance and report safety issues and near misses and encourage their personnel to do the same;
    - Develop their own competence and that of their team in line with company requirements;
    - Provide constructive feedback to their personnel on their safety behaviours and performance and celebrate success; and,
    - Include safety behaviours and performance in decisions about performance rewards, recruitment, personnel development and promotions.
4. Hold individuals accountable for their safety performance and behaviours, by:
    - Monitoring and reinforcing compliance with the company's procedures, applicable laws and regulations and take appropriate action to correct deficiencies; and,
    - Developing a Just Culture where people are encouraged to provide essential safety-related information, in which they are also clear about where the line must be drawn between acceptable and unacceptable behaviour, are not blamed for honest errors and mistakes, but are held accountable for willful violations and gross negligence.
5. Engage, where appropriate, with Joint Venture partners, sub-contractor management, local communities and authorities and industry associations on safety.

[1]The term "leaders" includes all management and supervisory positions in the organisation, including the chief executive and senior management team, middle management regional and base managers.

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## GUIDANCE

1. No further guidance.
2. A key element of leadership commitment is visible leadership, commonly demonstrated by workplace and site visits. These should allow leaders to:
    - Get to know people working at the workplace and demonstrate care;
    - Talk about work activities that matter to people;
    - Have a focus and purpose when engaging people; and,
    - Focus on the behaviour of people during work site visits and recognise the right behaviours.
3. Engaging in conversations with personnel and asking authentic questions lets the workforce see the genuine interest and commitment of their leaders and allows the leaders to gain a better insight into their HSSE exposure. Examples could be:
    - Can you describe to me what you do day today?
    - What are the greatest HSSE hazards you face?
    - How could you or someone else be hurt?
    - Do you feel you can stop an activity because of a safety concern?
    - When was an activity last stopped, or paused over a safety concern?
    - Do you feel cared for? Do you feel you are treated fairly?
    - Do you know what security risks you face, and do you understand what you should do in the event of a security incident, including where you should report an incident or suspicious behaviour?
    - Are there any HSSE issues here that we are not dealing with adequately?
    - When are you able to perform at your best?
    - What sometimes stops you performing at your best?
    - What would have to be different for you to feel more confident that an incident at this site is unlikely?
    - Do people feel they need to take shortcuts?
4. Leaders should strive to ensure that they receive regular feedback, and this means fostering an environment where feedback is actively sought on HSSE performance through open and honest conversations. It should be easier for people to provide feedback on a leader's HSSE behaviour if their leader has already established a feedback culture.
   Just Culture tools such as Baines Simmons FAIR Tool are used
5. Industry Associations, such a HeliOffshore, Helicopter Safety Advisory Committee (HSAC), OGUK Aviation Technical Steering Group (ASTG), European Business Aviation Association (EBAA), National Business Aviation Association (NBAA), International Airborne Geophysics Safety Association (IAGSA) etc.

## REFERENCES

- ICAO Annex 19 Appendix 2;
- UK CAA CAP 795 - Safety Management Systems (SMS) guidance for organisations;
- FAA Order 8000.3698;
- CASA Part 119.190;
- OGP Report 452 - Shaping safety culture through safety leadership;
- IOGP Report 453 - Safety Leadership in Practice: A Guide for Managers;
- IOGP Report 597 - Fabrication site construction safety recommended practice – Enabling activities

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## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-1, 2. Management Commitment and Leadership.

Terms in green are included in the **SGRAO Glossary**.
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## SAF 01.02 Safety Accountabilities and Responsibilities

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-5:**

1. Appoint key personnel and with defined accountabilities.
2. Identify the Accountable Executive who, irrespective of other functions, has ultimate responsibility and accountability for the implementation, finance, and maintenance of the Safety Management System (SMS).
3. Ensure the Accountable Executive has authority to ensure all activities can be financed and carried out to the required standard, and has final accountability for all safety issues.
4. Appoint a Safety Manager, who:
    - Has defined competence requirements, sufficient resources and safety structures to manage the implementation and maintenance of the SMS;
    - Acts as the focal point and is responsible for the development, administration, maintenance and promotion of the SMS; and,
    - Has direct access to the Accountable Executive.
5. Document clear lines of safety accountability and throughout the company, including a direct accountability for safety for all leaders, regardless of other duties, as well as of other staff.

### GUIDANCE

1. No further guidance.
2. No further guidance.
3. The Accountable Executive should have full authority to ensure adequate staffing levels to provide the organisation with the capacity and capability to deliver all activities in line with the Policy, Objectives and Management Review — Safety Communication (**SAF 01.00**) and final accountability for all safety issues.
4. The Safety Manager should be a full-time employee although in a small complex or non-complex organisation it may be a part-time role shared with other duties. They may also be the Compliance Monitoring / Quality Manager, but in such cases, there should be independent compliance monitoring of the SMS. The Safety Manager should be given appropriate status in the organisation to provide the necessary degree of authority when dealing with safety matters.
5. Leaders should establish and maintain governance over the implementation of the SMS, by, where possible, defining the levels of management with authority to make decisions regarding safety risk tolerability, and they should ensure that the relevant department senior leader is involved with line leadership in decisions affecting safety management and performance.

Terms in green are included in the **SGRAO Glossary**.
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## REFERENCES

- ICAO Annex 19 Appendix 2.
- IOGP Report 510 — Operating Management System Framework.
- UK CAA CAP 795 — Safety Management Systems (SMS).
- FAA Order 8000.3698.
- CASA Part 119.190.
- CASA Training Guidelines: **https://www.casa.gov.au/education/standard-page/sms-resource-kit**

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-1, 3. Safety Accountabilities and Responsibilities.

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## SAF 01.03 Key Safety Personnel Competence Training and Education

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-6:**

1. Document and define competencies requirements for safety-critical tasks and all operational staff, supervisors and management are in place, as are sufficient resources to manage and operate effectively within the Safety Management System (SMS).
2. Ensure operational staff understand the company's safety policy and the principles and processes of the organisation's SMS;
3. Ensure managers and supervisors understand the safety process, hazard identification, risk management and the management of change.
4. Ensure the Accountable Executive has an awareness of SMS roles and responsibilities, safety policy, safety culture, SMS standards, and safety assurance.
5. Document a requirement for staff to have initial induction and recurrent training to ensure continued competence appropriate to the level of involvement in the SMS; and,
6. Track training and competence in an appropriate system.

### GUIDANCE

1. Safety critical tasks, and the persons responsible for the tasks, should be identified and recorded by the operator according to the size of company, in the SMS Manual, or relevant department manuals.
2. No further guidance.
3. No further guidance.
4. No further guidance.
5. Training should cover duties within the SMS, and takes into account everyone's level of involvement in the SMS.
6. Training records should record the assessment and relevant training, including the result "competent" or "not yet competent";
    - The competence requirements for any staff responsible for safety critical tasks affected by process changes, procedural changes or organisational changes should be updated by the operator;
    - When there are changes to incumbents in positions responsible for safety critical tasks, competence requirements should be updated; and,
    - Competence gaps should be managed through an agreed and documented plan.

### REFERENCES

Terms in green are included in the **SGRAO Glossary**.
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## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-1 SMS 4. Key Safety Personnel, 12. Training and Education.

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## SAF 01.04 Emergency Response Planning and Management

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-7:**

1. Establish and maintain country, coordinated regional or global Emergency Response Plans (ERP) to meet the company needs and response objectives covering Credible Emergency Scenarios.
2. Establish an Emergency Response Organisation, which is staffed with emergency responders equipped and trained to a competence level to match their roles and responsibilities as outlined in the ERP.
3. Integrate, contacts and contact requirements for local Shell Business Unit responsible managers.
4. Conduct ERP process reviews and exercises, with aviation related objectives, prior to commencement of contracted operations, and then on a scheduled basis, at a minimum annually, for ongoing operations.
5. Test by exercises the integrity of the ERP by including Credible Emergency Scenarios at each operational base.
6. Carry out, post exercise review processes to record exercise learnings, track them to closure and all the exercises carried out are listed.
7. Validate and test bridging communications between the company, the aircraft operator and all SAR resources.

### GUIDANCE

1. This element is to be integrated, as it should support the effectiveness of the Hazard and Effect Management Process (HEMP) as described in **SAF 02.00**; and, the ERP should contain:
    - Activation triggers to initiate an emergency response;
    - Details of roles and responsibilities, including co-coordinators, Duty Managers etc.; and,
    - List of Emergency Contacts; and,
    - Credible Emergency Scenarios are defined as: A generalised detailed description of a hypothetical but credible incident. This is the result of an imagined sequence of events that could plausibly lead to an Incident requiring mitigation by emergency response. Most of these events may have occurred at the site in the last 3 years.
2. The Emergency Response Organisation should be able to demonstrate the required personnel levels to response to any Credible Emergency Scenarios.
3. No further guidance.
4. No further guidance.

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5. Credible Emergency Scenarios such as one of the following:
    - Accident on arrival or departure;
    - Overdue Aircraft;
    - Aeroplane - accident away from base;
    - Aircraft accident or ditching enroute;
    - Helicopter - accident on a remote helideck;
    - Helicopter ditching in rescue range of a facility or vessel; and,
    - Additional scenarios could be developed to fill out the remainder of the year's exercise schedule based on other Credible Emergency Scenarios, determined by the Risk Assessment in the HEMP; and,
    - As part of the annual exercise set out in Shell personnel should be included as observers, and include, where possible, an element of coordination with the Shell Business Unit emergency response organisation.
6. No further guidance.
7. Typical organisations that would be covered by interfaces are; SAR resources, airport operators, offshore locations etc.

## REFERENCES

- UK CAA CAP 795 SMS Guidance for organisations — February 2015.
- EASA AMC1 ORO.GEN.200.
- ICAO Annex 19 Appendix 2.
- ICAO Doc 9481 Emergency Response Guidance.

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-1 SMS, 5. Emergency Response Planning.

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## SAF 01.05 SMS Documentation

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirement 1:**

1. Document, detailed procedures covering all SMS activities and processes, as well as procedures for safety critical activities related to aircraft operations, including flight operations, aircraft maintenance and ground operations.

### GUIDANCE

1. The documented procedures should be appropriate to the size, nature, and complexity of the company.
    - SMS documentation should typically consider:
        - SMS manual or documents which includes all elements of the SMS;
        - SMS records, for example hazard logs, risk assessments, safety cases, meeting minutes; and
        - SMS processes are included in the company records and document management process;
    - Safety critical activities related to aircraft operations can be listed in the SMS manual or listed in other manuals or expositions;
    - Typical contents for an SMS manual should consider:
        - Scope of the SMS;
        - Safety policy and objectives;
        - Safety accountabilities;
        - Key safety personnel;
        - Documentation control procedures;
        - Hazard identification reporting and risk management schemes;
        - Safety performance monitoring;
        - Incident investigation and reporting;
        - Emergency response planning;
        - Management of change processes;
        - Safety promotion;
        - Contracted activities; and,
        - Just Culture policy and supporting processes.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## REFERENCES

- EASA AMC1 ORO.GEN.200(a)(3) Management system;
- ICAO Annex 19 Appendix 2;
- ICAO Doc 9859;
- UK CAA CAP 795 - Safety Management Systems (SMS) guidance for organisations;
- FAA Order 8000.3698;
- CASA Part 119.190.

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-1 SMS, 6. SMS Documentation.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## SAF 02.00 Safety Risk Management

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-8:**

1. Establish and maintain an effective Hazard and Effects Management Process (**HEMP**) or Hazard Risk Management (HRM) process.
2. Identify generic, mission specific, and location specific hazards for Worst-Case Credible Scenarios, with a consideration of human performance, safety culture, threat and error management.
3. Assess the risks associated with the identified Hazards using the company's Risk Assessment Matrix (RAM) or similar, including their effects on People, Assets, Community, Environment (PACE), and document the assessment of all Risks in a Hazards and Effects Register.
4. Provide a Documented Demonstration of ALARP, in a suitable format or software system, using an appropriate methodology (e.g. Bow-Tie etc.), as follows:
    - For hazards assessed as **Low** risk, manage for continuous improvement through effective implementation of the Safety Management System (SMS);
    - For hazards assessed as **Medium** risk, eliminate or substitute the hazards where Reasonably Practicable, or identify and implement controls and recovery measures to manage the risks to ALARP;
    - For hazards assessed as **High** risk, apply a Bow-Tie or equivalent analysis method that includes the following:
        - Identification of controls, escalation factors and recovery measures to prevent the release of a hazard and to reduce the consequences if the hazard is released;
        - Links the controls and recovery measures to the hazards;
        - Provides a document reference for the controls and recovery measures; and,
        - Assigns a responsible department or job title to each control, with controls identified for location specific hazards, assigned to local responsibility.
5. Maintain Remedial Action Plan (RAP) to close identified gaps.
6. Document a monitoring and verification process or method, which is tied to the company assurance process that validates the effectiveness of the controls and recovery measures.
7. Demonstrably link the HEMP/HRM to the safety reporting and investigation process such that any controls or barriers are assessed, monitored and verified for effectiveness.
8. Establish and maintain an effective HEMP/HRM review process, which includes a review of external accidents and incidents that are relevant to the operation and is linked to the company's Management of Change (MOC) process.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## GUIDANCE

1. The HEMP/HRM process should be appropriate to the size and complexity of the organisation.
2. Risks should be identified using internal resources such as staff reviews, external resources such as accident and incident reports, environmental influences, geography etc.:
    - A Worst-Case Credible Scenario is defined as “An Event that could realistically occur and that has the worst outcome from release of a Hazard if Controls fail”.
3. The Risk Assessment process should be used to compare the severity and likelihood of a hazard being released and information, instruction, training and supervision should be provided so that people are competent to apply the RAM;
    - A Hazards And Effects Register is defined as “A list of the Hazards that are associated with an activity, together with their potential Effects and assessed Risks”.
4. The Documented Demonstration should be linked to the Hazards and Effects Register, and Remedial Action Plan (RAP) when demonstrating ALARP and should the show the risk assessment rating assigned to each identified hazard;
    - A Documented Demonstration of ALARP, is defined as “A body of evidence that barriers are established and maintained that reduce risks to As Low As Reasonably Practicable (ALARP);
    - ALARP is defined as “The point at which the cost (in time, money and effort) of further Risk reduction is grossly disproportionate to the Risk reduction achieved”; and,
    - Reasonably Practicable is defined as “In the context of Managing Risk achievable without a gross disproportion between the cost (in time, money and effort) and the benefit”.
5. The RAP should be tied to the Documented Demonstration of ALARP process in 4:
    - A RAP is defined as “A plan to implement corrective action items”.
6. See **SAF 03.00** Continuous Improvement - Assurance.
7. See **SAF 02.01** Incident Reporting, Investigation and Learning.
8. See **SAF 03.02** Management of Change Process, and the HEMP review process should also be linked to the operator's, Management Review (**SAF 01.00**).

## REFERENCES

- ICAO Annex 19 Appendix 2.
- IOGP Report 510 — Operating Management System Framework.
- UK CAA CAP 795 — Safety Management Systems (SMS) guidance for organisations.
- FAA Order 8000.3698.
- CASA Part 119.190.

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-1 SMS, 7. Safety Risk Assessment and Hazard Identification.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## SAF 02.01 Incident Reporting, Investigation and Learning

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-8:**

1. Establish safety reporting procedures covering all regulatory and non-regulatory reports, including the reporting of lower level incidents or occurrences, hazards and near-miss events.
2. Encourage personnel at all levels to proactively report any incident, occurrence, hazard, error, or near-miss event they become aware of, as soon as possible. This is supported this by a Just Culture and protection is provided to the reporter, such as the option to make anonymous reports.
3. Report incidents to the designated Shell representative as detailed in the contract and allow access for investigations when agreed.
4. Assess all incidents using the company's risk assessment process.
5. Align the internal investigation process with ICAO Annex 13, Aircraft Accident and Incident Investigation, such that is uses trained investigators, review the effectiveness of the Hazard and Effects Management Process (HEMP) barriers, generates recommendations; and;
    - Includes occurrences that are not required to be reported to the National Aviation Authority (NAA), but, which are considered to provide valuable learning opportunities, such as high-potential, near-miss events;
    - Has an objective to understand why an event happened and the contributing causes, by taking full account of human and organisational factors using Human Factors methodology as part of the investigation process.
6. Track all recommendations from investigations to closure, any modified controls or barriers identified are put in place and include feedback process to the reporter and to the organisation.
7. Learn from significant and high potential incidents through the implementation of required actions from any safety investigations and address any identified hazards, and formally review these as part of the HEMP analysis process.
8. Enable the consistent application of Just Culture principles and apply process and tools for any event that may result in consequence management. Investigations are to ensure that sufficient information is gathered to determine the human factors and background causes, to enable the tools to be applied.

### GUIDANCE

1. No further guidance.
2. Though often of a minor nature, reports can be indicative of a potential hazard or trend that will only be recognised through systematic investigation and data analysis.
3. No further guidance.
4. The Risks associated with the incidents should be asssed by using the company's Risk Assessment Matrix (RAM) or similar, including the effects on People, Assets, Community, Environment (PACE).

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See the **Change Log** for version control information.

5. The scope of an internal safety investigations should be of a scale suitable to determine why an event occurred and validate or identify the underlying hazards; and,
    - Has a scope proportional to the identified hazard and risk;
    - Should takes place as soon as possible after the event;
    - Include, where appropriate:
        - Review of documentation and processes;
        - Operational data monitoring;
        - Interviews;
        - Root cause analysis; and,
        - Data analysis.
6. This element should be integrated such that it supports the effectiveness of the Safety Risk Management and Management Review processes as described in **SAF 02.00 - Safety Risk Management** .
7. Significant events should be shared with relevant industry safety bodies such as IOGP, and HeliOffshore.
8. Personnel need to have confidence in the Just Culture and the reporting system. They must know that confidentiality will be maintained and that the information they submit will be acted upon, otherwise they will decide that there is no benefit in their reporting. Just Culture process such as Baines Simmons FAiR®3 System and tools are used.

## REFERENCES

- ICAO Annex 19 Appendix 2.
- ICAO Annex 13 — Aircraft Accident and Incident Investigation - Standards and Recommended Practices for aircraft accident and incident Investigation.
- UK CAA CAP 795 — Safety Management Systems (SMS) guidance for organisations.
- FAA Order 8000.3698.
- CASA Part 119.190.
- EASA GM1 ORO.GEN.200(a)(3) Management system - INTERNAL OCCURRENCE REPORTING SCHEME.
- EASA AMC1 ORO.GEN.200(a)(3) Management system - COMPLEX OPERATORS - SAFETY RISK MANAGEMENT.

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-1 SMS, 8. Incident Reporting, Investigation and Learning.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## SAF 03.00 Continuous Improvement – Assurance

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-7:**

1. Implement and document a Quality Assurance (QA) system, in addition to, or in the absence of National Aviation Authority (NAA) requirements, covering flight operations, maintenance activities, ground operations, the Safety Management System (SMS) and Safety Risk Management.
2. Appoint a Quality Manager (or equivalent) to whom the management function has been assigned and who is in the sole control of QA system.
3. Detail a programme of risk-based audits using trained personnel, independent of the activities to be audited.
4. Implement an audit programme that covers internal processes, specialised activities, such as Flight Data Monitoring (FDM) and Health and Usage Monitoring Systems (HUMS), as well any externally contracted operations or activities and monitors compliance with all the aircraft operator's published manuals and activities.
5. Monitor the effectiveness of the risk barriers and controls detailed in the operator's published Hazard and Effects Management Process (HEMP).
6. Utilise a functioning records/data management system which tracks all audits, non-compliances and corrective actions to closure, is in place.
7. Track performance indicators which monitor the effectiveness of the QA system.

### GUIDANCE

1. The system may also be called Compliance Monitoring, and some companies also use Quality Control processes as part of the system. These should be described in applicable manuals, which cover departmental procedures, duties, responsibilities and reporting relationships; and should demonstrate that:
    - The document control process is effective;
    - The personnel acknowledgement process is effective; and
    - Continually seeks to improve its safety performance, using tools such as proactive evaluation of day-to-day operations, facilities, equipment, documentation and procedures through safety audits and surveys.
2. No further guidance.
3. No further guidance.
4. The programme of audits should monitor compliance with the operator's published manuals, such as:
    - The suite of Operations Manuals;
    - The Continuing Airworthiness Manual, or equivalent;
    - The Maintenance Organisation Exposition, or equivalent.
5. See **SAF 02.00** Safety Risk Management.
6. The records/data management system is appropriate to the size and complexity of the company; and
7. See also **SAF 03.01** Safety Performance Monitoring.

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See the **Change Log** for version control information.

## REFERENCES

- ISO 9001: 2015, Quality Management Systems.
- IOGP Report 510 — *Operating Management System Framework.*
- UK CAA CAP 795 — Safety Management Systems (SMS) guidance for organisations.
- FAA Order 8000.3698.
- CASA Part 119.19.
- CASA Safety Management System resource kit: Booklet 3 — Safety Risk Management.

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-1 SMS, 11. Continuous Improvement — Assurance.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## SAF 03.01 Safety Performance Monitoring

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirement 1:**

1. Monitor the safety performance of the organisation and establish Safety Performance Indicators (SPIs) which measure the safety performance of the organisation, and the effectiveness of the Safety Management System (SMS) for continuous improvement.

### GUIDANCE

1. Typically, safety objectives need to have been considered established before setting Safety Performance Indicators (SPI). This should allow the safety performance of the organisation to be measured against its safety policies and objectives, and the following should be considered in setting safety objectives:
    - It should be a statement of a desired outcome;
    - Safety objectives should be short, high-level statements of the safety priorities and should reflect the organisation's safety policy;
    - Safety objectives should address the organisation's most significant risks
    - Define what the organisation hopes to achieve; and
    - Confirm actual safety performance by reference to SPI and safety performance targets.

    SPI are developed and maintained appropriate to the size, nature, and complexity of the organisation and will typically, require the monitoring of data from various sources, such as:

    - Occurrences and events;
    - Safety reports;
    - Meeting attendance;
    - Safety reviews including trend analysis;
    - Audit closure rates;
    - Internal safety investigations; and,
    - Data quality controls should be in place to ensure that the data is accurate and complete.

    This SMS element should be integrated so that it supports the effectiveness of the Management Review as described in **SAF 01.00**.

### REFERENCES

- ICAO Annex 19 Appendix 2.
- IOGP Report 510 — Operating Management System Framework.
- UK CAA CAP 795 — Safety Management Systems (SMS) guidance for organisations.
- FAA Order 8000.3698.
- CASA Part 119.190.

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## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-1 SMS, 9. Safety Performance Monitoring.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## SAF 03.02 Management of Change

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-4:**

1. Implement an effective Management Of Change (MOC) process.
2. Manage the risk associated with significant changes related to aircraft operations including key personnel changes, through a documented Management of Change (MOC) process.
3. Identify changes that introduce new hazards, or impact the effectiveness of the existing barriers or controls in the Hazard Register and Hazard and Effect Management Process (HEMP) and included a process to track the effectiveness of the actions.
4. Select an individual to manage each MOC process and designate who is approved to sign off the change as completed.

### GUIDANCE

1. No further guidance.
2. A documented MOC process is initiated, when appropriate, typically, for the following:
   - Significant personnel and organisational changes;
   - Introduction of a new base;
   - Introduction of a new aircraft type; and,
   - Any other change that is deemed appropriate by the company through the use of the Risk Assessment and the Risk Assessment Matrix.
3. No further guidance.
4. No further guidance.

### REFERENCES

- ICAO Annex 19 Appendix 2.
- UK CAA CAP 795 — Safety Management Systems (SMS) guidance for organisations;
- FAA Order 8000.3698.
- CASA Part 119.190.
- CASA - **https://www.casa.gov.au/education/standard-page/sms-resource-kit**

### RELATED INCIDENT

### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-1 SMS, 10. Management of Change.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## SAF 04.00 Environmental Management

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-3:**

1. Develop controls for environmental management to prevent damage to the environment and people from pollution, waste, noise, etc.
2. Capture hazards associated with the environment in the Hazard and Effect Management Process (HEMP) and assure the associated controls are in place.
3. Follow local and/or national regulatory requirements for environmental management.

### GUIDANCE

1. Environmental Management System (EMS)" should align with ISO 14001.
2. No further guidance.
3. No further guidance.

### REFERENCES

- ISO 14001 Environmental Management System.

### RELATED INCIDENT

### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

### IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-1 SMS, 15. Environmental Management.

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See the **Change Log** for version control information.

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| | Shell specific text |
| | 690 text reads as guidance |

# TABLE OF CONTENTS

## FOR.1 FLIGHT OPERATIONS – ORGANISATION

### FOR 01.01 Air Operator Certificate

#### MANDATORY REQUIREMENTS

The Aircraft Operator is Accountable for Requirements 1-5:

1. Hold and maintain a valid Air Operator Certificate (AOC) or equivalent, issued by the relevant National Aviation Authority (NAA), that covers the aircraft type(s), all aspects of the type of operation and the geographic area relevant to the contract.
2. Include in the AOC up to date Operations Specifications or equivalent approvals .
3. Maintain a suite of controlled Operations Manuals with the necessary content, approved (or when applicable, accepted) by the NAA. The Operations Manual covers normal and emergency operations and is suitable for the operational circumstances and the aircraft types operated.
4. Demonstrate to the responsible NAA that its management team, organisational structure, method of control and supervision of flight operations, training programmes, ground handling, airworthiness and production arrangements meet the minimum standards defined by local regulations.
5. Verify the control of these documents via a programme of assurance audits.

#### GUIDANCE

1. A copy of the AOC and the AOC Operations Specifications should be made available on request.
2. All contracted operations should be conducted in accordance with the AOC Operations Specifications.
3. The hierarchy of manuals may be issued in separate parts corresponding to specific aspects of an operation. It should include the instructions and information necessary to enable the personnel concerned to perform their duties and all controlled documents should be read and understood by new employees and by all employees when amended. Employees should sign as having read and understood the documents both on joining and when amended.
4. In those countries where an AOC and/or AOC Operations Specifications are not normally issued under national regulations for certain activities (e.g. utility and aerial work operations), alternative arrangements may be agreed in consultation with Shell Technical Authority (TA1).
5. For details of audits, see **SAF 03.00** Continuous Improvement — Assurance.

#### REFERENCES

- ICAO Annex 6 — Operation of Aircraft — International Operations — Helicopters.

#### RELATED INCIDENT

Terms in green are included in the **SGRAO Glossary**.
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## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-2, 1. Air Operator Certificate.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 01.02 Organisation and Management of Personnel

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-4:**

1. Appoint the following management and operational positions:
    - The Accountable Manager for the Air Operators Certificate;
    - A person with overall responsibility for managing the flight department;
    - A person responsible for managing flight training;
    - A person responsible for safety and quality assurance;
    - A person or third party responsible for managing continuing airworthiness requirements and aircraft maintenance;
    - A person responsible for managing ground operations (appropriate to the size of the operator); and,
    - Where the organisation has more than one operating base, the management structure addresses the required responsibilities at all locations.
2. Define and document the duties and responsibilities of personnel in management and operational positions.
3. Define and document procedures for the assessment and assurance of competence for the above management and operational positions.
4. Track competence in a suitable system.

### GUIDANCE

1. One person may perform more than one role in small organisations.
2. Duties and responsibilities should be documented in the appropriate manual.
3. No further guidance
4. No further guidance.

### REFERENCES

- ICAO Annex 6, Operation of Aircraft - International Operations – Helicopters.
- UK CAA, CAP 795 Safety Management Systems - Guidance to Organisations.
- UK CAA, CAP 1059 Safety Management Systems: Guidance for small, non-complex organisations.

### RELATED INCIDENT

### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

Terms in green are included in the **SGRAO Glossary**.
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## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-2, 2. Management of personnel.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 01.03 Flight Crew Responsibilities

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-5:**

1. Appropriately crew aircraft for the task and environment.
2. Document procedures outlining the duties and responsibilities of all flight crew members, specifically 'Pilot Flying' and 'Pilot Monitoring' roles and tasks.
3. Designate a Pilot-in-Command (PIC) for each flight.
4. Document and assign specific responsibilities to cabin crew and others involved in the conduct of the flight.
5. Establish, document and maintain Standard Operating Procedures (SOPs) that enable crew members to operate the aircraft effectively and within the limitations specified in the aircraft flight manual.

### GUIDANCE

1. Normal crewing is two pilots, any differences in crew number, such as single pilot operations are agreed by the Shell Technical Authority — Air Transport (TA1).
2. Specific Pilot-in-Command and flight crew responsibilities should include:
    - The safe conduct of assigned flights;
    - Assessment of weather and all applicable NOTAMs where available;
    - Determining fuel, oil and oxygen requirements;
    - Determining aircraft weight and balance;
    - Confirming all flight-planning requirements have been met;
    - Confirming the aircraft is certified as airworthy with a release to service, correctly registered and that the required documentation is on-board the aircraft;
    - Conducting an aircraft pre-flight inspection as per company, manufacturer and regulatory requirements, before each departure;
    - Confirming that the crew and passengers have had an appropriate safety briefing;
    - Operating the aircraft in accordance with operator Standard Operating Procedures (SOP) and aircraft limitations;
    - Completing all post flight duties as specified in the Company manuals; and,
    - Recording flight times and aircraft defects in the aircraft technical log.
3. No further guidance.
4. For cabin crew and other crew members on board the aircraft, they should have specific, assigned safety duties in the event of an on-board emergency. This includes medical staff or escorts in medical evacuation flights.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

5. The SOP should include clear instructions for the Pilot Flying (PF) and the Pilot Monitoring (PM). SOPs are universally recognised as basic to safe aviation operations. Effective crew coordination and crew performance, two central concepts of crew resource management (CRM), depend upon the crew's having a shared mental model of each task. That mental model, in turn, is founded on SOPs. SOPs should be clear, comprehensive, readily available in the manuals used by flight crew members, and be based on aircraft manufacturers Flight Crew Operations Manuals (FCOM) where available for the aircraft type.

## REFERENCES

- ICAO Annex 6 — Part 2, Operation of Aircraft — International Operations — Helicopters

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, 690-2, 16. Composition of flight crew.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 01.04 Flight Crew Scheduling

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirement 1:**

1. Establish and document a flight crew scheduling process, which demonstrates that flight crew comply with the following:
    - Flight crew qualification and experience requirements;
    - Crew composition requirements; and
    - Compliance with documented flight and duty time limitations.

### GUIDANCE

1. The prime objective of a flight time limitations scheme should be to ensure that crew members are properly rested at the beginning of each flying duty period, and whilst flying, are sufficiently free from fatigue so that they can operate to a satisfactory level of efficiency and safety in all normal and abnormal situations.

   Aircraft Operators should appreciate the relationship between the frequency and pattern of scheduled flying duty periods, rest periods and time off, and give due consideration to the cumulative effects of working long hours interspersed with minimum rest.

   The operator should prepare duty rosters sufficiently in advance to provide the opportunity for crew to plan adequate pre-duty rest.

### REFERENCES

### RELATED INCIDENT

### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

### IOGP REPORT REFERENCE

- Not clearly listed in 690.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 01.05 Subcontracted Pilots

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Aaccountable for Requirements 1 to 7:**

1. Prohibit the employment of freelance pilots and only use subcontracted pilots subject to certain conditions.
2. Ensure subcontracted pilots meet all required flight crew qualification and experience requirements.
3. Subcontracted pilots are fully included in the operator's training programme, including simulator training, and have received the operator's formal company indoctrination/induction and line training.
4. Require subcontracted pilots to inform the aircraft operator of all their flight and duty times, and the operator use the information in a controlled process to demonstrate compliance with flight and duty times.
5. Carry out licence Proficiency Checks (LPC) or Operational Proficiency Checks (OPC) (or equivalent) and conversion training is in accordance with operator and local National Aviation Authority (NAA) regulations.
6. Apply the contract, and operator's, absence and recency requirements to any subcontracted pilots.
7. Training records for subcontracted pilots demonstrate that qualifications, experience and training requirements have been met.

### GUIDANCE

1. Freelance Pilots are hired to work for different operators on particular assignments, and their training is typically controlled outside the operators training programme; and there is typically no cross-checking of Flight and Duty times between the operators or the individual.
2. Subcontracted pilots should only be used when:
    - Flight crew qualifications, **FOR 04.01**, experience level and recent experience requirements, **FOR 04.02** (FW) or **FOR 04.03** (RW) and medical requirements, **FOR 06.01**, have been met;
    - The pilot has received the flight training programme described in **FOR 05.01**, **FOR 05.02** and **FOR 05.03**.
3. No further guidance.
4. The pilot and aircraft operator should be able to demonstrate that details of the Flight Duty Periods (FDP) in **FOR 06.02** and **FOR 06.03** (FW), or **FOR 06.04** and **FOR 06.05** (RW) and **FOR 04.04**, Pilots Flying More Than One Aircraft Type, for all contracted and non-contracted flying are tracked.
5. No further guidance.
6. No further guidance.
7. No further guidance.

### REFERENCES

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-2, 14. Use of subcontracted pilots.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 01.06 Single-Engine Aircraft

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-3:**

1. Prohibit the operation of single-engine aircraft over water beyond a distance that would exceed the gliding distance or autorotation distance to a safe forced landing area on land.
2. Prohibit the operation of single-engine aircraft at night or in Instrument Meteorological Conditions (IMC).
3. When single-engine, gas turbine powered aeroplanes are used a documented risk assessment is conducted. The following mitigating factors are in place:
    - Day operation in Visual Meteorological Conditions (VMC);
    - Enhanced pilot training to include actions in the event of loss of engine power;
    - Additional mandatory equipment including;
        - Weather radar;
        - Radio altimeter; and,
        - Terrain Avoidance Warning System (TAWS).
    - Declaration and inspection of suitable landing sites.

### GUIDANCE

1. Single piston-engine aeroplanes, or single-engine helicopters are normally not used, refer to the Shell Technical Authority — Air Transport (TA1).
2. Although this may be permitted by National Aviation Authority (NAA), this is not normally permitted for Shell Operations, except in specific circumstances, refer to the Shell Technical Authority — Air Transport (TA1).
3. Single Gas Turbine aeroplanes are used in preference to piston multi-engine aeroplanes and any variances to equipment is agreed with the Shell Technical Authority — Air Transport (TA1)

### REFERENCES

### RELATED INCIDENT

### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

1, 15.

### IOGP REPORT REFERENCE

- R590 does not permit the use of single engine aircraft as indicated, but does require life jackets to be worn, life rafts, and survival equipment to be carried onboard the aircraft when overwater.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 01.07 Automation Policy

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-6:**

1. Define and document automation procedures to ensure controlled flight can be sustained with, or without, the use of automation.
2. Procedures contain requirements for the appropriate use of automation to reduce cockpit workload and increase standardisation.
3. Procedures are defined for all phases of flight.
4. Procedures for the use of automation are type-specific and based on those published in the Flight Crew Operating Manual (FCOM), where available.
5. Define procedures for manual flight control to maintain flight proficiency including those conditions under which automation systems may be deselected and manual flight undertaken.
6. Define clear requirements in the Minimum Equipment List (MEL) for the Automatic Flight Control System (AFCS) to be serviceable for night or IFR flights.

### GUIDANCE

1. The procedures should describe the use of an appropriate level of automation for the task, including manual flying and the policy should include monitoring of the AFCS/Flight Management Systems (FMS) by:
    - Cross-checking the mode selection and the status,
    - Then observing the result of any change; and,
    - Supervising the resulting guidance and aircraft performance.
2. See **FOR 01.03** Flight Crew Responsibilities – Standard Operating Procedures.
3. No further guidance.
4. No further guidance.
5. No further guidance.
6. For MEL references see **ENG 02.04** Continuing Airworthiness — Minimum Equipment List.

### REFERENCES

- HeliOffshore Flightpath Management Recommended Practices (HO-FPM-RP-v2.0).

### RELATED INCIDENT

### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

- IOGP REPORT REFERENCE

IOGP 690 OHRP, 690-2, Section 5 Automation.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 01.08 Airborne Collision Avoidance Systems (ACAS)

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-3:**

1. As part of mitigating the risk of mid-air collisions, documenting procedures for the use of ACAS 1 and 2 (as applicable).
2. Include clear instructions for the response to ACAS alerts in Standard Operating Procedures.
3. Include the response to ACAS alerts in flight crew training including the differences between ACAS 1 and ACAS 2.

### GUIDANCE

1. Some Aircraft Flight Manuals (AFM) use Traffic Collision Avoidance System (TCAS) in place of ACAS, refer to **FOR 07.01** as ACAS II fitment may be exempt by risk assessment for low traffic areas.
2. The requirement to maintain an effective lookout whilst one crew member is engaged in tasks inside the cockpit should be included.
3. The difference between a Traffic Alert (TA) and a Resolution Advisory (RA), plus limitations in the AFM should be part of the training.

### REFERENCES

### RELATED INCIDENT

### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

### IOGP REPORT REFERENCE

- IOGP 690 OHRP, 690-2, 7. Airborne Collision Avoidance Systems.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 01.09 Terrain Awareness Warning Systems (TAWS)

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-4:**

1. Document and implement procedures for the use of TAWS and Helicopter Terrain Awareness Warning Systems (HTAWS) to mitigate Controlled Flight into Terrain (CFIT) accidents.
2. Include the response to TAWS/HTAWS alerts in flight crew Standard Operating Procedures (SOP) and training .
3. Install offshore modes, when available and certified for the helicopter type and region.
4. Implement documented procedures to require that the latest version of the database for predictive terrain hazard warnings is installed.

### GUIDANCE

1. No further guidance.
2. See **FOR 01.03** Flight Crew Responsibilities for SOP guidance.
3. Typically, an aircraft software and/or equipment upgrade are required to install HTAWS Offshore Modes.
4. The process should cover calendar and out of phase/unscheduled updates.

### REFERENCES

### RELATED INCIDENT

### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

### IOGP REPORT REFERENCE

- IOGP 690 OHRP, 690-2, 6.Terrain Awareness Warning Systems (TAWS)

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR.2 FLIGHT PREPARATION

### FOR 02.01 Flight Preparation - Pre Flight Planning

**MANDATORY REQUIREMENTS**

**The Aircraft Operator is Accountable for Requirements 1-4:**

1. Document flight planning procedures, which require the flight crew to complete flight preparation and pre-flight planning prior to the commencement of each flight and, as a minimum, to review the following before flight:
    - Review the configuration and serviceability of the aircraft, with reference to the Minimum Equipment List (MEL) or Configuration Deviation List (CDL) if there is a deferred defect in the Aircraft Technical Log (ATL);
    - Weather conditions;
    - Sea State (where applicable);
    - Routing, current maps and charts;
    - Destination and alternate airports;
    - NOTAMS;
    - Aircraft performance, manifest, weight and balance;
    - Fuel planning, requirements; and,
    - Preparation of an Operational Flight Plan (OFP).
2. Conduct flight operations (including Night Commercial Air Transport (CAT) passenger operations) under Instrument Flight Rules (IFR), when IFR flight is possible. For IFR Flights:
    - The available information indicates that conditions at the aerodrome of intended landing, or at least one destination alternate will, at the estimated time of arrival, be at or above the aerodrome operating minima;
    - For helicopter flights from offshore locations to an onshore destination, no alternate is required, provided, the following criteria are met:
        - The destination aerodrome has a published instrument approach;
        - The flight time is less than three hours; and
        - The published weather forecast valid from 1-hour prior, and 1-hour after the expected landing time specifies that the cloud base is at least 700 feet above the minima associated with the instrument approach, or 1000 feet above the destination aerodrome, whichever is the higher; and visibility is at least 2500 metres.
3. Permit flight operations under Visual Flight Rules (VFR) only when IFR flight is not possible, or when VFR is a safer option;
    - For VFR flights planning, weather indicates that meteorological conditions along the route, departure point, and arrival destination are above VFR weather minima as defined in FOR 02.04 Weather Minima.
    - All night VFR flights utilise IFR cockpit procedures for take-offs, en-route and landings.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## GUIDANCE

1. Flight preparation:
    - Preparation of an Operational Flight Plan – see [**FOR 02.05**];
    - Weather at departure, destination and alternate airports – see [**FOR 02.04**);
    - Aircraft performance, manifest, weight and balance – see [FOR **02.05**, **02.06**, **02.07**]:
    - Deferred defect in the aircraft technical log; – see **[FOR 02.08**]: and,
    - If the flight does not have an Operational Flight Plan. see [FOR **02.05**, **02.06**, **02.07**].
    - In addition consider:
        - Enroute contingencies and diversion planning.
        - Destination airport instrument approach availability.
        - Customs, Immigration, Entry and Health requirements where applicable.
        - Landing and overflight permits.
        - State AIP differences and regional/area procedures.
2. The use of coastal aerodrome criteria may be permitted subject to National Aviation Authority (NAA) approval and approval of the Shell Technical Authority (TA1). Flight planning and conduct should consider adequate altitude margins based on IFR Minimum Safe Altitudes, follow IFR takeoff, en-route, arrival and approach procedures where possible (visual arrivals, approaches and departures are considered as standard instrument procedures) and, typically, include standard IFR / offshore fuel reserves. Fuel to proceed to an alternate airport may be excluded, if weather conditions are such that an alternate airport is not required by regulations and when it can safely be excluded.
3. No further guidance.

## REFERENCES

- UK CAA CAP 437.
- ICS Guide to Helicopter-Ship Operations Chapters 3.7.3, 4.2.3
- Helideck Certification Agency - Helideck Limitations List Part C:
  **https://www.easa.europa.eu/document-library/general-publications/easy-access-rules-air-operations**

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

TBC

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-2, 26. Flight planning, 34. Pre-flight and post-flight procedures.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 02.02 Operating Minima

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-7:**

1. Provide the means to flight crew to determine whether airports and heliports of intended use are acceptable.
2. Provide the means to flight crew to determine operating minima for airports or heliports of intended use.
3. Provide information on when Runway Visual Range (RVR) is required, including when operating minima is below 800 meters visibility, unless RVR is provided for aircraft landing operations.
4. Specify the minimum RVR values for take-off and all authorised approaches taking into consideration inoperative approach/runway lighting, inoperative transmissometers, and/or inadequate visual reference.
5. Require all multi-engine aircraft to meet required departure and missed approach climb gradients with one engine inoperative based on planned weights and environmental conditions. This is to be verified during pre-flight planning.
6. Document and implement a process to ensure that One Engine Inoperative (OEI) departure and missed approach compliance is verified during pre-flight planning.
7. Require the Pilot-in-Command (PIC) to determine if any significant obstacles exist in the take-off and climb path prior to conducting a take-off; and if obstacles do exist, determine by use of the approved aircraft performance charts and related information, that the aircraft will safely clear such obstacles.

### GUIDANCE

1. Information provided to flight crew to determine whether airports and heliports of intended use are acceptable should include:
    - Applicable performance requirements and limitations including operational penalties resulting form degraded or unserviceable aircraft systems;
    - Runway or heliport characteristics;
    - Air Traffic Service and communications;
    - Navigation aids and lighting;
    - Weather reporting;
    - Sea state or pitch, roll heave of the vessel (if applicable); and,
    - Emergency services, including temporary periods of reduced Rescue and Fire Fighting Services (RFFS).
2. No further guidance.
3. No further guidance.
4. No further guidance
5. Where permitted by the National Aviation Authority (NAA), operators may inplement Contingency Procedures, subject to review and agreement by the Shell Technical Authority (TA1)
6. No further guidance
7. No further guidance.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## REFERENCES

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- R590 requires checking weather minima for destination and alternate airports as well as minimum departure obstacle clearance for multi-engine aircraft; R590 does not specifically reference any of the requirements.
- IOGP 690 does not clearly define these requirements.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 02.03 Offshore Alternates - Helicopters – Planning and Execution

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-11:**

1. Only use offshore installations as alternates in exceptional circumstances and when agreed by the in contract.
2. Document a policy and procedure in the operations manual for the use of offshore alternates, and that procedure has been approved or accepted by the National Aviation Authority (NAA).
3. When the use of an offshore alternate is approved:
    - Establish a Point of No Return (PNR):
    - Before the PNR, an onshore alternate is available; and,
    - Plan that the PNR is within 30 minutes planned flying time from the destination, calculated by using en-route weather reports;
4. Assure One Engine Inoperative (OEI) landing capability at the alternate by the following:
    - Restricting the use of offshore alternates to helicopters that can achieve One Engine Inoperative (OEI) In Ground Effect (IGE) hover at an appropriate power rating at the offshore alternate;
    - When the surface of the offshore alternate helideck, or prevailing conditions (especially wind velocity), precludes an OEI IGE hover, calculate the landing weight, using an OEI, Out of Ground Effect (OGE) hover performance at an appropriate power rating at the offshore alternate;
    - Calculate the landing weight from data provided in the aircraft flight manual. When calculating this landing weight, take account of the helicopter configuration, environmental conditions and the operation of systems that have an adverse effect on performance; and,
    - Plan that the landing weight of the helicopter, including 30 minutes of final reserve fuel, will not exceed the OEI landing mass at the time of approach to the offshore alternate.
5. Guarantee deck availability by;
    - Assessing the dimensions, configuration and obstacle clearance of individual helidecks or other sites in order to establish operational suitability for use as an alternate by each helicopter type used; and,
    - Require the duty holder of the nominated offshore alternate to guarantee the availability of the deck (no other planned helicopter operations, a clear deck, and no crane operations) before the flight is dispatched.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

6. Confirm that the weather forecasts for the offshore destination and offshore alternate are available, and that the forecast weather indicates that, at the Estimated Time of Arrival (ETA ) ±1 hour, the weather conditions will be at or above the planning minima shown in table 1 below:
    - *Table 1: Weather Minima*

| | Day | Night |
|---|---|---|
| Cloud Base | 600 Ft | 1000 Ft |
| Visibility | 4000 m | 5000. |

    - Prohibit the use of offshore alternates when fog is forecast, or has been observed within the last two hours within 60 NM of the destination or alternate;
7. Use only observations taken by a qualified observer, or Automated Weather Observing System (AWOS) acceptable to the NAA, to record the meteorological observations at the destination and alternate.
8. Reflect essential requirements for this type of operation in the helicopter MEL and ensure there are no open defects relating to MEL items required for the use of offshore alternates.
9. Use spare payload capacity to carry additional fuel, if it would facilitate the use of an onshore alternate.
10. Select only an installation as an offshore alternate which has an approved aircraft refuelling capability with all recent serviceability and fuel testing checks completed.
11. Complete the following actions before passing the PNR;
    - Confirm that navigation to the destination and offshore alternate is assured;
    - Establish radio contact with the destination and offshore alternate (or responsible radio operator);
    - Obtain and confirm that the landing forecast at the destination and offshore alternate is above the required minima as listed in Table 1;
    - Check that OEI landing requirements are attainable at both the destination and alternate; and,
    - Confirm that the availability of the offshore alternate has been guaranteed by the duty holder (rig operator for fixed installations and the owner for mobiles or vessels) until landing at the destination, or the offshore alternate, has been achieved (or until offshore shuttling has been completed).

## GUIDANCE

1. Prior to the commencement of flights requiring the use of offshore alternates, the Aircraft Operator obtains the agreement of the relevant Shell Technical Authority — Air Transport (TA1) and Shell Aircraft.
2. Procedures should include calculation and application of minimum approach speeds based on arrival weight and conditions.
3. If the offshore alternate is mobile, the operator should determine additional barriers to ensure position accuracy and appropriate deck movement limits to manage the risk that deck movement will not be out of limits.
4. To address the event of an engine failure beyond the PNR the Aircraft Operator should establish and document procedures for offshore OEI landings and include these procedures in initial and recurrent pilot training.

Terms in green are included in the **SGRAO Glossary**.
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5. To the extent possible, the availability of the offshore alternate should be guaranteed by the duty holder (the operator in the case of fixed installations and the owner in the case of mobiles) until landing at the destination, or the offshore alternate, has been achieved (or until offshore shuttling has been completed), and the use of offshore helidecks by multiple aircraft should be coordinated to ensure they are available when needed.
6. No further guidance.
7. No further guidance.
8. See **ENG 02.04** Continuing Airworthiness — Minimum Equipment List.
9. No further guidance.
10. See para 3.
11. No further guidance.

## REFERENCES

- ICAO Annex 6 Part III – International Operations – Helicopters
- EASA Part-CAT CAT.OP.MPA.181(d), AMC1 CAT.OP.MPA.181(d), Part-SPO AMC1 SPO.OP.151.

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-2, 28. Offshore alternates - Planning and 690-2, 29. Offshore Alternates - Execution.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 02.04 Weather Minima

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-6:**

1. Use weather minima for Instrument Flight Rules (IFR) departures and approaches specified in the National Aviation Aurthority (NAA) Aeronautical Information Publication (AIP) and comply with local regulatory IFR weather minima unless more stringent Company requirements are issued.
2. Document Visual Flight Rules (VFR) weather minima and do not allow flights to depart, or continue, if the weather conditions at departure, en-route, or at the destination are below the following VFR weather minima:

| Flight Regime | Minimum Operating Height(AGL/AMSL) | Cloud Base (feet) | Visibility[1] | Requirements for these VFR weather minima |
|---|---|---|---|---|
| **Offshore - Day** | 500 feet | 600 feet | 5000m | ICAO minima |
| **Offshore - Day** | 300 feet | 400 feet | 2000m**[2]** | Offshore inter-field use only if sector is less than 10nm |
| **Offshore - Night** | 500 feet | 600 feet | 5000m**[3]** | Offshore inter-field use only if sector is less than 10nm<br>All night flights shall utilise IFR cockpit procedures for take-offs and landings. |
| **Onshore - Day** | 500 feet | 600 feet | 5000m**[4]** | ICAO minima |
| **Onshore – Night** | 1000 feet | 1100 feet | 5000m**[5]** | Twin-engine IFR-certified helicopter with IFR night-current multi-crew.<br>All night flights shall utilise IFR cockpit procedures for take-offs and landings. |

[1]The operations manual requires that helicopters operating in VMC below MSA in visibilities of less than 5000m are to be flown at a groundspeed that will give adequate opportunity to observe other traffic or any obstacles in time to avoid collision.
[2]Subject to NAA approval, helicopters may be operated in flight visibility down to 800m provided the destination or an intermediate structure is continuously visible.
[3]Subject to NAA approval, helicopters may be operated in flight visibility down to 1500m provided the destination or an intermediate structure is continuously visible.
[4]Subject to NAA approval, helicopters may be permitted to operate in less than 1500m, but not less than 800m flight visibility in circumstances where the probability of encounters with other traffic would normally be low. Regulations may permit, depending on the flight altitude and class of airspace, that flights are operated in less than 5000m during day.
[5]Subject to NAA approval, helicopters may be permitted to operate in less than 1500m flight visibility in circumstances where the probability of encounters with other traffic would normally be low.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

3. Document a procedure to determine take-off minima from runways where none is specified.
4. Prohibit an aircraft from continuing its approach-to-land beyond a point at which the limits of the aerodrome operating minima would be infringed.
5. Maintain minimum safe altitudes during departure, en-route and arrival procedures.
6. Prohibit flights into known or expected icing conditions unless the aircraft is equipped and certified for flight in icing conditions.

## GUIDANCE

1. No further guidance.
2. See also **FOR 02.01** Flight Preparation - General.
3. No further guidance.
4. No further guidance.
5. No further guidance.
6. No further guidance.

## REFERENCES

- EASA – Easy Access Rules for Air Operations
- ICAO Annex 6 Part 3

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

1, 2, 6, 7, 13, 15, 16.

## IOGP REPORT REFERENCE

- R590 does not specifically cover requirements 2-6.
- IOGP OHRP 690-2 21; Aviation Weather – IFR/VFR

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 02.05 Flight Planning

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-5:**

1. Document and implement a fuel policy and provide instructions to flight crew for calculation of minimum departure fuel, which includes (as applicable), taxi, trip, approach, missed approach, alternate, contingency and reserve fuel.
2. Document requirements for the calculation of aircraft mass, centre of gravity limits, and acceptance by the pilot-in-command (PIC), and a procedure for Last Minute Changes (LMC) to the load sheet including tolerance for the maximum difference between planned and actual mass. The load sheet is approved or accepted by the National Aviation Authority (NAA).
3. Describe the Air Traffic Service (ATS) Flight Plan and its use in the relevant company manuals.
4. Describe the Operational Flight Plan (OFP) or equivalent document and its use in the relevant company manuals.

### GUIDANCE

1. Guidance should be provided in the OM to enable flight crews to establish suitable en-route alternates. For helicopters also refer to **FOR 02.03** – Offshore Alternates;
2. Aircraft Operators may prepare and use standard load plans where applicable and approved by the National Aviation Authority (NAA).
3. No further guidance.
4. The OFP should include the following:
    - Aircraft registration, type and variant;
    - Date of flight and flight identification;
    - Point of departure, STD, STA, destination;
    - Types of operation (Extended-range Twin-engine Operational Performance Standards (ETOPS), IFR, ferry flight, other)
    - Applicable Notices to Airmen (NOTAMs) pertinent to the flight;
    - Route and route segments with check points/waypoints, distances, time and tracks;
    - Planned cruise speed and flying times between waypoints/check points;
    - Planned altitude and flight levels;
    - Fuel plan including calculations and fuel on board when starting engines;
    - Alternate(s) for destination and, when applicable, take-off and en-route;
    - Take-off alternate airport when weather conditions at the airport of departure are at or below the applicable aerodrome landing minima, or it will not be possible to return to the airport of departure for other reasons; and
    - Relevant meteorological information.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## REFERENCES

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- R690 OHRP – 26 – Flight Planning – this requirement covers this section.
- R590 does not specifically cover requirements 4-5 of **FOR 02.05**.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 02.06 Fuel Requirements – Aeroplanes

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirement 1-4:**

1. Establish and document flight planning procedures, in addition to, or in lieu of National Aviation Authority (NAA) requirements, to ensure aeroplanes depart with sufficient fuel reserves to avoid fuel exhaustion for the planned operations and additional reserves to cover deviations from the planned operations.
2. For all flights:
    - Taxi fuel – The total amount of fuel expected to be used prior to take-off, including allowances for operation of ice protection systems and Auxiliary Power Unit (APU), and any foreseeable delays prior to take-off;
    - Trip Fuel – Include take-off, climb, cruise, descent, approach and landing, taking into account departure and arrival routings, meteorological conditions, foreseeable air traffic routings and traffic delays, landing at a suitable aerodrome in the event of loss of cabin pressurisation or, in the case of multi-engine aeroplanes, failure of any engine, at the most critical point during the flight; and,
    - Any other foreseeable conditions that could delay the landing of the aeroplane.
3. For IFR Flights:
    - Sufficient fuel for the proposed route;
    - Contingency Fuel – 5% of the planned trip fuel, but not less than 10 minutes at normal cruising speed, or, in the event of in-flight re-planning, 5% of the trip fuel for the remainder of the flight but not less than 10 minutes at normal cruising speed;
    - Alternate Fuel – Includes the missed approach procedure, climb, cruise , descent, approach and landing at the alternate considering departure and arrival routings;
    - Final Reserve Fuel – Sufficient to hold for 30 minutes, jet or turbo-jet propeller aeroplanes, or 45 minutes propeller aeroplanes powered by a piston engine, at 1500 ft. above airport elevation in ISA calculated with the estimated landing weights on arrival at the alternate; and
    - Extra Fuel at the discretion of the Pilot-in-Command (PIC).
4. For VFR Flights:Sufficient fuel for the proposed route;
    - Additional fuel required by the NAA, or 10% of the route fuel, whichever is higher; and
    - 30 minutes at the cruising speed consumption.

### GUIDANCE

1. Sufficient fuel is in addition to unusable fuel as listed in the Aircraft Flight Manual.
2. No further guidance.
3. The fuel computation for the leg to the alternate is calculated at the low-altitude cruise fuel consumption rate if this is likely to be the case.
4. No further guidance.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## REFERENCES

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

1, 15.

## IOGP REPORT REFERENCE

- R590 D 1.8 has generic guidance on fuel planning and is not specific to aeroplanes or helicopters. No 690 reference.

## FOR 02.07 Fuel Requirements – Helicopters

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-5:**

1. Establish and document flight planning procedures, in addition to, or in lieu of National Aviation Authority (NAA) requirements, to ensure aircraft depart with sufficient fuel reserves to avoid fuel exhaustion for the planned operations and additional reserves to cover deviations from the planned operations.
2. Include in fuel planning for an Instrument Flight Rules (IFR) flight:
    - Fuel used during start-up and taxi (Taxi Fuel);
    - Fuel required for the route to the first point of intended landing (Trip Fuel);
    - Fuel required for ground running on helideck or helipad; and,
    - Fuel required for the route to onshore alternate heliport or approved offshore alternate helideck (Alternate Fuel); and,
    - Contingency fuel as defined by the NAA, plus 30 minutes final reserve.
3. Include in fuel planning for Visual Flight Rules (VFR) offshore flights and/or in a hostile environment:
    - Fuel used during start-up and taxi (Taxi Fuel);
    - Fuel required for the route to the first point of intended landing (Trip Fuel);
    - Fuel required for ground running on helideck or helipad or approved offshore alternate helideck; and,
    - Fuel required for the route to an onshore alternate heliport or offshore helideck, plus 30 minutes final reserve.
4. Include in fuel planning for VFR onshore flights:
    - Fuel used during start-up and taxi (Taxi Fuel);
    - Fuel required for the route to be flown (Trip Fuel); plus
    - If operating by day with reference to visual landmarks, 20 minutes fuel at best range speed.
5. For all flights:
    - Extra fuel, at the discretion of the Pilot-in-Command (PIC) to cover deviations from planned operations; and,
    - Additional fuel if the aircraft operator's fuel policy includes planning to an isolated aerodrome.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## GUIDANCE

1. Sufficient fuel is in addition to unusable fuel as listed in the Rotorcraft Flight Manual.
2. Guidance on terms for IFR Flights:
    - Taxi Fuel - This should be total amount of fuel expected to be used for start-up and taxi including allowances for operation of ancillary equipment, local conditions at departure site, ice protection systems and APU if applicable, and any foreseeable delays prior to take-off;
    - Trip Fuel - Typically flight to the destination including take-off, climb, cruise, descent, approach and landing, considering departure and arrival routings, meteorological conditions and foreseeable delays due to air traffic routing or other situations;
    - Contingency Fuel - Typically represents 10% of the trip fuel.
    - Alternate Fuel - Typically Fuel for missed approach from the applicable MDA/DA at destination aerodrome to the missed approach altitude and transit to alternate, including climb, cruise, descent and approach and landing at the alternate, considering departure and arrival routings;
    - Final Reserve Fuel - Fuel should be sufficient to hold for of 30 minutes at holding speed at 1500ft above the destination in ISA calculated with the estimated landing mass on arrival above the destination or the alternate; and,
    - See **FOR 02.01** Flight Preparation – General Flight Planning, **FOR 02.03** Offshore Alternates - Helicopters - Planning and Execution, and **FOR 02.05** Flight Planning.
3. Guidance on Terms for VFR Flights offshore flights and/or in a hostile environment;
    - Taxi Fuel - Typically, the total amount of fuel expected to be used for start-up and taxi including allowances for operation of ancillary equipment, local conditions at departure site, ice protection systems and APU if applicable, and any foreseeable delays prior to take-off; and,
    - Additional fuel based on the rules of the State of the operator but normally 5% of the planned trip fuel should be considered, this is only used following a risk assessment based on an analysis of low fuel incidents in the operating area.
4. Guidance on Terms for onshore VFR Flights:
    - Taxi Fuel - Typically the total amount of fuel expected to be used for start-up and taxi including allowances for operation of ancillary equipment, local conditions at departure site, ice protection systems and APU if applicable, and any foreseeable delays prior to take-off.
    - Typically, if landing at the intermediate stop, and/or destination cannot be assured, consider adding an alternate and include the required fuel for the diversion in the planning.
5. No further guidance.

## REFERENCES

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-2, 27. Fuel planning.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 02.08 Aircraft Acceptance

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-5:**

1. Document Flight Crew responsibilities for using a Minimum Equipment List (MEL), Configuration Defect List (CDL) and Aircraft Technical Log (ATL).
2. Prohibit the aircraft to depart with a defect that has not been processed in accordance with the MEL/CDL;
3. Report and record in the ATL all known or suspected defects affecting the aircraft after every flight. The Pilot-in-Command (PIC) is responsible for this action and where there are no known defects, the PIC certifies in the ATL that no new defects exist (simply entering the words “Nil Defects” is acceptable).
4. Document a protocol for flight crew to debrief maintenance personnel post-flight.
5. Perform an exterior aircraft Pre-Flight Inspection prior to each flight, which is conducted by a member of the Flight Crew and includes Original Equipment Manufacturer (OEM) and operator defined safety critical items.
6. Perform an interior aircraft emergency equipment inspection prior to each flight, which is conducted by a member of the Flight Crew (or a designated, qualified Cabin Crew) and includes operator defined safety critical items.

### GUIDANCE

1. Contract requirements for a Minimum Departure Standard may also be included in Flight Crew responsibilities; and,
    - Tasks such as oil and hydraulic fluid uplift and tyre inflation may be considered as part of the pre-flight inspection. The related pre-flight inspection instructions should address the procedures to determine where the necessary uplift or inflation results from abnormalities and possibly requires additional maintenance action;
    - In the case of commercial air transport, an operator should publish guidance to maintenance and flight personnel and any other personnel performing pre-flight inspection tasks, as appropriate, defining responsibilities for these actions and, where tasks are contracted to other organisations, how their accomplishment is subject to the quality system. It should be demonstrated that pre-flight inspection personnel have received appropriate training for the relevant pre-flight inspection tasks. The training standard for personnel performing the pre-flight inspection should be documented.
    - See also **FOR 02.01** – Flight Preparation – Pre-Flight Planning
2. No further guidance.
3. See also – **ENG 02.05** Continuing Airworthiness – Aircraft Maintenance Records. Aircraft Operators should also document instructions for Pilots-in-Command (PIC) with respect to defects that occur in flight when landing offshore.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

4. No further guidance.
5. The exterior aircraft Pre-Flight Inspection should include the following safety items:
    - Pitot/static ports;
    - Locked or disabled flight controls (as applicable, depending on aircraft type);
    - Presence of frost, snow or ice on critical surfaces; and
    - Aircraft structural integrity (damage), and,
    - The pre-flight inspection is intended to mean all the actions necessary to ensure that the aircraft is fit to make the intended flight. These are typically:
        - A walk-around type inspection of the aircraft and its emergency equipment for condition including, any obvious signs of wear, damage or leakage. In addition, the presence of all required equipment including emergency equipment should be established;
        - An inspection of the operator's technical log as applicable to ensure that the intended flight is not adversely affected by any outstanding deferred defects and that no required maintenance action shown in the maintenance statement is overdue or will become due during the flight;
        - A control that consumable fluids, gases etc. uplifted prior to flight are of the correct specification, free from contamination, and correctly recorded;
        - A control that all doors are securely fastened;
        - A control that control surface and landing gear locks, pitot/static covers, restraint devices and engine/aperture blanks have been removed;
        - A control that all the aircraft's external surfaces and engines are free from ice, snow, sand, dust etc.and,
        - When a helicopter is conducting a rotors-running turn-round (RRTR) an exterior Pre-Flight Inspection is not required, however a visual examination of the helicopter should be performed by a Crew Member or by trained and competent ramp personnel or Helicopter Landing Officer (HLO) and then clearly communicated to the PIC.
6. No further guidance.

## REFERENCES

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- R590 implies, but does not specifically address requirements the mandatory requirements.
- IOGP 690 OHRP, 690-2 — 33. Pre-flight and post-flight procedures.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 02.09 Aircraft Documentation

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-2:**

1. Carry operational documentation on board the aircraft, in accordance with National Aviation Authority (NAA) requirements, with the documents accessible on the flight deck.
2. Carry and use only controlled documentation on board the aircraft.

### GUIDANCE

1. Aircraft documentation can be carried either in paper form or in an Electronic Flight Bag (EFB), which conforms to NAA regulation. The following documents should typically be considered in addition to, or in lieu of, NAA requirements:
    - Pertinent aeronautical charts;
    - Pertinent en-route, terminal area, and instrument approach procedure charts;
    - Aircraft performance data;
    - Aircraft checklists;
    - The approved Operations Manuals;
    - Standard Operating Procedures (SOP), where SOPs are established for the aircraft;
    - The aircraft flight manual;
    - The aircraft Minimum Equipment List (MEL) for aircraft being operated in accordance with a MEL;
    - Aircraft certificate of airworthiness or other flight authorisation documents and certificate of registration;
    - Aircraft radio licence;
    - Insurance certificate;
    - If Dangerous Goods are carried, the appropriate documentation, forms and guidance material for the Safe Transport of Dangerous Goods by Air;
    - Procedures for Pilots-in-Command of intercepted aircraft and visual signals for use by intercepting and intercepted aircraft, as contained in ICAO Annex 2; and,
    - For international commercial air transport operations, a certified true copy of the Aircraft Operator Certificate (AOC) including the authorisations, conditions and limitations relevant to the aircraft type.
2. All aircarft documentation should be subject to the operators controlled documents process.

### REFERENCES

- EASA-OPS — AMC 20-25: Airworthiness and Operational Consideration for Electronic Flight Bags (EFBs).
- FAA Advisory Circular AC 120-76C — Guidelines for the Certification, Airworthiness, and Operational Use of Electronic Flight Bag dated 05/09/2014.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- No clear reference in IOGP OHRP.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 02.10 Assessment of Wrong Deck Landing Risk

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-6:**

1. Establish procedures to manage and monitor the accuracy of flight planning information for fixed and moveable offshore helidecks and a procedure for flight crew to confirm the location of offshore destinations prior to departure.
2. Establish a process to identify the relative likelihood or risk (high, medium, or low) of a wrong deck landing at a particular destination or vessel during flight planning. This process considers factors such as the location of mobile installations and vessels, proximity of adjacent decks, physical similarity of adjacent installations or vessels, similarity in naming conventions, etc.
3. Procedures are in place to review this risk during all pre-flight briefings and discuss in pre-landing briefings (unless the likelihood or risk in that area is continuously low).
4. Document and implement procedures, and incorporate them into the normal checklists, to verify the destination position and facility name when approaching all vessels and installations.
5. Document a policy and procedures to apply, in case a wrong deck landing has occurred, including necessary communications and preparations for a subsequent safe departure.
6. Document a requirement to report a wrong-deck landing via the Air Operator's event reporting system to the helideck owner/operator and client including circumstances and learnings from the event.

### GUIDANCE

1. The procedure should also cover the management of such data in aircraft navigation databases, and to monitor the positions of vessels, in-flight as necessary.
2. This process should be reviewed with flight crews who are familiar with the area of operation, and previous Wrong Deck Landing incidents, both in the location and worldwide. If a high likelihood is identified, information should be provided to crews at the preflight stage.
3. No further guidance.
4. No further guidance.
5. No further guidance,

### REFERENCES

- UK CAA CAP 437
- UK Health and Safety Executive Report OTO 2000/067 Review Of Wrong Helideck Landings, Status Lights and Signalling Lamps
- HeliOffshore Wrong Deck Landings Research and Investigation Report

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, 690-2, 33. Flight procedures — Assessment of wrong deck landing risk.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 02.11 Helideck Operational Management

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-5:**

1. Only operate to moving helidecks when the reported motion is within limits for the helicopter as defined in the limits in the Helideck Certification Agency (HCA) Helideck Limitations List (HLL) Part C. These limits are only applicable for landing, not for takeoff. Where the National Aviation Authority (NAA) or local standards are more stringent, the more stringent requirements apply.
2. Require that when mandated by local operating requirements, and otherwise where available, electronic deck motion and wind monitoring equipment is used as defined in the United Kingdom (UK) Civil Aviation Authority (CAA) Civil Aviation Publication (CAP) 437. Where the National Aviation Authority (NAA) or local standards are more stringent, the more stringent requirements apply.
3. Document procedures, requiring that:
    - The helideck motion and wind information are available to and used by pilots for pre-flight planning;
    - Updated information is requested by the crew before landing, and at any time there is a significant change in conditions suspected;
    - The flight crew verifies that the reported helideck motion is within limits before landing;
    - The flight crew checks that the vessel intends to maintain the existing heading while the helicopter remains on the deck, or advises of any planned or actual heading changes.
    - Helicopter lands on the Touchdown/Positioning Marking Circle.
4. Establish procedures for flight crew to respond to any of the following:
    - The vessel goes off heading by 10° or more degrees while on the helideck;
    - There is a vessel/installation or station keeping/handling problem;
    - Helideck Motion exceeds the limits in the HCA HLL Part C or other NAA or local standards limits;
    - There is a significant change in the relative wind of 30° or more;
    - The helideck monitoring equipment indicates a red deck; and,
    - There is any other abnormal event, loss of Dynamic Positioning etc.
5. Prohibit helicopter operations in the vicinity of any installation during perforating operations and respect the 500m safety zone and radio silence when perforating operations are in progress.
6. Prohibit ground manoeuvring on all offshore helidecks except for those locations equipped with a purpose-designed helicopter parking area or hangar deck.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## GUIDANCE

1. The Helideck Certification Agency (HCA), Helideck Limitation List (HLL), Part C, provides greater detail on Pitch Roll and Heave (PRH) Limitation.
2. The UK CAA recommends that "all moving helidecks are equipped with electronic motion-sensing systems (i.e. Helideck Monitoring Systems (HMS) which are necessary to calculate Significant Heave Rate (SHR), and also provide an appropriate level of accuracy and integrity for all safety critical helideck motion information. A suitable HMS standard is published by the HCA (see **www.helidecks.org**).
3. When a vessel gives permission for a helicopter to land on deck, the vessel intends to maintain the existing heading while the helicopter remains on the deck. The monitoring station providing deck motion limits and wind data is manned during the entire time the helicopter is operating on the deck.
4. No further guidance.
5. No further guidance.
6. If there is an urgent need to allow another aircraft to land, or to deal with an unserviceable helicopter offshore, ground manoeuvring on helidecks follows a documented procedure and a Risk Assessment (RA) is carried out. The following conditions should be considered in the RA:
    - A normal departure to clear the deck is not possible;
    - There is no helideck landing net fitted;
    - The Helicopter Landing Officer (HLO) has been notified;
    - A full stop (full-down collective) has been completed; and
    - The Crew conducts a specific briefing that includes:
    - Actual wind speed and direction;
    - Cross wind limitations;
    - Risk of dynamic roll over; and,
    - Obstacle clearance.

## REFERENCES

- HCA HLL Part C Summary of Pitch, Roll & Heave Limitations.
- UK CAA CAP 437.
- Helicopter Safety Advisory Committee (HSAC) Recommended Practice (RP) Number 163, plus other RPs.
- ICS Guide to Helicopter-Ship Operations.

## RELATED INCIDENT

- Eurocopter AS332L2 G-BKZE on-board West Navion:
  **https://assets.publishing.service.gov.uk/media/5422ef9ced915d13740002ad/3-2004_G-BKZE.pdf**
- UK CAA Response:
  **https://publicapps.caa.co.uk/docs/33/factor200429.pdf**

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, 690-2, 23. Helidecks — Helideck landing limits, 24. Helidecks — Measurement of helideck motion, 25. Helidecks — Significant change in helideck conditions.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR.3 FLIGHT PROCEDURES

### FOR 03.01 In-Flight Operations

**MANDATORY REQUIREMENTS**

**The Aircraft Operator is Accountable for Requirements 1-8:**

1. Operate the aircraft at all times in accordance with the approved Aircraft Flight Manual (AFM).
2. Document flight procedures, to be used by the aircrew in the performance of their duties referencing the Flight Crew Operations Manual (FCOM), if available, which include, designated crew roles and responsibilities, use of checklists, automation policy, and crew monitoring procedures, including confirmation and cross-check of critical actions, mode settings, aircraft responses and deviation calls. The procedures are described concisely so that aircrew will recognise and act on deviations from standards in a timely manner.
3. Define the use of Crew Resource Management (CRM), Threat and Error Management (TEM), Aeronautical Decision Making (ADM) crew responsibilities, including pre-flight planning, adverse weather avoidance, arming of flotation gear (helicopters), awareness of potential birdstrike risk, and care of passengers.
4. Provide instructions for Flight Crews on monitoring weather, navigation performance in-flight and position information whilst en-route, to guide navigational decision-making.
5. Require Flight Crew to regularly check and record fuel status and the time over waypoints on the Operational Flight Plan (OFP) or equivalent.
6. Document and implement a sterile cockpit policy and procedures which, as a minimum, restricts unnecessary conversation, restricts activities to essential operational matters during critical phases of flight, and covers the use of Electonic Flight Bags (EFB) and Personal Electronic Devices (PED), paperwork, during flight below key altitudes and during certain phases of flight and ground operations.
7. Document and implement a policy for standard cockpit procedural phraseology including “Standard Call-Outs” for each phase of flight.
8. Require Flight Crew to conduct departure and approach briefings.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## GUIDANCE

1. No further guidance.
2. Designated responsibilities of Flight Crew members should include:
    - Cross-check of critical Flight Crew actions which should include:
        - Performance calculations, including AFS/FMS entries.
        - Changes to Auto-Flight System (AFS)/Flight Management System (FMS) and radio navigation aids during the departure or approach phase; and,
        - Transfer of controls;
        - Heading, altitude, altimeter and airspeed (bug) settings;
        - Configuration changes;
    - Policies on:
        - Manual and automatic flight.
        - Pilot Flying (PF)/Pilot Monitoring (PM) duties; and,
        - The use of checklists.
    - See also **FOR 01.03** – Flight Crew Responsibilities, and **FOR 01.07** – Automation Policy.
3. Threat and Error Management (TEM) is central to contemporary CRM and could be considered as “defensive flying”. It equips a pilot with skills and behaviour to recognise and avoid problems which, if ignored or left unattended, could result in an undesired aircraft state and possibly lead to an incident or accident. TEM proposes that threats, errors and even undesired aircraft states (such as an altitude deviation) are everyday occurrences that pilots must manage to maintain safety.
   TEM stresses three basic concepts to manage threats and errors – anticipation, recognition and recovery. Many of the best practices advocated by CRM can be considered threat and error management countermeasures. However, to take full effect, TEM needs to be not only defined as a framework, but also fully integrated in an operators procedures, training and checking. While TEM has been predominantly in use with Air Traffic Control and Flight Operations, the concept can have equal value in other areas, such as engineering, ground operations, etc.
4. The information monitored should include the status of the:
    - Destination;
    - Destination alternate (if applicable);
    - En-route alternate(s) (if applicable); and
    - Verifying present position.
    - See also **FOR 03.02** Adverse Weather
5. No further guidance

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See the **Change Log** for version control information.

6. The sterile or focused cockpit policy should also include:
    - Intra-cockpit and cabin/cockpit communication protocols during critical phases of flight;
    - Guidance on the mandatory use of headsets and boom microphones during critical phases of flight for the purposes of ATC communication;
    - Altitude and level changes, and initiation of changes in route clearances until the new routing is confirmed and established.
    - Restriction of activities to essential operational matters during critical phases of flight, which should include:
        - All ground operations
        - Take-off until the departure phase is considered complete
        - Approach and landing from when the approach and landing phase commences; and,
        - The Aircraft Operator should document the commencement and conclusion of the phases described above.
7. No further guidance.
8. Departure and approach briefings should include:
    - Threat and Error Management (TEM) assessment, covering as examples – Taxiway hotspots, weather, fatigue, unfamiliar airport, etc.;
    - Aircraft technical status'
    - Normal and non-normal departure and approach considerations; and,
    - Jump-seat/observer briefing.

## REFERENCES


- **Defensive Flying for Pilots: An Introduction to Threat and Error Management**, Ashleigh Merritt, Ph.D. & James Klinect, Ph.D., The University of Texas Human Factors Research Project, The LOSA Collaborative December 12, 2006.
- **"Approved Check Pilot Manual, 10th Edition"**, Transport Canada, TP6533, 2017
- **"Threat and Error Management (TEM) in Flight Operations"**, ICAO, reproduced on **www.skybrary.aero**, updated 2017


## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

1, 2, 6, 8, 15, 16.

## IOGP REPORT REFERENCES

- 590-D 3.1.1 addresses many of the requirements of FOR 03.01, but not to the level of specificity of the FOR 03.01.
- IOGP 690 OHRP, Section 690-2, 30 – Flight Procedures General; 690-2, 31. Flight procedures — Sterile cockpit.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 03.02 Adverse Weather

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-5:**

1. Develop and document an Adverse Weather Policy and procedures.
2. Clearly state in the policy under what conditions, offshore flying operations are to be restricted or temporarily halted, and the policy is supported by appropriate procedures.
3. The policy considers the aircraft type and survival equipment in use, the available Search and Rescue (SAR) capability and applicable Emergency Response Plans and is revised when material changes to these considerations occur.
4. Document and implement a policy for flight crews to monitor weather information whilst en-route including destination, destination alternate (when applicable), and en-route alternate (when applicable)
5. Document and implement a policy for wind shear avoidance and recovery.

### GUIDANCE

1. Adverse weather operating limits may be defined in the relevant company manuals and be developed in conjunction with the Shell Technical Authority - Air Transport (TA1);
2. Situations where offshore flying operations should be restricted can include:
    - Excessive wind over helidecks prohibiting personnel movement to and from the helicopter;
    - Significant Wave Height (SWH) over the ditching certified capability of the helicopter
    - Adverse sea conditions resulting in an unacceptable risk of immediate capsize, or preventing effective offshore search and rescue available for the area of operations;
3. No further guidance.
4. Policies for the monitoring of weather information whilst en-route should include instructions to avoid, and actions to recover from:
    - Thunderstorms and other adverse atmospheric conditions;
    - Lightning avoidance, including helicopter-triggered lightning;
    - Low visibility;
    - Icing;
    - Turbulence;
    - Wake turbulence - where applicable;
    - Micro-burst, jet stream, mountain waves, waterspout;
    - Contaminated landing surfaces - including the effect of type and depth of contaminants on performance;
    - Volcanic ash - where applicable; and,
    - Cold and hot weather operation;
5. Instructions and procedures for wind shear avoidance should include use of predictive equipment if fitted.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## REFERENCES

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- R590 implies a requirement to monitoring en-route weather; R590 does not cover wind shear avoidance and recovery.
- IOGP 690 OHRP, Section 690-2, 22. Aviation weather - Adverse weather policy.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 03.03 Ice Protection

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1 and 2:**

1. Document and implement policies and procedures for de/anti-icing and make these accessible to the Flight Crew.
2. The de/anti-icing policies include:
    - Use of holdover timetables;
    - Requirements for a member of the Flight Crew to perform a visual check of the rotor blades or wings and all critical surfaces just before take-off (as applicable), if contamination is suspected;
    - Requirement for the aircraft not to commence take-off unless the critical surfaces are clear of any deposits which might adversely affect the performance and/or controllability of the aircraft; and,
    - A statement that authorises the Pilot-in-Command (PIC) to obtain de-icing services whenever the PIC determines that it is necessary
    - Use of the aircraft's ice-protection systems in icing conditions' 'Deicing procedures' .

### GUIDANCE

1. No further guidance.
2. No further guidance.

### REFERENCES

### RELATED INCIDENT

### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

1, 2, 13, 15.

### IOGP REPORT REFERENCE

- No differences to R590, not included in IOGP 690.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 03.04 Guarding of Flight Controls

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-5:**

1. Require and document that the controls of a helicopter never be left unattended while either the engines are running or the rotors are turning.
2. Require a member of the flight crew to remain guarding the controls and only performing cockpit duties related to the identification of external hazards, including maintaining visual contact/observing helideck or ground crew and passenger movement around the aircraft, when loading or unloading passengers from helicopters with rotors running.
3. Require and document that the Pilot Flying (PF) is to physically restrict the flight controls when the other pilot leaves or returns to his seat when the rotors are turning.
4. Require and document that a pilot seat is occupied by a qualified person whenever an Auxiliary Power Unit (APU) is running, unless the Aircraft Flight Manual (AFM) allows for the APU to be run unattended.
5. Require and document that the PF is to guard the flight controls at all times when not carrying out other essential tasks when the aircraft is in a coupled autopilot mode (helicopters only).

### GUIDANCE

1. In the context of this requirement "engines" do not include an Auxiliary Power Unit (APU).
2. No further guidance.
3. No further guidance.
4. A policy should be in place to determine who is authorised to operate an APU on the ground.
5. For helicopter operations, the guarding of flight controls when the autopilot is coupled is usually considered necessary as many helicopter emergencies, or abnormal conditions require a rapid response. Guarding the controls should be defined as having the hands and feet resting near the cyclic, collective and pedals.

### REFERENCES

### RELATED INCIDENT

- **“Fatal 2009 Helicopter Accident near Houma, Louisiana”**

### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

6, 13.

### IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-2, 51, Role specific training — Control Guarding.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 03.05 Passengers – Crew Seats

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1 and 2:**

1. Prohibit passengers from occupying any crew seat (including jump-seat positions), except where the aircraft is certified for single-pilot operations, or prior approval has been granted by the Shell Technical Authority – Air Transport (TA1).
2. Meet the following conditions for every flight when a passenger occupies a crew seat or a jump seat:
    - The Pilot-in-Command (PIC) is satisfied that no safety or security risk is involved;
    - The flight controls are either removed or safeguarded in such a way that the rudder/tail rotor pedals or the control column/cyclic stick/collective lever cannot inadvertently be knocked by the passenger if occupying the co-pilot's seat; and,
    - A separate briefing covering any items that may differ from the standard passenger briefing is given. In particular:
        - How to use any Flight Crew emergency exits;
        - Ensuring the controls are not interfered with; and,
        - Highlighting switches or controls that may be vulnerable to interference.

### GUIDANCE

1. No further guidance.
2. No further guidance.

### REFERENCES

### RELATED INCIDENT

### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

### IOGP REPORT REFERENCE

- R590 nor 690, do not address all requirements and does not address the necessity for Shell approval.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 03.06 Flight Following

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-7:**

1. Develop and implement a flight following policy and procedures to ensure timely alerting and location identification to aid Search and Rescue Services (SAR).
2. Install a Satellite Flight Following System (SFFS) that records the aircraft position when the aircraft is outside effective Air Traffic Control (ATC) surveillance service (Radar, Voice or Automatic Dependent Surveillance – Broadcast (ADS-B).
3. Set the satellite position reporting frequency to a maximum interval of two minutes.
4. Show the status of individual aircraft positions on a monitor, which is in direct view of trained personnel who keep the aircraft under constant surveillance during the whole flight when satellite tracking is in use; and provide dedicated personnel who monitor and intervene when SFFS polling is interrupted (loss of reports) or if SFFS distress modes are activated.
5. Maintain a reliable means of direct communication between the aircraft and flight follower throughout the flight. When the aircraft is not under ATC surveillance, Contractor's flight following personnel are able to initiate the Emergency Response Plan in the event of distress or loss of communications.
6. When the aircraft is not under ATC surveillance and the satellite flight following system is inoperative, procedures are in place for regular "ops normal" calls at least every 15 minutes. Such calls include heading, speed, position, and are recorded in a log, with the flight following personnel able to initiate the Emergency Response Plan, when required.
7. Document job descriptions that include the roles and responsibilities for flight following positions, the associated training requirements, and the process by which their ongoing competencies are assured. The documented training requirements adequately address management of the flight following function in both normal and emergency operations.

### GUIDANCE

1. Flight following provisions should:
    - Include a system description, all normal, abnormal and emergency response procedures, and such information is readily available to personnel involved in flight following and any other relevant personnel; and,
    - Require monitoring whenever aircraft are airborne.
2. Effective Air Traffic Control (ATC) surveillance services can vary by country and region. The operator should be able to provide evidence that the system is effective.
3. If an Aircraft Operator provides a centralised flight following function from a remote location (e.g. as part of a regional operations centre), at least one additional ground station, or access to a web-based system, should be readily available at the base of operations for continuous, local monitoring.

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4. No further guidance.
5. Where a Radio Flight Watch service is provided, radio operators should have any applicable licences and can communicate in English, or the approved language of the operation.
6. No further guidance.
7. The personnel involved in flight following, whether full or part-time, should:
    - Receive annual and recurrent training on the relevant sections of the Aircraft Operator's manuals, including indoctrination training, specific flight following content, and the procedures to follow in the event of overdue or lost aircraft;
    - Participate in annual emergency response drills;
    - Complete an annual competence evaluation; and,

## REFERENCES

- ICAO Global Aeronautical Distress & Safety System (GADSS).

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

12, 14, 16.

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-2, 35 — Flight following.

## FOR 03.07 Passenger Briefing

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-8:**

1. Brief passengers on emergency procedures and other safety matters prior to flight. A video briefing is the preferred delivery method; this may be supplemented or replaced by an aircrew briefing. Briefings are delivered in the language(s) appropriate to the passengers and crew.
2. Tailor passenger briefings to the specific design features and equipment of the aircraft to be used. If there are minor differences in configuration between the briefing and aircraft to be used, a supplementary briefing on the aircraft or using illustrations of the differences is provided before flight. Differences are minor if they are easy to understand and identify on the aircraft, do not introduce risk of injury if misused and have no adverse effect on survivability.
3. Briefings are valid for 24 hours, after which a fresh briefing is delivered.
4. Provide a safety briefing card for each passenger seat containing information on safety equipment and emergency procedures. The cards use graphics with international symbols, or have information added in the local language(s) if required, and are specific to the aircraft configuration.
5. Include in all passenger briefings a description of, or instructions on:
    - The danger areas of rotors, jet engines, turning propellers as applicable;
    - Procedures for boarding and exiting the aircraft, including location and operation of doors, emergency exits and push out-windows; and not to inflate life jackets until outside the aircraft
    - A prohibition on smoking in or around the aircraft and apron area; location of and compliance with non-smoking signs;
    - The location of, and requirement to read, the safety briefing card
    - The location and use of seat belts, including shoulder harnesses when fitted, and an instruction that they are worn during landing and take-off in aeroplanes whenever the “fasten seat belt” sign is on, other than when embarking/disembarking;
    - The requirement for passengers to remain seated, with their seat belts fastened, until the crew tells them to disembark;
    - Location of "fasten seat belt" signs;
    - Proper stowage of any hand-carried item;
    - Leaving personal belongings behind in the event of an evacuation – as applicable;
    - Policy and use of personal electronic devices (laptops, mobile phones etc.);
    - Location of emergency and lifesaving equipment such as fire extinguishers, first aid kit, life vests, life rafts, survival gear and Emergency Locator Transmitters (ELTs) and Emergency Position Indicating Radio Beacons (EPIRBs) if fitted;
    - The location and use of oxygen masks, if applicable;
    - Means of communication between crew and passengers in the event of an emergency, and for passengers to inform the flight crew if they notice anything untoward, but not during take-off or landing;
    - Actions in the event of an emergency, including the brace position for an emergency landing.

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6. Include in the helicopter specific passenger briefing:
    - A general description of the aircraft and the danger areas around main and tail rotors, including safe and unsafe directions of approach and the danger of blade sail during rotor start or shutdown;
    - Instruction on the use of the provided hearing protection;
    - How survival suits are to be worn, if required, including use of hoods, gloves and emergency breathing systems, and the need for “suits fully zipped and hood on” when advised by the flight crew;
    - Procedures for boarding and exiting the aircraft. Passengers are required to remain seated until instructed by the Pilot, Helideck Landing Officer (HLO), Helideck Attendant (HDA), or other designated personnel open the doors and instruct them to disembark;
    - Proper storage of hand carried items, only small, soft items such as a paperback book may be carried inside the passenger cabin of helicopters;
    - Instructions that smoking and the use of electronic cigarettes are prohibited at all times in aircraft, or on the aircraft movement area;
    - Instructions that seat belts and shoulder harnesses are required to be worn at all times, other than when embarking/disembarking;
    - The location and operation of doors, emergency exits, emergency and lifesaving equipment such as fire extinguishers, first aid kits, life jackets, life rafts, survival gear, and emergency radio equipment (ELT and EPIRBs); and,
    - Procedures for evacuating an aircraft in the event of an emergency landing on the water or ditching, including the use of reference points for orientation, reminders to not inflate life jackets until outside the helicopter and not to disembark the aircraft while the rotors are turning.
7. Where a video briefing has been provided by someone other than the crew of the aircraft, the passenger manifest is signed to certify that passengers received the appropriate briefing.
8. When passenger transfer involves Commercial Air Transport (CAT) Helicopter Hoist Operations (HHO), i.e. non-emergency hoist transfer, the passenger is briefed prior to each flight, on the ground, without time pressure. The briefing covers emergencies including the wearing and use of survival equipment, HHO procedures and crew signals, including practising donning and using the lifting strop.

## GUIDANCE

1. No further guidance.
2. No further guidance.
3. In locations where some passengers do not fully understand the language used for the briefing, the video contains subtitles, or there is a video in the local language, or a translator is provided if necessary.
4. No further guidance..
5. Where Personal Electronic Devices are allowed to be carried, guidance on their use and stowage should be included. The recognised brace position for helicopters is as follows:
    - Chin on sternum for forward facing seats and head against headrest for rearwards facing seats;
    - And we are suggesting holding on to the seat, or suit if seat cannot be readily accessed
    - This is based on FAA, Transport Canada, EASA research and has been confirmed by UK CAA Safety Research Committee

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

6. Additional briefing items for helicopter flight could also include a description of, or instructions on, when appropriate:
    - Not approaching a helicopter from the rear and not proceeding any further aft of the baggage compartment door than is necessary for the retrieval of baggage or cargo;
    - Always approaching and leaving the helicopter from the side, within view of the Pilot or Crew member;
    - Hand-carrying hats, glasses, and caps to prevent them from being blown away by the main rotor wash;
    - Long objects over 1 metre to be carried flat to avoid contacting the main rotor blade;
    - A prohibition on passengers disembarking from, or approaching a helicopter on the up-slope (high) side when the aircraft is on sloping ground;
    - A prohibition on personnel approaching a helicopter during start-up or shutdown; and,
    - The method of egress in the event of a roll-over accident in wide-body helicopters (1.8 metre cabin width or greater) is by use of the under-seat frame of the transverse cabin seats as a ladder;
    - Additional briefing items for offshore helicopter flights could include:
        - In the event of an emergency landing on the water, instructions not to evacuate the helicopter until the rotor has stopped, unless instructed otherwise by the Pilot in Command;
        - Instructions that the seat belt must only be released after the cabin window has been pushed out (or confirmed that is has been pushed out if not sitting next to the window);
        - The proper use of reference points for orientation during the event of a rollover ditching; and,
        - Instructions on the carriage of loose articles in the aircraft that could present Foreign Object Damage (FOD) risk or impede egress in the event of ditching.
7. No further guidance.
8. See **SPO 06.01** Helicopter Hoist Operations for a full description and requirements for hoisting operations.

## REFERENCES

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

1, 3, 4, 5, 6, 8, 12, 14, 15.

## IOGP REPORT REFERENCE

- IOGP OHRP, 690-3, 7. Passenger briefing.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 03.08 Role Specific Training – Helidecks

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-5:**

1. Conduct helideck approaches such that the helicopter lands with the pilot's seat over the Touch Down/Position Marking (TD/PM) Circle.
2. Develop an annual training programme to include:
    - Information on helideck design and markings, including as a minimum, the chevron, TD/PM, D value and t value, Limited Obstacle Sector (LOS), 1:5 falling gradient and Helideck Monitoring System (HMS);
    - The significance of the alignment of the H with regard to the Obstacle Free Sector (OFS);
    - The correct approach path; and,
    - Correct use of the TD/PM circle and relative positioning to ensure clearance from obstacles and enable safe passenger movement on deck.
    - Procedures for ground manoeuvring on offshore helidecks with helicopter parking areas and hangar decks.
3. Develop a written syllabus for training of aircrew engaged in flights to small and medium size vessels while underway which includes:
    - Differences in approach/departure procedures for vessels under way and the effect this has on relative wind and turbulence at the various helideck positions; and,
    - Differences in the location of the helideck (bow/stern/midships) and the effect this has on helideck movement.

### GUIDANCE

1. Repositioning to clear the tail rotor of the helicopter from access points or to align the aircraft for passenger/cargo loading or refuelling should normally be conducted in the hover, using the TD/PM circle as a manoeuvre reference and observing any crosswind limitations. A TD/PM marking is located so that when the pilot's seat is over the marking, the whole of the undercarriage will be within the circle and all parts of the helicopter will be clear of any obstacle by a safe margin (ICAO Annex 14, 5.2.10.2).
2. The training should also cover other markings that are specific to the region and local requirements in place, and be recorded in an appropriate system, see also **FOR 02.11** Helideck Operational Management.
3. Training should be recorded in an appropriate system, see also **FOR 02.11** Helideck Operational Management.

### REFERENCES

- UK CAA CAP 437

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

None.

## IOGP REPORT REFERENCE

- IOGP OHRP, 690-2, 50: Role Specific Training – Helideck

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 03.09 Stabilised Approach

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-6:**

1. Document stabilised approach procedures and define when to conduct a missed approach or to abort a landing if the deviation criteria for a stabilised approach are not met.
2. Procedures confirm that for both helicopters and aeroplanes:
    - The flight path is monitored and there is a requirement to announce deviations and subsequent actions using specified criteria;
    - The aircraft is on the correct flight path and only requires small changes in heading, attitude and power to remain on the correct flight path;
    - Unique approach procedures or abnormal conditions that require a deviation from stabilised approach criteria require a special briefing;
    - The aircraft is in the correct landing configuration and all briefings and checklists have been conducted;
    - Landings are only to be made from a stabilised approach;
    - Procedures are in place for no-fault, mandatory go-arounds when any approach is not stabilised, and pilots practice all-engine operating (AEO) go-arounds as part of their proficiency training; and,
    - Procedures are in place, using deviation criteria, to brief or announce deviations from a stabilised approach.
3. Procedures for offshore helicopters:
    - Are written with reference to the HeliOffshore Flightpath Management Recommended Practices (HO-FPM-RP-v2.0);
    - Are specific to the helicopter type or use a Type Certificate (TC) Holder issued Flight Crew Operating Manual (FCOM);
    - Are characterised by defined speeds, climb/descent rate, vertical flight-path and configuration, through a series of defined ‘gates’ as necessary;
    - Confirm the power setting is appropriate for the helicopter configuration, not below the manufacturer’s minimum if specified in the Rotorcraft Flight Manual (RFM) or FCOM;
    - For any onshore segment, to airfields and prepared helipads:
        - Approaches are stabilised by 1000 feet above approach minima, but no later than 500 feet above approach minima on an IFR approach; and on a VFR approach by 500 feet above the airport elevation;
        - All instrument approaches are flown in accordance with published instrument procedures;
        - Instrument approaches such as ILS, LPV, LNAV/VNAV and LOC/VOR are flown within one dot of the glideslope and/or localiser (or course deviation indicator); and,
        - During circling approaches the bank angle does not exceed 20°, the helicopter is wings level on final by no later than 200 feet above airport elevation.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

4. Procedures for aeroplanes confirm that:
    - The approach is stabilised by 1,000 ft. above airport elevation when conducting an IFR approach and 500 ft. above the airport elevation when conducting a VFR approach;
    - All instrument approaches are flown in accordance with published instrument procedures;
    - Precision approaches such as ILS , LPV and LNAV/VNAV are flown within one dot of the glideslope and localiser (or course deviation indicator);
    - The airspeed is not more than Vref +20 knots indicated airspeed and not less than Vref, unless otherwise recommended by the manufacturer;
    - The sink rate is no greater than 1,000 ft. per minute unless otherwise recommended by the manufacturer, or required for a specific, published approach;
    - During circling approaches the bank angle does not exceed 30 degrees, the aeroplane is wings level on final by no later than 300 ft. above the airport elevation: and,
    - There are documented flight path monitoring procedures, using deviation criteria, to brief or announce deviations from a stabilised approach.
5. Procedures confirm that the approach is stabilised from the point of starting the final descent for landing and in any case before Landing Decision Point (LDP) +50 ft, for helicopters conducting specialised roles to unprepared or temporary landing locations.
6. Validate, using the Flight Data Monitoring (FDM) programme, the stabilised approach procedures, and the identification of any specific risks in the conduct of the flight procedures.

## GUIDANCE

1. Non-precision approaches should be flown using the Continuous Descent Final Approach (CDFA) technique. The technique is consistent with stabilized approach procedures and has no level-off. A CDFA starts from an altitude/height at or above the FAF and proceeds to an altitude/height approximately 50 feet above the landing runway threshold or to a point where the flare manoeuvre should begin for the type of aircraft being flown. Where available the aircraft's FLight Management System (FMS) should be used to fly the CDFA by generating a virtual glide path (VGP).
2. Crews should brief specifically what the aircraft configuration is to be and by when (e.g. automation on, gear down by 1500 ft, speed if above Vapp etc.) and to be clear of what is expected of the Crew if those targets are not met. This could be considered a gate prior to the 1000 ft AAL stabilised approach gate on an instrument approach.
3. For helicopter the HeliOffshore Flight Approach Path Management Recommended Practice (HO-FPM-RP-v2.0) should be used in total, as guidance by Offshore Helicopter Operators when developing its Stabilised Approach Procedures.
4. For aeroplanes the Flight Safety Foundation – Approach and Landing Accident Reduction Task Force (V1, Nov 2009) – was used as the basis of the FW Stabilised Approach procedures and should be referenced by operators when developing its procedures. Operators should consider establishing a minimum ceiling requirement which is above the Minimum Descent Altitude (MDA). While circling can be done at the published MDA, clear of cloud (ceiling marginally above MDA) this introduces the risk of entering IMC at a critical phase of flight, specifying a ceiling of MDA plus 300 feet could mitigate this risk. In addition, consider adding circling correcting limits of +100/-5 ft briefed circling altitude; >30 degrees bank angle; Airspeed +10/0 kts

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

5. Specialised roles for helicopters could be:
    - Low-level Search and Rescue (SAR);
    - Onshore utility helicopter operations;
    - Onshore survey activities, wildlife, geomatic, photography etc.; and,
    - Long line and seismic.
6. See also **FOR 08.01** – Flight Data Monitoring

## REFERENCES

- **https://flightsafety.org/wp-content/uploads/2016/09/EPMG.pdf**
- **https://www.skybrary.aero/index.php/Flight_Safety_Foundation_ALAR_Toolkit**

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-2, 32 — Flight procedures — Stabilised Approaches.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 03.10 Performance – Fixed Wing

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1 and 2:**

1. Conduct fixed-wing operations using Performance Class A (PC A) aeroplanes, except in defined situations.
2. PC B and PC C aeroplanes are only used subject to:
    - A documented risk assessment for the specific operation; and
    - Approved by the Shell Technical Authority - Air Transport (TA/1).

### GUIDANCE

1. See also **FOR 01.06 Single-Engine Aircraft.** Performance class A aeroplanes are multi-engined aeroplanes powered by turbo-propeller engines with a Maximum Operational Passenger Seating Configuration (MOPSC) of more than nine or a maximum take-off mass exceeding 5700 kg, and all multi-engined turbo-jet powered aeroplanes. Where an aircraft's OEI performance does not meet the published departure climb gradient, approved OEI departure procedures specific to the aircraft and runway being used may be flown.
2. Performance class B aeroplanes are powered by propeller engines with a MOPSC of nine or less and a maximum take-off mass of 5700 kg or less; and Performance class C aeroplanes are powered by reciprocating engines with a MOPSC of more than nine or a maximum take-off mass exceeding 5700 kg.

### REFERENCES

- EASA CAT.POL.A.200.

### RELATED INCIDENT

### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

1.

### IOGP REPORT REFERENCE

- Not listed in 590 or 690.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 03.11 Performance – Helicopters

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-6:**

1. Carry out all Commercial Air Transport (CAT) operations to offshore destinations in Performance Class (PC) 1, PC2E, PC2DLE, or PC2.
2. Conduct onshore take-offs, departures, approaches, and landings for the purpose of carrying passengers in accordance with PC1 criteria, unless specific circumstances dictate the use of PC2 criteria and then only when a safe forced landing can be assured in the event of a critical power unit loss.
3. Conduct performance planning for offshore take-offs, departures, approaches and landings, so there is no exposure to deck edge strike or to a forced landing in the event of a critical power unit loss.
4. Use Original Equipment Manufacturer (OEM) performance criteria using Rotorcraft Flight Manual (RFM) PC1/PC2/PC2DLE/PC2e flight profiles, both onshore and offshore as appropriate.(Note – It is acceptable to vary from flight profiles if it is published in the Operations Manual, provided that the aircraft mass is in accordance with the approved performance data.)
5. Use PC1 criteria based on the relevant RFM training Restricted Take-off Mass (RTOM) data when conducting simulated One-Engine Inoperative (OEI) training in an actual aircraft.
6. Performance Class 3 (PC3) operations carrying passengers, or any operations conducted in a hostile environment are only used subject to:
    - A documented risk assessment for the specific operation; and
    - Approval by the Shell Technical Authority - Air Transport (TA/1).

### GUIDANCE

1. Performance Class:Helicopters operating in PC1 or PC2 are certificated as Category A.
    - Helicopters certified according to any of the following standards are considered to satisfy Category A criteria, provided they have the necessary performance information published in the RFM and eligible for PC1 or PC2 operations:Certification as Category A under CS-27 or CS-29;
    - Certification as Category A under JAR-27 or JAR-29;
    - Certification as Category A under FAR Part 29;
    - Certification as group A under BCAR Section G; and,
    - Certification as group A under BCAR-29;
    - In addition to the above, certain helicopters are certified under FAR Part 27 and in compliance with FAR Part 29 engine isolation requirements specified in FAA Advisory Circular AC 27-1. Helicopters meeting these additional requirements are considered equivalent to Category A;
    - PC2e and PC2 without exposure derive from European terminology and rulemaking and not all OEMs use these expressions;
    - Where an OEM defines specific PC1 procedures for offshore helidecks they can also be considered as PC2e;
    - Where an RFM contains procedures and data to support elevated heliport operations with Category A performance, or without exposure to deck edge strike and a forced landing, these may be considered to meet PC2e criteria.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

2. Typically, offshore helicopter operations depart and return to heliports and airports that are relatively close to the coast, and in benign topographical environments. Consequently, it is important for Aircraft Operators to take into consideration the following elements of performance planning:
    - OEI climb gradient compatibility with Standard Instrument Departures (SID), and alternative emergency procedures to be followed in the event of a critical power unit failure in IMC on an IFR departure;
    - Similarly, OEI climb gradient capability in the event of a missed approach from an instrument approach to Decision Height (DH)/Missed Approach Point (MAP) either with an existing engine shutdown or with a failure at a critical phase of the missed approach; and,
    - En-route OEI performance considering Minimum Safe Altitude (MSA)/Minimum En-route Altitude (MEA) and required drift-down.
3. No further guidance.
4. No further guidance.
5. No further guidance.
6. The documented risk assessment should cover:
    - Type of operation;
    - Helicopter type, equipment fit and modification status;
    - Engine reliability;
    - Availability of forced landing sites.

## REFERENCES

- ICAO Annex 6 – Part 3 Operation of Aircraft – International Operations – Helicopters
- **EASA AMC/GMC to Part CAT (CAT.OP.MPA.305)**

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-2, 9. Helicopter performance class.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 03.12 Use of Oxygen

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-4:**

1. Require each Crew Member to wear an oxygen mask and use supplemental oxygen for any part of the flight at cabin pressure-altitudes above 10,000 ft. (700 hPa) but not exceeding 13,000 ft. (620 hPa) that is more than 30 minutes in duration.
2. Require all persons on board the aircraft to wear an oxygen mask and use supplemental oxygen at cabin-pressure-altitudes above 13,000 ft. (620 hPa).
3. Require the Pilot at the flight controls to wear an oxygen mask and use supplemental oxygen if an aircraft is not equipped with quick-donning oxygen masks and flying above FL250.
4. Require the Pilot at the flight controls to wear use an oxygen mask and use supplemental oxygen if the other Pilot leaves the flight deck for any reason above FL 350, except in defined situations.

### GUIDANCE

1. No further guidance.
2. No further guidance.
3. No further guidance.
4. When an aircraft system initiates an automatic emergency descent following depressurisation and without pilot input, the level may be increased to FL450 and Automatic Descent Mode (ADM) is one example of an aircraft systems for automatic emergency descent following depressurisation.

### REFERENCES

### RELATED INCIDENT

### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

1, 8.

### IOGP REPORT REFERENCE

- Not listed in 590 or 690 OHRP.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 03.13 Bird Strike Avoidance

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-3:**

1. Establish procedures to minimise the risk of birdstrikes and conduct and document a risk assessment detailing aircraft routing, which considers bird sanctuaries, known nesting areas, and migratory bird paths as far as practical.
2. Document speed limits and altitude in areas where a bird strike risk is identified defined;
    - Transit levels are at the highest practicable altitudes above those identified in the risk assessment, except during take-off and landing; and,
    - Airspeed is reduced to below 100kts, when below 1000' AGL/AMSL, for all helicopters, and for those aeroplanes able to safely operate at these airspeeds.
3. Awareness of bird avoidance techniques for crews forms part of the annual recurrent training program or is conducted within annual simulator training exercises.

### GUIDANCE

1. Where a risk is identified the following mitigations include:
    - Use of FAR Part 29 Helicopters fully compliant with Amendment 45, Para 29.631; (Refer to EASA and FAA reports highlighted below);
    - Pulsed landing lights, where available, are switched on when transiting risk areas;
    - Pilots wearing helmets with visors down for all single-pilot operations;
    - If helicopters are not Part 29 etc., pilots wear safety glasses for all flights in multi-crew operations, unless wearing helmets with visors down;
    - Replacement windscreens should be supplied by the Original Equipment Manufacturer (OEM), windscreens that have not demonstrated compliance with the original certification requirements should not be used, regardless of whether an approved Supplemental Type Certificate (STC) is in place; and,
    - As part of the Risk Assessment, any bird migration in the operating area as published in the National Aeronautical Publication (AIP) section ENR 5.6 BIRD MIGRATION AND AREAS WITH SENSITIVE FAUNA OR ANY OTHER NATIONAL PUBLICATION should be addressed.
    - Where is not practically achievable, e.g. for global random operations (e.g. Fleet) often operating in a heavily regulated radar or congested terminal environments, the inclusion of bird hazards in an airport categorisation, risk and threat assessment process is an acceptable means of compliance.
2. No further guidance.
3. Flight Data Monitoring systems should be used by the Aircraft Operator to verify compliance with the flight profiles used for bird strike prevention.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

Document links for Guidance in 1 are:

- **https://www.faa.gov/regulations_policies/rulemaking/committees/documents/media/ARAC%20RBSWG%20Final%20Report.pdf**
- **https://www.easa.europa.eu/sites/default/files/dfu/Final%20report%20Bird%20Strike%20Study.pdf**

## REFERENCES

- **Height Distribution of Birds Recorded by Collisions with Civil Aircraft**.
- UK CAA CAP772 Wildlife Hazard Management at Aerodromes.
- **https://ad.easa.europa.eu/blob/EASA_SIB_2021_07.pdf/SIB_2021-07_1**

## RELATED INCIDENT

Jan 2009 S76C++ fatal accident following bird strike, Louisiana.

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-2, 37. Birdstrike avoidance.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 03.14 Float Arming – Helicopters

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirement 1:**

1. Document a requirement for pilots to arm the Emergency Flotation System for all over-water departures and arrivals.

### GUIDANCE

1. Guidance on the avoidance of inadvertent deployment of the flotation system should be covered as part of the training syllabus.

### REFERENCES

### RELATED INCIDENT

### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

1, 6, 10, 13.

### IOGP REPORT REFERENCE

- IOGP OHRP 690-5, 16 — Flotation gear.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR.4 QUALIFICATIONS AND EXPERIENCE

### FOR 04.01 Flight Crew Qualifications

#### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-3:**

1. Require Flight Crew to hold a current and valid licence as specified by the applicable National Aviation Authority (NAA), including medical certification, aircraft type rating and radiotelephony licence.
2. Require the Cabin Crew to complete the NAA-approved Aircraft Operator's ground and flight training programme.
3. Require each Crew member, other than a flight or a Cabin Crew member, who is assigned duties on board an aircraft during flight time, to complete the operator's ground and flight training programme.

#### GUIDANCE

1. Flight Crews meet the licence, medical and rating requirements specified in Annex 1 to the Convention on International Civil Aviation (ICAO) when operations are conducted outside the national airspace of the State of issue of the Flight Crew licence, and demonstrate the ability to meet the language proficiency requirement in accordance with para 1.2.9.4 of ICAO Annex 1, in the language used for radiotelephony communications to at least ICAO level 4. Note – In some countries Pilots conducting non-scheduled, charter and helicopter operations may not be entitled to hold an Air Transport Pilot's Licence (ATPL). If this is the case, a Commercial Pilot's Licence (CPL) is considered acceptable.
2. No further guidance.
3. No further guidance.

#### REFERENCES

#### RELATED INCIDENT

#### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

None.

#### IOGP REPORT REFERENCE

- Not listed in IOGP 690 OHRP, Aligned with IOGP 590.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 04.02 Flight Crew Qualifications and Experience – Fixed Wing

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirement 1-5:**

1. Schedule fixed-wing Flight Crew with flying experience and qualifications as specified according to the Maximum Certified Take-Off Mass (MCTOM) of the aircraft.
2. Qualifications and experience are as follows:
    - 

| | | Above 5,700kg MCTOM & All Jets | Turboprop below 5,700kg MCTOM(1) | Piston Engine below 5,700kg MCTOM |
|---|---|---|---|---|
| **PILOT-IN-COMMAND (PIC)** | | | | |
| **QUALIFICATIONS** | Licences | ATPL(A) | CPL(A) | CPL(A) |
| | Type rating on contract aircraft | Current | Current | Current |
| | Instrument rating on contract aircraft(1) | Current | Current | Current(2) |
| **EXPERIENCE Not less than** | Total hours | 4,000 | 3,000 | 1,500 |
| | Total hours PIC(2) | 2,500 | 1,500 | 1,000 |
| | Total hours PIC - multi-engine(2) | 2,000 | 1,200 | 750 |
| | Total hours PIC of gas turbine or jet aircraft(3) | 500 | 500 | |
| | Total hours PIC on contract type | 100 | 100 | 100 |
| **CO-PILOT** | | | | |
| **QUALIFICATIONS** | Licences | CPL(A) | CPL(A) | CPL(A) |
| | Instrument rating on contract aircraft(2) | Current | Current | Current(2) |
| | Type rating on contract aircraft | Current | Current | Current |
| **EXPERIENCE** | Total Hours | 1,00 | 500 | 500 |
| | Total hours on multi-engine aircraft(3) | 500 | 250 | 250 |
| | Total hours on gas turbine aircraft(3) | 250 | 100 | |
| | Total hours PIC of multi-engine aircraft(3) | 150 | | |
| | Total hours PIC(3) | | 100 | 100 |
| | Total hours on contract type(3) | 50 | 50 | 50 |

Notes:

1. *All Beechcraft KingAir series aircraft are classed as below 5700kgs;*
2. *Requirement for Instrument Rating (IR) in all cases;*
3. *These hours to be fully on aeroplanes. Up to 10% may be achieved in a full flight simulator (FFS).*

Terms in green are included in the **SGRAO Glossary**.
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| BOTH PIC AND CO-PILOT | | |
|---|---|---|
| QUALIFICATIONS | Medical certificate appropriate for licence | Current for all |
| | Crew Resource Management (CRM) or Aeronautical Decision Making (ADM) | Annual |
| | Dangerous Goods (DG) awareness | Every 2 years |
| RECENT EXPERIENCE | Not less than Total hours previous | 50 Hours in 90 days, 10 Hours in aircraft type including 3 take-offs and landings |
| | Night recent experience previous 90 days | 3 night take-offs and landings at a typical operational location (see **FOR 05.02**) |

| FLIGHT ENGINEERS | | | | |
|---|---|---|---|---|
| | Licence | 2nd Class | | |
| | Total flight hours | 2,000 | | |
| **NAVIGATORS** | | | | |
| | Licence | 1st Class | | |
| | Total flight hours | 2,000 | | |
| | Minimum navigator hours | 1,000 | | |

3. Relevant Role Experience – Specific specialist experience requirements are provided for activities such as pipeline aerial patrols, airborne pollution control, top dressing, and aeromagnetic surveys.
4. Co-Pilot alternative experience requirements, In those cases where a Co-Pilot has no opportunity to accumulate 50 hours on the contract type, then variations may be allowed.
5. Ab-initio and low-experience pilots – The Aircraft Operator's pilot progression programme is approved by the Shell Technical Authority – Air Transport (TA/1).

## GUIDANCE

1. No further guidance.
2. No further guidance.
3. Relevant Role Experience – Refer to the applicable section in AOR Specialised Operations (SPO);
4. Co-Pilot alternative experience requirements – The Aircraft Operator should contact the Shell Technical Authority – Air Transport (TA/1) for information and approval.
5. Ab-initio and low-experience pilots – Specific programmes for low-experience pilots meet the requirements of IOGP Report 590-C (Section 1.4) Alternatives to IOGP recommended experience levels, which allows for the programme to "apply to either helicopter or fixed wing";, and before flying for Shell, low-experience pilots have completed Stage 7 within the programme described in Report 590-C (Section 1.4) Table 5 - Ab-initio and low-experience pilot training and progression for multi-crew offshore helicopter pilots.

## REFERENCES

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- Aligns with IOGP 590.

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## FOR 04.03 Flight Crew Qualification and Experience – Helicopters

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-9:**

1. Schedule helicopter Flight Crew which are licensed and current in accordance with National Aviation Authority (NAA) requirements and meet the required experience and qualification levels.
2. Flight crew demonstrate the specified experience and qualification levels by one of three methods:
    - **Method 1** - Ab-Initio Entry Competency Based-Programme;
    - **Method 2** - Commercial Pilot Licence (CPL) Entry Competency-Based Programme; or,
    - **Method 3** - Experienced Flight Crew – Alternative requirements.
3. The Operator demonstrates compliance with the chosen method through its training and assurance processes and is able to demonstrate, on audit and on request, that:
    - There is a formal, modular, competency-based progression scheme for pilots from basic (ab initio/new hire/conversion) to command and for aircraft type conversion, (see Method 1 below), based on the specifications in Table 1 and the pilot aircraft conversion syllabus in IOGP RP690-2, Section 45 - Pilot aircraft conversion syllabus and minimum hours;
    - The content of the training syllabus, including comprehensive ground and flight training, particularly for entry at the CPL stage (see Method 2 below), is based on regulatory training schemes;
    - There is a formal command progression scheme for pilots from ab initio to command, including Crew Resource Management (CRM) and simulator programmes including Line Oriented Flight Training (LOFT);
    - Training records demonstrate a structured command course, competencies to be achieved and the associated checking process;
    - There is a process for the selection, training, and designation of Line Training Captains (LTC); and
    - Base and Line training staff have defined competencies and these staff themselves are regularly checked.

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4. **Method 1** - Ab-Initio Entry Competency Based-Programme a pilot commences the programme at Table 1 – Stage 1 and follows all the stages defined:Stage

| | Subject | Content |
|---|---|---|
| 1 Ab-Inito Entry | Detailed pilot aptitude testing required prior to enrolment in the programme | Testing includes evaluation of language skills, cognitive abilities, hand-eye coordination, ability to apply theory and team coordination, etc. |
| 2 | CPL(H) training at approved Fight Training Organisation (FTO) (See Note 1) | ATP's theory required for operations on multi-pilot helicopters |
| 3 | IR(H) training at approved FTO | Instrument Rating (IR) Helicopters (H) Course completed successfully |
| 4 CPL Entry | CPL(H)/IR(H) | Individual may pass the entry process for operator *ab initio* programme with CPL or can enter programme with CPL as result of structured recruitment process |
| 5 | Operator training programme | • Multi Pilot Type Rating Course<br>• Multi Crew Co-operation Course (See Note 3)<br>• Type IR Course<br>• Operator Conversion Course - A/C and FS<br>• Flight tests by different Training Rating Examiner (TRE)<br>• Combined VMC Licence Skill Test and Operational Proficieny Check (OPC)<br>• Type IR Skill Test |
| 6 | Non-revenue offshore deck landing training by day and night with TRE | • Wet Dinghy Drill (WDD) and Helicopter Underwater Escape Training (HUET) Training<br>• Minimum 5 day and/or 5-night deck landings<br>• Competence check for release to Line Training<br>• Minimum 5 flight hours |
| 7 | Line Training Ground Course | • GPS/Navigation training<br>• Performance<br>• Flight Planning<br>• Dangerous Goods training<br>Simulator line flight or jump seat line<br>• familiarisation. |

Table notes

1. The State approved flight training school(s) and curriculum are to EASA/FAA or equivalent standards.
2. For details on the Multi Crew Co-operation Courses refer to EASA approved flight training establishments.
3. The programme meets FAA and/or EASA standards.
4. Detailed training records are maintained for all phases of the training programme.
5. These records reflect the results of each training session and include the standards to which the pilot was able to complete the exercise or flight requirement.

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| | | |
|---|---|---|
| 8 | Line flying under supervision of a LTC | Minimum 10 offshore landings by day and night.<br>Progress report required for all flights. |
| 9 | Line check as co-pilot by different LTC | For helicopter offshore operations, Includes an offshore landing and take-off as PF |
| 10 | Released to line | Ab initio pilots and CPL(H) holders with less than 1000 hours – with any commander who has no less than 500 hours Pilot in Command (PIC) time including 100 hours on type, Day only unless fully night qualified. |
| 11 | Progressive monitoring online as First Officer (FO) | 2 qualifying flight reports per month with a Training Captain or LTC. Recurrent training and OPC/Line Proficiency Check (LPC) checks<br>• Six-monthly progress reviews with training staff<br>• Written records of above elements<br>Can be released to any PIC when has 500<br>• hours |
| 12 | Promotion to Senior FO | Approximately at the 2-year point – promotion board or management evaluation with CP, Chief Training Captain (CTC) Senior LTC. Monitoring continues as above. |
| 13 | Command Course (at approximately the four-year point) | Minimum requirements – ATPL(H), helicopter. May be time as PICUS gained in accordance with the Operator's procedures and/or an NAA approved programme.<br>• Technical exam<br>• Right-hand Seat (RHS) checks<br>Flight Simulator Training Device (FTSD)<br>• Training and Assessment<br>• CRM assessment<br>• Command Line Training<br>• Command Line Check by different LTC |
| 14 | Promotion to Command | Initially only qualified to fly in command with co-pilots who have 500 hours total experience including 100 hours on type until the new commander has accumulated 500 hours in command. |

Table notes

1. The State approved flight training school(s) and curriculum are to EASA/FAA or equivalent standards.
2. For details on the Multi Crew Co-operation Courses refer to EASA approved flight training establishments.
3. The programme meets FAA and/or EASA standards.
4. Detailed training records are maintained for all phases of the training programme.
5. These records reflect the results of each training session and include the standards to which the pilot was able to complete the exercise or flight requirement.

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5. **Method 2** - Commercial Pilot Licence (CPL) Entry Competency-Based Programme, which is designed for pilots that hold a CPL, but are still to attain the flying hours specified in Table 2. Pilots enter the programme at Table 1 — Stage 4. The following requirements apply:
    - When a candidate is selected to enter with a CPL the following conditions apply:
    - Individual aptitude testing is completed in accordance with Table 1 - Stage 1
    - The candidate holds an ATPL theory qualification; and,
    - Full training records are held for the CPL training including records of stage and final check flights, and total hours are validated by the training provider.
6. **Method 3** - Experienced Flight Crew – Alternative requirements, which is required if the training programme does not support the **Method 1** Ab-Initio Entry or **Method 2** CPL- Entry programmes above, the qualification and experience levels in Tables 2 and 3 apply:
    - *Table 2 - Helicopter pilot qualification and experience levels*

| Qualifications and experience | FAR / CS 29 | FAR / CS 27 |
|---|---|---|
| Pilot in Command (PIC) | | |
| License | ATPL(H) | ATPL(H) |
| Instrument rating (see Table 2) | Current | Current |
| Total hours helicopter (1,2,4) | 3,000 | 2,000 |
| Total hours in command (1,3) | 1,500 | 1,000 |
| Total hours in command Multi-Engined (1, 3) | 1,200 | 500 |
| Total hours in similar aircraft complexity | 500 | 500 |
| Total hours in command on contract type | 100 | 100 |
| Co-Pilot | | |
| License | CPL(H) | CPL(H) |
| Instrument rating (see Table 1.6.2) | Current | Current |
| Total hours | 500 | 500 |
| Total hours Multi Engined (1,3) | 500 | 250 |
| Total hours in command (1) | 100 | 100 |
| Total hours on contract type (1) | 50 | 50 |

Table 2 Notes:

1. These hours to be fully on helicopters. Up to 10% may be achieved in a flight simulator approved for the purpose by the regulatory authority.
2. These hours include a minimum of 25 hours of night offshore time.
3. For Pilot In Command Under Supervision PICUS requirements see 7, below; Co-pilots who do not meet 100-hour captain experience may be used provided that each co-pilot has successfully completed the following training which is documented in the pilot's training records:
    - An approved type rating course for the aircraft type
    - A technical, emergencies and CRM course or Operator Proficiency Check at the appropriate type-specific flight simulator prior to commencing operational flying
    - 50 hours of operational line flying with an approved Training Captain
    - A successful Line Check flight by a different Check and Training Captain
4. Total hours may be reduced by 1000 hrs when total hours in aircraft of similar complexity exceeds 1000 hrs and no dispensation has been granted for the other Commander qualification requirements.

- *Table 3 - Aircraft Commander and Co-pilot qualification*

| Qualification | Experience |
|---|---|
| Total hours previous 90 days (See note 1) | 50 hours of which at least 10 on type |
| Medical certificate appropriate for license | Current |
| Instrument rating | Current; OPC at 6-monthly intervals |
| Night offshore recency previous 90 days | 3 cycles (See notes 2 & 3) |
| CRM or ADM, initial/refresher | Annual |
| Dangerous Goods awareness | Every 2 years or in accordance with local regulatory requirements |
| Offshore experience | One year |
| Helicopter Underwater Escape Training (HUET) | Every 4 years |

Table 3 Notes:

1. If hours are not met, a line check (which maybe a normal revenue flight) is conducted by a Line Training Captain.
2. One-night cycle consists of a night take-off, approach and landing to an offshore location. A simulator of the same type or series being flown may be used to meet the night recency requirements, provided this is acceptable under national legislation, and it has the visual fidelity to replicate landing on an offshore facility.
3. Use of the simulator for night deck recency cannot be used for 2 consecutive 90-day periods, as a minimum simulator-based recency alternates with actual offshore recency activity

7. Allow co-pilots to log Pilot In Command Under Supervision (PICUS) time to meet the requirements of command time in Tables 1 and 2:
    - In countries where the regulator allows for logging PICUS hours, the operator uses the approved national programme; and,
    - Time logged as PICUS meets the requirements of Table 1 and 2 above, provided:
        - The operator has control and supervision over the programme
        - The flight time is recorded in the pilot's training records;
8. Provide initial offshore training for offshore helicopter pilots, both day and night that includes operations to/from offshore helidecks, including takeoffs and landings as pilot flying and pilot monitoring.
9. Require operators to have a specific training program or specific previous experience for Pilots flying to offshore moving helidecks (vessels, semi-submersibles, etc.) based on a written training syllabus that includes flights to small and medium size vessels while underway and covers:
    - Differences in the location of the helideck (bow/stern/midships) and the effect this has on helideck movement; and,
    - Differences in approach/departure procedures for vessels under way and the effect this has on relative wind and turbulence at the various helideck positions.

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## GUIDANCE

1. No further guidance;
2. For any Single Engined or types requiring a Flight Engineer etc. the following should apply:

- 

| | | FAR-27 / CS-27 certified single-engine |
|---|---|---|
| **PILOT-IN-COMMAND (PIC)** | | |
| **QUALIFICATIONS** | Licences | CPL(H) |
| | Type rating on contract aircraft | Current |
| | Instrument rating on contract aircraft (1) | Current (2) |
| **EXPERIENCE**<br>**Not less than** | Total hours | 1,500 |
| | Total hours PIC (3) | 1,000 |
| | Total hours PIC - multi-engine (3) | |
| | Total hours PIC on contract type | 100 |
| **COPILOT** | | |
| **QUALIFICATIONS** | Licences | CPL(H) |
| | Instrument rating on contract aircraft (1) | Current (2) |
| | Type rating on contract aircraft | Current |
| **EXPERIENCE**<br>**Not less than** | Total hours | 500 |
| | Total hours on multi-engine aircraft (3) | |
| | Total hours PIC (3) | 100 |
| | Total hours on contract type (3) | 50 |

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| | | | | |
|---|---|---|---|---|
| **FLIGHT ENGINEER** | | | | |
| | Licence | 2nd Class | | |
| | Total flight hours | 2,000 | | |
| **NAVIGATOR** | | | | |
| | Licence | 1st Class | | |
| | Total flight hours | 2,000 | | |
| | Minimum navigator hours | 1,000 | | |

3. The programme being offered meets FAA, EASA or an equivalent level of a regulatory requirements, at the highest level of flight training.
4. No further guidance.
5. No further guidance.
6. The 90-day night helideck recency period in Table 3 may be extended to 120 days if the Pilot undertakes line flying under the supervision of a type rating instructor or examiner; and
    - The Full Flight Simulator (FFS) has sufficient fidelity and a visual package that allows for effective training on helideck landings.and the operator provides differences training to crews to account for differences in cockpit layouts, controls, navigation systems and different software versions. Refer to Shell Technical Authority TA-1.
    - For details of Alternative Means of Compliance for the 50 hours in 90 days requirement, see **FOR 05.02** Flight Crew – Proficiency Training.
7. No further guidance.
8. Initial training should also include:
    - Normal, abnormal and emergency procedures, Crew resource management, water entry and sea survival training;
    - Go-around by sole reference to instruments, prior to Landing Decision Point (LDP);
    - Transition, by sole reference to instruments, from Take-off Decision Point (TDP) into forward flight; and,
    - Recovery from attitudes resulting from unintentional loss of airspeed.
9. No further guidance.

## REFERENCES

- EASA SPA.HOFO.170.

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

8, 10, 12, 16.

## IOGP REPORT REFERENCE

- IOGP OHRP 690, Section 11 Flight Crew — Experience and Qualification.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 04.04 Pilots Flying More Than One Aircraft Type

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-4:**

1. Document a policy for pilots to operate only one type of aircraft in the same duty period, which applies across is operations, and which complies with National Aviation Authority (NAA) requirements.
2. Include in policy the requirement for the pilot to maintain recency and proficiency on those types on which they are permitted to fly Commercial Air Transport (CAT).
3. Closely monitor recency and proficiency on multiple types and document a requirement for pilots operating two aircraft types to have flown each type within the current 28-day period.
4. Normally only schedule pilots to fly only one type in any one day or block of days and limit flying a maximum of two types or significantly different variants in any one day, except for training captains when conducting training flights.

### GUIDANCE

1. Type is defined as either:
    - An entry on the pilot's licence that allows them to act as pilot on the type of aircraft specified in the rating; or,
    - A specific manufacturer's type or variant, in those countries where some aircraft types are not required to be specified on the pilot's licence.
2. No further guidance.
3. No further guidance.
4. No further guidance.

### REFERENCES

### RELATED INCIDENT

### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

### IOGP REPORT REFERENCE

- IOGP 690 OHRP, 690-2, 15. Pilots flying more than one aircraft type.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 04.05 Flight Crew Composition – Fixed Wing

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-3:**

1. Conduct flights with a minimum of two pilots, except in defined situations.
2. The defined situations where single-pilot flights can be considered for approval are if the flight is conducted under Visual Flight Rules (VFR) in an aeroplane certified for single-pilot operations.
3. Risks are formally assessed to As Low As Reasonably Practicable (ALARP), documented and accepted by the Shell Technical Authority - Air Transport (TA1).

### GUIDANCE

1. All crewing should meet minimum Original Equipment Manufacturer (OEM) and National Aviation Authority (NAA) certified crew composition.
2. Obtain initial approval from the Shell Technical Authority — Air Transport (TA1) for all single-pilot flights.
3. The risks that have been considered should include:
    - The potential for weather conditions to deteriorate below VFR minima;
    - Excessive pilot workload, including multiple-sector, high-frequency or long-duration operations; and
    - The suitability of the air traffic environment for single pilot operations;
    - Level of automation and equipment fit of aircraft;
    - Aircraft tasking.

### REFERENCES

### RELATED INCIDENT

### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

### IOGP REPORT REFERENCE

- R590 does not specify propeller-driven aircraft less that 5700kg as a requirement for two-pilot operations. Not covered in 690.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 04.06 Flight Crew Composition – Helicopters

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-4:**

1. Conduct all flights with a minimum of two Pilots for all Instrument Flight Rules (IFR), night operations.
2. Approve single-pilot operations in defined situations; they may be approved are when operating a helicopter of less than 5700kg (12500lbs) Maximum Certified Take-off Mass (MCTOM), with a maximum approved passenger seating configuration of less than nine seats, in a non-hostile environment.
3. Document Flight Crew procedures and Standard Operating Procedures (SOP) for any single pilots operations.

### GUIDANCE

1. No further guidance.
2. Obtain approval from the Shell Technical Authority – Air Transport (TA1) for all single-Pilot flights, the risk should be formally assessed to As Low As Reasonably Practical (ALARP), documented and accepted by the TA1. The risks that are to be considered include:
    - The potential for weather conditions to deteriorate below VFR minima;
    - Excessive pilot workload, including multiple-sector, high-frequency or long-duration operations; and
    - The suitability of the air traffic environment for single pilot operations.
3. See also **FOR 01.03** – Flight Crew Responsibilities

### REFERENCES

### RELATED INCIDENT

### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

8, 15.

### IOGP REPORT REFERENCE

- Not listed in 690

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## FOR.5 FLIGHT CREW TRAINING

### FOR 05.01 Flight Crew – General Training

**MANDATORY REQUIREMENTS**

**The Aircraft Operator is Accountable for Requirements 1-7:**

1. Document in a Training Manual or similar, a comprehensive training syllabus, in addition to or in lieu of National Aviation Authority (NAA) requirements, including details of training programmes and the required frequency, such that flight crew are competent to fulfil their duties.
2. Require that all pilots receive annual recurrent training to the standards of the NAA, and flight checks every six months. These flight checks include an annual instrument rating proficiency check/renewal (where applicable), a six-monthly Operational Proficiency Check (OPC) which includes emergency drills, and an annual Line Proficiency Check (LPC).
3. Relate training to seasonal changes, where distinct climatic seasons exist.
4. Prior to being scheduled for flight duties in a new location, all crewmembers undergo at least a documented orientation line check, including a review of local procedures and policies.
5. Prior to being scheduled for Maintenance Check Flights (MCF), crew receive training appropriate to the complexity of the aircraft and the level of the MCF required. This includes specific tasks and related human factors and crew coordination, and MCF are only are performed by competent and trained crew.
6. Require and verify that all Training personnel (1) (whether employed or subcontracted) are qualified to NAA requirements and use standard company procedures for their assigned tasks.
7. Maintain comprehensive training documentation including details of training programmes and the required training frequency.

[1]Training Captain, Instructor, Ground Instructor, Examiner, Line Check Airmen, etc.

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## GUIDANCE

1. Ground and flight training:
    - Ground and flight training programmes should include as a minimum:
        - Initial;
        - Recurrent;
        - Transition (conversion);
        - Re-qualification;
        - Upgrade to Pilot-in-Command (PIC);
        - Recent experience;
        - Familiarisation; and,
        - Differences or other specialised training.
    - Respective roles and operations should include Training for each flight seating location (e.g.): Helicopter co-pilots should have completed satisfactory right-hand seat training before acting as pilot in-command under supervision (PICUS) in the right-hand seat.
    - Training Manual and Syllabus should be updated to reflect current procedures and is available to all operational personnel, manual should include:
        - A process to support the introduction of new policies, rules, instructions and procedures
        - A process to introduce new aircraft types, systems fleet modifications and upgrades;
        - Student and instructor briefing packs; and,
        - A process to trend analyse training results to improve the programme
    - Training syllabus should include
        - Ground Training;
        - Simulator Training;
        - Aircraft Training;
        - Examination and certification;
        - Line Flying under supervision; and,
        - Integrated training for all persons assigned duties on-board an aircraft.
    - An analysis of training requirements should be conducted and documented, together with a training plan, for all aircrew members which typically covers:
        - Moving from one aircraft type to another;
        - Moving from Commercial Air Transport to SAR; and,
        - Moving onshore to offshore.
2. Checks to assure the competence of flight crew should include:
    - Annual Aircraft Technical and Operations Manual;
    - Annual Licence Proficiency Check (or NAA equivalent);
    - Annual Operator Proficiency Check (or NAA equivalent);
    - Annual Instrument Rating Check (or NAA equivalent);
    - Procedures flown under simulated or actual instrument conditions where the pilot under check has no visual reference outside the cockpit;
    - Annual Line Check (or NAA equivalent), carried out during a normal revenue flight to ensure continued operating standards are maintained;
    - NAA required Medical Check; and,
    - Annual Safety & Equipment Procedures (SEP) check.
3. MCF – see **ENG 03.08**.

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- No further guidance.

4. Training personnel - Aircraft:
    - A documented standardisation process.
    - Should be trained for the Aircraft type, familiar with the role and able to communicate in a common language with the students; and,
    - Where practicable checks are conducted by a person who has provided no more than 25% of required training, and is qualified to perform the check;
5. Standardisation in a form of briefing or session for all training personnel, in particular subcontractors, and including wet lease simulator instructors, should be held.
6. Training records should include the following:
    - Name and licence number of crewmember, date and type of check;
    - Aircraft or simulator used for the check;
    - The result of each check;
    - The results of the most recent written examination for each type the individual is qualified to fly; and
    - A master list of the certificates to be retained and copies of all certificates listed in the master list.

## REFERENCES

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP OHRP 690-2, 39. Flight crew training — Records and programmes, Flight crew training — Recurrent training and Maintenance Check Flights.

## FOR 05.02 Flight Crew – Proficiency Training

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-7:**

1. Provide additional Pilot training and assure competence on specific items required in lieu of, or in addition to, training required by the National Aviation Authority (NAA):
    - Within the training planning process a procedure is in place to ensure that each Pilot covers the full range of the major in-flight emergency procedures, for the type or types flown, over a set period not to exceed three years;
    - Night offshore recency previous 90 days — 3 Cycles
    - Airborne Collision Avoidance System (ACAS) training;
    - Terrain Avoidance and Warning System (TAWS) training;
    - The avoidance of Controlled Flight into Terrain (CFIT);
    - Adverse weather operations;
    - Use of the helideck Touch Down Position Marker (TDPM) for offshore operations;
    - Maintenance Check Flights (MCF);
    - High Altitude Indoctrination (HAI) training for crew of aircraft operating at cabin pressure altitudes above 10,000 feet Above Mean Sea Level (AMSL); and,
    - Training beyond stall for fixed-wing operations (where feasible).
2. Provide a minimum of five hours annual recurrent training per Pilot, per year, which includes:
    - Upset and abnormal/unusual attitude recovery training during either OPC or LPC;
    - Night flying competence (if there is a requirement for, whether on a routine or emergency only basis), to examine the pilot's proficiency in the handling of aircraft emergencies at night (checked in the FSTD);
    - For Visual Flight Rules (VFR)-only operations, an instrument check is conducted to ensure a minimum ability to maintain height, heading and airspeed, including during turning, tracking to and from a navigational aid, or maintaining a Global Positioning System (GPS) track, and upset and abnormal/unusual attitude recovery training and/or inadvertent flight into Instrument Meteorological Conditions (IMC);
    - For single-engine helicopters only – During annual training pilots of single-engine helicopters carry out one or more autorotations to the satisfaction of the training captain; and,
    - Ground Training through a written questionnaire covering all aspects of both operational and technical knowledge and/or an oral discussion based on the flight and operations manuals:
        - Aircraft Technical; and,
        - Contents of the Flight Operations Manual.
3. Implement a Crew Resource Management (CRM)/Threat and Error Management (TEM) training programme, with initial and annual refresher training, which can be carried out either as ground instruction or as part of proficiency training / checks.

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4. Require pilots to fly a 'reorientation' flight after an absence from flying for a period of 45 days or longer, to enable them to be refamiliarised with the operational environment. The flight may be conducted on a revenue flight with an instructor, line training captain, or an experienced line pilot approved by the base chief pilot monitoring the flight. For extended absences:

| Time of absence | Crew Requirement multi-crew | Crew Requirement single-pilot |
|---|---|---|
| 45 – 60 days | As above | As above |
| 60 – 90 days | One flight with a Training Captain<br>plus<br>One flight as Co-Pilot | Two flights with a Line Check Captain |
| 90 days or more | One flight with a Training Captain<br>plus<br>One flight as Co-Pilot<br>plus<br>One flight with Training Captain or a Line Check Captain | One flight with a Training Captain<br>plus<br>2 flights with a Line Check Captain |

5. Require pilots to fly a total Pilots fly a total of 50 hours in the preceding 90 days to maintain recency. Hours in a Flight Simulator Training Device (FTSD) may be included in this total. If the requirement is not met, a line check (or LPC/OPC) is carried out by an LTC (or TRE/TRI).
6. Develop a risk assessment with appropriate mitigation in cases where 90-day minimum requirements, in 5, cannot be met due to low contracted flight hours.
7. Where pilots operate more than one helicopter type, the pilot maintains recency and proficiency on those types they are scheduled to fly Commercial Air Transport (CAT).

## GUIDANCE

1. Additional training should include:
    - Major in-flight emergency procedures typically should cover:
        - Full Authority Digital Engine Control (FADEC) malfunctions;
        - Hydraulic systems: loss of fluid, leakage, pump failures, loss of system functionality
        - Electrical supply systems, loss of AC generation, DC generation, battery power and reversionary modes, loss of other systems;
        - Autopilot system failures, with particular emphasis on revisionary modes, partial system degradations, mixed mode flying and effects of overriding coupled modes;
        - Avionics and navigational system failures;
        - Control system failures (landing gear, decompression);
        - Mechanical system failures, including transmission failures;
        - Tail rotor control or drive failures; and,
        - Fuel system failures.
    - ACAS I, and/or ACAS II, training — See **FOR 01.08** ACAS;
    - TAWS training — See **FOR 01.09**;
    - MCF — see **ENG 03.08** and **FOR 05.01**;
    - Training for the avoidance of CFIT should follow NAA requirements, or use programmes such as the Flight Safety Foundation — CFIT-Reduction Products guidance;
    - Adverse weather operations conditions such as turbulence, windshear, operations in or near thunderstorms, operations in icing conditions, wake turbulence avoidance, surface contamination and any other weather conditions applicable to the type of operation and geographical operating area. For offshore operations, training on policies for excessive winds over helidecks, adverse sea conditions and the application of significant wave height policies — See **FOR 03.02**;
    - Training in the use of the Touch Down Position Markings (TDPM) and all other relevant markings for offshore helicopter operations – See **FOR 03.08**;
    - HAI training for crew of aircraft operating at cabin pressure altitudes above 10,000 feet Above Mean Sea Level (AMSL), should include at least the following:
        - Physiological phenomena in a low-pressure environment, including respiration, hypoxia, duration of consciousness at altitude without supplemental oxygen, gas expansion and gas bubble formation;
        - For pressurised aircraft, phenomena associated with rapid or explosive loss of pressurisation including most likely causes, noise, cabin temperature change; cabin fogging, effects on objects located near the point of fuselage failure, actions of flight crew members immediately following the event and the likely resultant mental attitude; and,
        - For non-pressurised aircraft, high altitude training in a chamber to identify hypoxia symptoms.
    - Training beyond stall for fixed-wing operations is where feasible.
2. No further guidance.
3. No further guidance.
4. Recent experience checks could be carried out in an Level C or Level D FFS (or type -specific Type III, IV or V devices as described in ICAO Doc 9625 Vol 2), during a Line Oriented Flight Training (LOFT) scenario, where the simulator is configured for the operating area For Co-Pilot duties, the Aircraft Operator should define appropriate checks for the time of absence.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

5. FTSD should be Level C or Level D Full Flight Simulator (FFS) (or type -specific Type III, IV or V devices as described in ICAO Doc 9625 Vol 2):
    - A line check (which may be a normal revenue flight) is conducted by a line training captain at least annually as part of the recurrent training program. It can also be used for other purposes, such as resetting currency after a time of absence; and,
    - See **FOR 04.03** – Flight Crew Qualification and Experience –Helicopters;
6. The risk assessment should be agreed and approved with the Shell Technical Authority — Air Transport (TA1).
7. See **FOR 04.04** — Pilots Flying More Than One Aircraft Type.

## REFERENCES

- EASA SPA.HOFO.170 Crew requirements;
- **https://flightsafety.org/toolkits-resources/past-safety-initiatives/controlled-flight-into-terrain-cfit/cfit-reduction-products/**

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- R590 does not address specific Shell expectations in Requirements.
- IOGP OHRP 690-2, 42. Flight crew training — 90-day recency.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 05.03 Flight Crew – Simulator Training

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirement 1-7:**

1. Conduct recurrent flight crew training in a suitable and National Aviation Authority (NAA) approved Flight Simulator Training (FSTD) at a frequency of at least once every six (6) months.
2. Seat flight crews at normal flight control stations to receive credit for simulator time.
3. Use FSTDs that include landing area visual simulations that are representative of those being used, including for example, helideck visuals with markings representative of those being used in daily operations.
4. Incorporate LOFT scenarios and Threat and Error Management (TEM) training into the FSTD training syllabi:
5. Train instructors for the FSTD, to ensure that, they are familiar with the role, able to communicate in a common language with the students, and can communicate effectively with the trainees.
6. Conduct a gap analysis where differences exist between aircraft/type or variant and training devices (e.g. equipment fit, software version) and apply suitable mitigations.
7. Maintain training records in a suitable system.

### GUIDANCE

1. Level C or Level D FFS (or type -specific Type III, IV or V devices as described in ICAO Doc 9625 Vol 2) are used where available for the type:
    - Where an FFS or ICAO 9625 equivalent is not available for the aircraft type or where the configuration of the FFS is not sufficiently representative of the contracted commercial aircraft, FTDs may be used in accordance with the following guidelines:
        - FTD Level 3 or equivalent for medium rotorcraft above 3175 kg (7,000 lb); and,
        - FTD Level 2 for small rotorcraft with a maximum weight of 3175 kg (7,000 lb) or less and certified with nine or less passenger seats.
    - Where no FSTD is available for the specific aircraft type, additional training should be undertaken on the actual aircraft variant following consultation with the Shell Technical Authority - Air Transport (TA/1) on appropriate content for the training syllabus;
    - Recurrent training in an FSTD should be conducted for each aircraft type flown and training should include emergency and abnormal procedures that cannot be practised in the air; and,
    - Exercises developed between the Aircraft Operator and FSTD training centre should provide adequately representative exercises that simulate role related mission, local operational, weather and environmental conditions.
2. Training for each flight seating location (e.g.): Helicopter co-pilots should have completed satisfactory right-hand seat training before acting as pilot in-command under supervision (PICUS) in the right-hand seat.
3. For all training devices, including FSTD:
    - Identified training devices should have sufficient fidelity and suitability for each training task;
    - Navigation, terrain and visual database should adequately represent the area of operation.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

4. No further guidance.
5. Where practicable checks are conducted by a person who has provided no more than 25% of required training, and is qualified to perform the check, and a training standardisation process and verify that training facilities, devices and course materials reflect the configuration of the aircraft for which the training is being provided should be documented.
6. Significant differences covering cockpit design and autopilots, minor equipment differences can be briefed during training and a training standardisation process should verify that training facilities, devices and course materials reflect the configuration of the aircraft for which the training is being provided.
7. Training records should include the following:
    - Name and licence number of crewmember, date and type of check;
    - The type of **FSTD** or aircraft used for the check; and,
    - The result of each check.

## REFERENCES

- ICAO Doc 9625, Manual of Criteria for the Qualification of Flight Simulation Training Devices, Vol 1 and 2.
- **UK CAA, CAP 720 - Flight Crew Training: Cockpit Resource Management (CRM) and Line-Oriented Flight Training (LOFT)**

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

8, 15.

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-2, 43. Use of Flight Simulation Training Devices — General, 44. Use of Flight Simulation Training Devices — Devices.
- R590 does not refer to the verification of training materials, FSTD configuration, or retaining records for 3 years.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 05.04 Flight Crew – Emergency and Safety Equipment Training

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-5:**

1. Provide a Helicopter Underwater Escape Training (HUET) course to helicopter crew members, that meets a recognised standard (e.g. OPITO) and includes the use of a Modular Egress Training Simulator (METS) intervals not exceeding 4 years.
2. Include in HUET training the use of the Compressed Air – Emergency Breathing Systems (CA-EBS), where used, to ensure user proficiency at least every four years, unless local regulation requires greater frequency.
3. Conduct initial Emergency and Safety Equipment (ESE) training during type conversion for all aircraft crew members that includes instruction on the location and operation of all emergency equipment, and at least every 2 years thereafter.
4. Conduct wet dinghy (life raft) drills at least every 4 years.
5. Maintain documented records of the training completed for all HUET trained personnel.

### GUIDANCE

1. The HUET trainer should meet the following minimum requirements:
    - In regions where only one type of helicopter is flown, the dimensions of the interior of the simulator should be representative of the interior of the cabin. Ideally the simulator should replicate the cabins of the commonly used offshore helicopter types;
    - The cabin and cockpit sections should be fitted with seats, harnesses, emergency exit types and sizes that are representative of the aircraft flown in offshore operations;
    - Operating mechanisms for jettisonable doors and windows are to replicate those fitted to the helicopter type and the force required to remove a push-out window is also to be representative of the type of push-out window used;
    - The roll rate of the simulator should be representative of the roll rate of the actual helicopter such that the trainee is introduced to the feeling of disorientation associated with being turned upside down during the in-rush of water; and,
    - Where possible the emergency egress lighting fitted to the helicopter emergency exits should also be fitted to the HUET simulator.
2. The CA-EBS should be compatible with the lifejacket (and immersion suit, if required), and an appropriate Maintenance Program (including pre-flight inspection) is in place for these items. HUET may also include training in the use of a “re-breather” self-breathing device.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

- ESE training should be aircraft type-specific and should include the following:
  - Fire in the air and on the ground, and here used, breathing apparatus (or smoke hood) training should be conducted on at least three yearly basis;
  - Some National Aviation Authorities (NAA) require this training to be completed annually;
  - Use of fire extinguishers;
  - Operation and use of emergency exit;
  - Passenger preparation for an emergency landing/ditching;
  - Emergency evacuation procedures;
  - Donning and inflation of life preservers (when equipped);
  - Removal from stowage, deployment, inflation and boarding of life rafts (when equipped);
  - Pilot incapacitation;
  - Unlawful interference, bomb threat and other security procedures;
  - Any special emergency procedures when the aircraft is used on Medical Evacuation (MEDEVAC) operations including patient evacuation in emergency situations and passenger health emergencies; and,
  - First Aid - can be satisfied by completion of a typical first aid in the work-place training programme as offered by the red-cross (or equivalent) or an approved OPITO training centre. As applicable, training should include Automated External Defibrillator (AED) training.

3. No further guidance.
4. No further guidance.

## REFERENCES

- UK CAA CAP 1145 – Safety review of offshore public transport helicopter operations in support of the exploitation of oil and gas.
- OPITO Training Standard - Helicopter Underwater Escape Training (HUET) with Compressed Air Emergency Breathing System (CA-EBS).
- AeroSpace and Defence Industries Association of Europe — Standardization (ASD-STAN) document EN4856:2018.
- European Technical Service Order (ETSO) 2C519.

## RELATED INCIDENT

AS332L2, Sumburgh, UK, 2013.

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

1, 3, 4, 6, 7, 8, 12, 13, 15, 16.

## IOGP REPORT Reference

- IOGP OHRP 690-2, 47. Role specific training – Helicopter Underwater Escape Training (HUET), and 48. Role specific training – Emergency Breathing Systems (EBS).

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 05.05 Technical/Cabin Crew Members – General Training

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-7:**

1. Document and provide National Aviation Authority (NAA) approved ground and flight training so that all Technical/Cabin Crew (whether employed or subcontracted) are trained to act as Technical/Cabin Crew on a specific aircraft type and/or in specific roles and operations.
2. Document and provide NAA approved checks to assure the competence of all cabin crew (whether employed or subcontracted) to operate on a specific aircraft type and/or in specific roles and operations.
3. Complete an approved Human Factors/Crew Resource Management (CRM) training programme at least every two years.
4. Require and verify that all Training personnel (whether employed or subcontracted) are qualified to NAA requirements and use standard company procedures for their assigned tasks.
5. Maintain records of all training and retain records for 3 years, including training carried out by third parties.
6. Maintain a documented training process which is updated to reflect current procedures, is available to all operational personnel process and is approved by the NAA (if applicable), to include training syllabi and checking programmes.
7. Require and verify that training facilities, devices and course materials reflect the configuration of the aircraft for which the respective training is being provided.

### GUIDANCE

1. Ground and Flight Training programmes should include as a minimum:
    - Initial;
    - Recurrent;
    - Transition (conversion);
    - Re-qualification;
    - Recent experience; and,
    - Differences or other specialised training.
2. Checks to assure the competence of Technical/Cabin Crew should include as a minimum:
    - Annual Line Check (or NAA equivalent);
    - Annual Medical Check; and,
    - Annual Safety & Equipment Procedures (SEP) check;
3. Training personnel should be:
    - Trained for the device, familiar with the role and able to communicate in a common language with the students; and,
    - Have a documented standardisation process.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

4. .Training records should include the following:
    - Name and licence number (if applicable) of crewmember, date and type of check;
    - The Training Device, or aircraft used for the check;
    - The result of each check; and,
    - A master list of the certificates to be retained and copies of all certificates listed in the master list.
    - Training Manual and Syllabus:
5. The Training manual should include:
    - A process to support the introduction of new policies, rules, instructions and procedures;
    - A process to introduce new aircraft types, systems fleet modifications and upgrades; and
    - A process to trend analyse training results to improve the programme.
6. Training syllabus should include:
    - Ground Training;
    - Aircraft Training; and,
    - Examination and certification.
7. When using Training devices for Technical/Cabin Crew:
    - Where differences exist between the aircraft and training devices (e.g. equipment fit, software version), a gap analysis and mitigation processes are maintained; and,
    - A list of recorded defects for the training device should be maintained.

## REFERENCES

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- Not listed in 590/690.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 05.06 Technical and Cabin Crew – Proficiency and Emergency Training

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-5:**

1. Provide additional training and assure competence on the following areas, in addition to any training required by the National Aviation Authority (NAA):
    - Crew Resource Management (CRM) / Aeronautical Decision Making (ADM) using specially trained facilitators during initial and recurrent training (FOR 05.04 refers);
    - The recognition of Dangerous Goods (DG) and,
    - Emergency and safety equipment checks to cover evacuation drills and knowledge of safety equipment.
2. Provide training in abnormal procedures, to include coordination among crew members, and drills in the emergency evacuation from the aircraft.
3. Conduct initial Emergency and Safety Equipment (ESE) training during type conversion for all aircraft crew members that includes instruction on the location and operation of all emergency equipment, and at least every 2 years thereafter.
4. Conduct initial dry dinghy (life raft) drills during type conversion for over-water operations and annually thereafter.
5. Conduct wet dinghy (life raft) drills at least every 4 years.

### GUIDANCE

1. No further guidance.
2. ESE training is aircraft type-specific (where practicable) and should include:
    - Fire in the air and on the ground;
    - Use of fire extinguishers;
    - Operation and use of emergency exits;
    - Passenger preparation for an emergency landing/ditching;
    - Emergency evacuation procedures;
    - Donning and inflation of life preservers (when equipped);
    - Removal from stowage, deployment, inflation and boarding of life rafts (when equipped);
    - Pilot incapacitation;
    - Unlawful interference, bomb threat and other security procedures;
    - Any special emergency procedures when the aircraft is used on Medical Evacuation (MEDEVAC) operations including patient evacuation in emergency situations and passenger health emergencies; and,
    - First Aid.
3. No further guidance.
4. No further guidance.
5. Liferaft training could be carried out as part of HUET Training.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## REFERENCES

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- Not covered in 690.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 05.07 Line Operations Safety Audit

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-4:**

1. Establish and document a structured Line Operations Safety Audit (LOSA) programme is conducted periodically and a full observation cycle is conducted at a minimum every three years;
    - Observation flights use specially trained observers;
    - Observation flights are conducted on normal, routine, flights; and,
    - A representative sample of company flights is carried out.
2. The data from the LOSA programme is analysed appropriate action plans are implemented.
3. FDM and LOSA observations are analysed collectively for added insight.
4. Implementation of a LOSA programme is agreed with the Shell Technical Authority - Air Transport (TA/1).

### GUIDANCE

1. The TA/1 should secure seating capacity for a specific period for the observer to successfully complete the required LOSA flights:
    - Preference is that the LOSA program is shared at a base over multiple customers if possible;
    - Operators should liaise on conducting LOSA flights in aircraft not equipped with jump seats and observers should be considered part of the flight crew;
    - The LOSA programme complies with ICAO Doc 9803.
2. All LOSA programmes should be based upon an anonymous, confidential and non-punitive approach, as highlighted in the ICAO and FAA Guidance and an appropriate feedback process to pilots is in place.
3. Typically, LOSA will not be expected for short term, ad-hoc contracts.
4. No further guidance.

### REFERENCES

- The LOSA collaborative provides many operators with LOSA services:**https://www.losacollaborative.com/**
- The ICAO LOSA Manual Doc 9803, provides details on setting up a programme.
- FAA has also issued guidance on LOSA, Advisory Circular, AC120-90.

### RELATED INCIDENT

### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-1, 14. Line Operations Safety Audit.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 05.08 New aircraft conversion syllabus and minimum hours

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-6:**

1. Establish and document a structured type conversion syllabus for the introduction of new aircraft types.
2. Document the requirement for captains have at least 100 hours on type and co-pilots have at least 50 hours on type.
3. Provided the crews have followed an integrated structured training programme for the initial type rating.When new types are introduced into service, or when changing to alternate types, operations are permitted with fewer hours.
4. Develop a programme that is approved by the National Aviation Authority (NAA) and is run either by the aircraft Original Equipment Manufacturer (OEM) or by an approved and licenced Air Training Organisation (ATO).
5. Includes time spent in a Flight Simulator Training Device (FSTD) as part of the structured programme.
6. Agree the hours to be achieved during type conversion or an initial type rating (including any initial conversion training), in advance, with the Shell Technical Authority - Air Transport (TA/1).

### GUIDANCE

1. No further guidance.
2. No further guidance.
3. No further guidance.
4. No further guidance.
5. A simulator is to be available for any new type entering service, that has been assessed as acceptable by Shell Aircraft – see Advisory Procedures Manual for more details.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

6. The table below gives indicative hours for conversions from other helicopter types and is based on IOGP R590C, 1.5.6, and Appendix 12C of the withdrawn SGARO Part 1. The hours suggested herein are not intended to exactly total the requirement, but to leave an element of latitude for the Training Captain to allocate to actual needs of the individual. This table is a sample that might be used for helicopters; it can be modified as needed for aeroplanes and varying models/types of aircraft.

| | Pilot Conversion Experience with Example Models | TRE/TRI | Captain and Line Training Captain | Co-pilot | Remarks |
|---|---|---|---|---|---|
| 1 | Non Series/derivative analogue type aircraft converting to glass cockpit, or glass cockpit to analogue (i.e. Bell 212 analogue cockpit to an EC225 with full glass cockpit) | 80 | 60 | 60 | Includes the total hours accrued in achieving the type rating. |
| 2 | Series/derivative analogue type aircraft converting to glass cockpit, or glass cockpit to analogue (i.e. AS332L1 to an EC225, or SK 76A++ to an SK-76C++) | 30 | 20 | 10 | Assuming greater than 150 on the original type. Co-pilot should fly with experienced line training captain with 500 hours on type or derivative type otherwise requires 15 hours. |
| 3 | Non-series/derivative type with glass cockpit converting to another glass cockpit (i.e. S76C+ to S92A) | 70 | 50 | 35 | May include change in class of aircraft, e.g. small to large. Variant glass cockpits within a series should require a differences/familiarization training course. |
| 4 | Non series/derivative analogue type single engine aircraft converting to multi engine glass cockpit aircraft with MTOGW of less than 7000 lb, (i.e. Bell 206 analogue cockpit to an EC135 glass cockpit) or to SIC in a multi engine glass cockpit aircraft (i.e. Captain in Bell 206 to SIC in SK- 76C++ or AW 139) | 80 | 50 | 50 | Assumes pilot has no previous multi-engine aircraft experience. Reductions in flight under supervision times may be made commensurate with previous multi engine aircraft time. |

## REFERENCES

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 590-C: Personnel qualifications, experience and training, section 1.5.6 Pilot aircraft conversion syllabus and minimum hours. IOGP R690 OHRP 690-2, Section 45. Pilot aircraft conversion syllabus and minimum hours.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR.6 MEDICAL AND FATIGUE

### FOR 06.01 Medical and Pilots Maximum Age

#### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-5:**

1. Prohibit the use of pilots on commercial air transport operations who have reached 65 years of age.
2. Allow pilots that have attained the age of 60 years, or have an operational multi-pilot limitation on their medical certificate, only to operate an aircraft with another pilot provided, when the other pilot is fully-qualified and not also subject to an operational multi-pilot limitation; and the other pilot has not attained the age of 60 years.
3. Require that all pilots flying for the Company hold a valid pilots medical certificate, in addition to, or in lieu of, National Aviation Authority (NAA) requirements and when over the age of 60, medicals include an electrocardiography at intervals not exceeding six months.
4. Require that other flight crew actively engaged in flying duties are subject to periodic medical examinations appropriate to their duties.

#### GUIDANCE

1. International Civil Aviation Organisation (ICAO) Annex 1, section 2.1.10 , which states age limitations.
2. Further information on operational multi-pilot limitations are contained in EASA AMC1 ORO.FC.100(c).
3. No further guidance.
4. ICAO Annex 1, section 1.2.5.2.1 states that once an Airline Transport Pilot License (ATPL) (A or H) holder passes the age of 60, they must sit six-monthly medical examinations.

#### REFERENCES

#### RELATED INCIDENT

#### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

8.

#### IOGP REPORT REFERENCE

- No reference in IOGP OHRP 690.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 06.02 Flying Hour Limits – Fixed Wing

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirement 1-4:**

1. Document the maximum flying hours limit and the process to record, track and prevent exceedance.
2. The following limits and controls are available to all flight Crew Members and personnel concerned with the preparation and day-to-day management of flight crew schedules and rosters:
    - 900 hours maximum per year;
    - 100 hours maximum per 28 days;
    - 42 hours maximum per 7 days;
    - 8 hours maximum for single pilot operations per 24-hour period; and,
    - 10 hours maximum for two pilot operations per 24-hour period.
3. Flying hours are calculated on a rolling cumulative basis, based on consecutive days so that a rolling cumulative total may be established at any time.
4. A daily record is maintained of each Pilot's flying hours showing the cumulative totals for the past periods of 24 hours, 7 days, 28 days and per year.

### GUIDANCE

1. No further guidance.
2. Alternative flying hour limits may only be used with the agreement of the Technical Authority - Air Transport (TA/1).
3. No further guidance.
4. No further guidance.

### REFERENCES

### RELATED INCIDENT

### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

8.

### IOGP REPORT REFERENCE

- R590 is less strict than those listed in this AOR.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 06.03 Flying Duty Periods – Fixed Wing

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirement 1-3:**

1. Document the maximum Flying Duty Period (FDP) and the process to record, track and prevent exceedance to ensure that Flight Crew are not exposed to cumulative fatigue.
2. Documented Limits and controls are available to all Flight Crew members and personnel concerned with the preparation and day-to-day management of Flight Crew schedules and duty rosters.
3. Allow the maximum FDP to be 14 hours, this is reduced for early morning or evening starts and to 11 hours for single-Pilot operations and notwithstanding this, the cumulative FDP limits are as follows:

| Crew | 7 Days | 14 Days | 28 Days |
|---|---|---|---|
| Pilots | 84 hrs | 132 hrs | 210 hrs |
| Cabin Attendant (A) | 84 hrs | 132 hrs | 210 hrs |

- Maintain a daily record for each Flight Crew member's FDP showing the cumulative totals for the past periods of 7 days, 14 days and 28 days;
- Include all flying done by a Flight Crew member regardless of where and for whom the flying was conducted in the FDP;
- Include time spent on administrative duties and on travel to a work site (i.e. repositioning or 'deadheading')in the FDP;
- Apply minimum Rest periods of 12 hours and provide at least 10 hours of effective rest by limiting commuting travel to two hours;
- Flight Crew do not work more than seven consecutive days between days off and shall normally have not less than two consecutive days off in 14;
- Flight Crew have on average at least eight days off in each consecutive five-week period averaged over three such periods;
- When Pilots nominated for night standby duty are not used for such and achieve the minimum daily rest period overnight, they may be considered available for duty on the following day period. Otherwise, they are given 12 hours rest before recommencing duty. Pilots are not rostered for a night duty following a day duty; and,
- For split duties with a rest period within an FDP the following table indicates the maximum permitted FDP extension.
-

| Rest period | Permitted extension |
|---|---|
| Less than 2 hours | No extension is permitted |
| 2 – 3 hours | 1 hour |
| 3 - 10 hours | 50% of the consecutive hours rest not including the time for post and pre-flight duties |
| > 6 hours | Suitable accommodation is provided |

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

4. When an extension to the FDP is necessary, the air operator will have implemented a Fatigue Risk Management System (FRMS), or an alternative National Aviation Authority (NAA) approved process.

## GUIDANCE

1. No further guidance.
2. No further guidance.
3. Flight Crew working a customised work schedule (14 days on/14 days off etc.) have a fatigue risk management plan approved by the National Aviation Authority (NAA), which may allow deviation from the days off requirements. These alternative arrangements may be used with the agreement of the Technical Authority - Air Transport (TA1),
4. No further guidance.

## REFERENCES

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

8.

## IOGP REPORT REFERENCE

- R590 implies recording FDP but does not state this as a requirement. R590 does not reduce duty hours from 14 to 12 for early morning or evening starts. R590 does not specify maximum duty hours for 7, 14, or 28 days. Not included in OHRP 690.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 06.04 Flying Hours Limits – Helicopters

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirement 1-6:**

1. Document the maximum flying hours limit and the process to record, track and prevent exceedance.
2. Document the following limits and controls and make them available to all flight crew members and personnel concerned with the preparation and day-to-day management of flight crew schedules and rosters:
    - Limits;
    - 900 hours maximum per year;
    - 240 hours maximum in any 3 consecutive 28-day period;
    - 90 hours maximum per 28 days;
    - 42 hours maximum per 7 days;
    - 7 hours maximum for single pilot operations per 24-hour period; and,
    - 8 hours maximum for two pilot operations per 24-hour period.
3. Flying hours are calculated on a rolling cumulative basis, based on consecutive days.
4. A daily record is maintained of each helicopter Pilot's flying hours showing the cumulative totals for the past periods of 24 hours, 7 days, 28 days, and per year.
5. For Pilots flying highly-demanding operations, the maximum permitted flying hours are to be reduced with the agreement of the Technical Authority – Air Transport (TA/1).
6. Alternative flying hour limits may only be used with the agreement of the Technical Authority – Air Transport (TA/1).

### ADDITIONAL GUIDANCE

1. No further guidance.
2. No further guidance.
3. No further guidance.
4. No further guidance.
5. Additional restrictions may be required for particularly demanding flights and examples of highly-demanding operations are:
    - High frequency of landings;
    - High ambient temperatures without effective aircraft air conditioning;
    - Shuttling operations at night or in Instrument Metrological Conditions (IMC);
    - Pilots wearing immersion suits for continuous flying more than 4½ hours have a 30-minute break; and,
    - Rotors running refuelling (RRRF) operations are not considered to be a break. The 30 minutes allowed for immediate post and pre-flight duties is not considered to be a break.
6. No further guidance.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## REFERENCES

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

8, 16.

## IOGP REPORT REFERENCE

- Not clearly defined in 690.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 06.05 Flying Duty Periods – Helicopters

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirement 1-11:**

1. Establish and document the Flying Duty Period (FDP) and the process to record, track and prevent exceedance to ensure that Flight Crew are not exposed to cumulative fatigue.
2. Limit the maximum daily FDP to 12 hours and this is documented.
3. Include administrative/office time, flight planning, flight preparation, flight time, post flight duties, completion of any associated maintenance or paperwork as part of the FDP.
4. Define when the duty day starts and ends and how the FDP is calculated.
5. Document that the minimum rest period is 10 hours effective rest, or the length of the preceding FDP, whichever is the greater.
6. When an extension to the FDP is necessary, the air operator will have implemented a Fatigue Risk Management System (FRMS), or an alternative National Aviation Authority (NAA) approved process.
7. Maintain a daily record for each Crew member's FDP showing the cumulative totals for the past periods of 7, 14 and 28 days not to exceed the below shown maximum FDP cumulative limits:

| Crew | 7 Days | 14 Days | 28 Days |
|---|---|---|---|
| Helicopter Pilot | 84 | - | 200 |
| Cabin Attendant (H) | 84 | 105 | 210 |

8. Document the following working time requirements:
    - Flight Crew do not work more than seven consecutive days between days off and have no less than two consecutive days off in 14; and,
    - Flight Crew have on average at least eight days off in each consecutive five-week period averaged over three such periods.
9. Prohibit Flight Crews on rotating assignments that arrive following prolonged or overnight travel, or travel exceeding four time zone changes, from being rostered for flying duties until a minimum ten-hour rest period is met.
10. Document the following night standby by requirements:
    - After a day duty period, each pilot has at least 12 hours rest prior to being rostered for night standby duty; and,
    - Pilots nominated for night standby duty (at their place of rest) who are not called out to fly, may be considered available for duty in the following day period. If the pilots are called out to fly during the night, they have a minimum of 12 hours rest after completion of their FDP.
11. Gain approval from NAA and Technical Authority – Air Transport (TA/1), if an FDP split duty program is required.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## GUIDANCE

1. Documented limits and controls should be made available to all Flight Crew members and personnel concerned with the preparation and day-to-day management of Flight Crew schedules and duty rosters.
2. No further guidance.
3. No further guidance.
4. No further guidance.
5. Minimum rest periods should account for commuting travel.
6. No further guidance.
7. Include all flying done by a Flight Crew member regardless of where and for whom the flying was done, and also include time spent on administrative duties and on travel to a work site (i.e. repositioning or 'deadheading') in the FDP.
8. No further guidance.
9. Flight Crew working a customised work schedule (14 days on/14 days off etc.) have a fatigue risk management plan approved by the NAA and with the agreement of the Technical Authority – Air Transport (TA/1).
10. No further guidance.
11. Permitted FDP extensions for split duties, with a rest period within an FDP, the following table indicates the maximum extensions allowed:

| **Rest period** | **Permitted extension** |
|---|---|
| Less than 2 hours | No extension is permitted |
| 2 – 3 hours | 1 hour |
| 3 – 10 hours | 50% of the consecutive hours rest<br><br>Not including the time for post and pre-flight duties |
| > 6 hours | Suitable accommodation is provided |

## REFERENCES

- ICAO Annex 6 Vol 3 Operation of Aircraft - International Operations - Helicopters.
- ICAO Doc 9966 – Fatigue Risk Management System.
- ICAO Fatigue Risk Management System (FRMS) Implementation guide for operators.

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

8.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-2, 17: Flight crew fatigue management - Flight time limits, 18. Flight crew fatigue management -- Rest for rotating crews, 19. Flight crew fatigue management -- Night standby duty.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR.7 AIRCRAFT AND EQUIPMENT

### FOR 07.01 Equipment Specifications – Aeroplanes

**MANDATORY REQUIREMENTS**

**The Aircraft Operator is Accountable for Requirements 1-31:**

1. Use only aeroplane types that have been assessed as acceptable by Shell Aircraft and are agreed with the relevant Shell Technical Authority - Air Transport (TA/1).
2. Fit the following additional equipment, specified below, items 3-30, for aeroplane contracts, where required; exceptions are made in contracts for less than 200 flight hours per annum and ad-hoc contracts, and are agreed with the relevant Shell Technical Authority — Air Transport (TA/1).
3. Transponder and Mode S — Mode C is acceptable for non-Airborne Collision Avoidance System (ACAS) II equipped aircraft.
4. Automatic Dependent Surveillance (ADS)-B compatible equipment is fitted when ADS-B available in the operating area.
5. Satellite Flight Following System (SFFS);
    - If ADS-B or ATC radar coverage is not available in the full operating area, Satellite Flight Following System is installed.
6. Terrain Awareness Warning System (TAWS);
    - Operators have a process to ensure that the database for terrain awareness warning systems with predictive terrain hazard warning is kept current; and,
    - The TAWS provide, as a minimum, warnings of at least the following circumstances:
        - Excessive descent rate;
        - Excessive altitude loss after take-off or go-around; and
        - Unsafe terrain clearance.
7. ACAS I, as a minimum;
    - ACAS II when available for aircraft type, and agreed by Shell Technical Authority - Air Transport (TA/1) and Operator; and,
    - ACAS II fitment may be exempt by risk assessment for low traffic areas.
8. CVR (Cockpit Voice Recorder) and FDR (Flight Data Recorder) or a Combined Cockpit Voice and Flight Data Recorder (CVFDR); — Note — Operations are permitted without CVR/FDR on aircraft certificated with a seating capacity of 10 seats or less.
9. Underwater Locator Beacon (ULB), which has minimum 90-day battery life and is compliant with ETSO C121b or later approved version and is attached to the CVR and FDR, or combined CVFDR (if fitted).
10. Emergency Locator Transmitter (ELT), meeting as a minimum Technical Standard Order (TSO) C126.
11. Flight Data Monitoring (FDM) – equipment to facilitate download is fitted.
12. Pitot heater failure indication warning.
13. For operations above 10,000 ft. Crew oxygen is carried.
14. Passenger therapeutic oxygen is also carried.
15. Automated External Defibrillator (AED).

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16. A passenger safety belt for each, having a metal-to-metal latching device.
17. A shoulder harness on the forward side for each flight deck seat and cabin crew member seat.
18. Any side-facing seats are fitted with shoulder harness.
19. Passenger briefing cards which include the location of first aid equipment, fire extinguishers and brace position.
20. Aircraft documentation, as required by operator and National Aviation Authority (NAA).
21. Manuals appropriate to the area and type of operation.
22. Insurance Certificate
23. First Aid kit.
24. Passenger Life jackets for over water flight.
25. Liferafts for overwater flight more than 30 minutes flying time or 100 NM from the nearest shore, that can accommodate all occupants of the aircraft; and are equipped with:
    - A pyrotechnic signalling device; and,
    - A survival kit.
26. Anti-icing modifications applicable to aircraft type and operating temperatures.
27. Fireproof/Suppressant bag for laptop and Personal Electronic Devices (PED).
28. All materials used in upholstery and internal trim embody only approved fire-blocking materials their construction.
29. Cockpit cameras are fitted where available for the aircraft type and the installation is agreed with the relevant Shell Technical Authority - Air Transport (TA1); and where cameras are fitted;
    - Procedures are in place to only use the data from cockpit cameras for accident and incident investigation, in line with Just Culture and relevant privacy agreements, only;
    - Procedures are in place to safeguard the recordings and prevent unauthorised use;
    - Cameras are positioned such to record the full instrument panel and pilot actions; and,
    - Maintenance requirements in place that periodically check the cleanliness and serviceability of the camera system.
30. Autopilot - Operations are permitted without autopilots in the Viking De-Havilland Canada Twin Otter DHC-6 series and Beechcraft 1900 series aircraft, providing the aircraft is operated by two pilots.
31. Aeroplane crew shall wear constant-wear type life jackets when conducting specialist operations low level, over water.
32. Seek approval from the Shell Technical Authority - Air Transport (TA/1) for the use of aeroplanes in Specialist Operations:
    - Any shortfalls or differences in the additional equipment specified in 3-30, are agreed with the relevant Shell Technical Authority - Air Transport (TA/1).

## GUIDANCE

1. When several aeroplanes of the same type are contracted, the cockpit layouts should be standardised wherever practically possible.
2. No further guidance.
3. No further guidance.
4. No further guidance.
5. See **FOR 03.06** Flight Following.
6. See **FOR 01.09** – TAWS.

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7. See **FOR 01.08** – ACAS.
8. No further guidance.
9. Underwater Location Beacons – only required when CVFDR etc fitted. The aircraft operator should have reasonable access to receiving equipment and that this equipment may be quickly dispatched to the accident site.
10. No further guidance.
11. No further guidance.
12. No further guidance.
13. No further guidance.
14. No further guidance.
15. AED equipment should be cleared for use on the aircraft type.
16. Seatbelts should have a release lever with 90° of movement to unfasten.
17. No further guidance.
18. No further guidance.
19. No further guidance.
20. No further guidance.
21. No further guidance.
22. No further guidance
23. Contents of the First Aid kit should be tracked for usage and life.
24. No further guidance.
25. No further guidance.
26. No further guidance.
27. See **FOR 02.09** Aircraft Documentation.
28. No further guidance.
29. Cockpit Cameras:
    - Could be OEM or STC fitted and approved items;
    - Typically, have two hours internal recording time and a card that will provide eight hours plus, and need not record to the CVFDR or similar;
    - A typical camera fit is:
        - **https://www.appareo.com/aviation/flight-data-monitoring/vision-1000/**
        - This camera is fitted in all new Airbus Helicopters and is available as a simple STC for many other types.
    - Consideration should be given to adding a serviceability requirement as a Minimum Departure Standard for the camera system.
30. No further guidance.
31. No further guidance.
32. Specialist Operations include seismic and survey, long-line, onshore utility use and search and rescue (SAR):
    - Additional equipment for aeroplanes in specialist roles (e.g. seismic and pipeline inspection, etc.) are detailed in the relevant AOR (Section SPO).

## REFERENCES

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## REFERENCES

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP 690-5 - Helicopter and Equipment.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 07.02 Equipment Specifications – Helicopters

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-4:**

1. Use only helicopter types that have been assessed as acceptable by Shell Aircraft and are agreed with the relevant Shell Technical Authority - Air Transport (TA1).
2. Fit the following additional equipment, items 3-28, for helicopter contracts, exceptions are made in contracts for less than 100 flight hours per annum and ad-hoc contracts, any exceptions are agreed with the relevant Shell Technical Authority - Air Transport (TA/1).
3. Four-axis Automatic Flight Control System (AFCS).
4. Emergency Locator Transmitter (ELT), Crash Position Indicator (CPI) which is jettisonable post-crash and which are compliant with European Technical Standard Order (ETSO) C126 or later approved version are fitted;
    - ELT/CPI – has a minimum specification of Cosmicheskaya Systyema Poiska Aariynyich Sudov (COPAS)/Search and Rescue Satellite Aided Tracking System (SARSAT) 406 MHz capable, with an Identification Code registered to the aircraft and operator, GPS capability and can transmit on 121.5/243 MHz;
    - ELT is registered with the appropriate national agency and the responsible parties registered as ELT contacts are detailed in the aircraft operator's Emergency Response Plan.
5. Underwater Locator Beacon (ULB), which has minimum 90-day battery life and is compliant with ETSO C121b or later approved version;
    - ULB is attached to the CVR and FDR, or combined CVFDR.
6. Terrain Awareness Warning System (TAWS):
    - Helicopter TAWS (HTAWS) software is installed where available for aircraft type and region.
7. Airborne Collision Avoidance System (ACAS):
    - Minimum ACAS I;
    - ACAS II when available for aircraft type, and agreed by Shell Technical Authority - Air Transport (TA1); and,
    - ACAS II fitment may be exempt by risk assessment for low traffic areas, and agreed by Shell Technical Authority - Air Transport (TA1).
8. Helicopter Flight Data Monitoring (HFDM) systems or equipment to enable the download of data.

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9. Health and Usage Monitoring System (HUMS) system installed, which is OEM supported and meets documented certification requirements:
    - The HUMS monitor vibration data of the following, using a combination of spectrum analysis and advanced diagnostic (proprietary signal processing) techniques;
    - It includes a diagnostic capability for every dynamic component in the drive train:
        - Engine to main gearbox input drive shafts;
        - Main gearbox shafts, gears, and bearings;
        - Accessory gears, shafts, and bearings;
        - Tail rotor drive shafts and hanger bearings;
        - Intermediate and tail gearbox gears, shafts, and bearings;
        - Main and tail rotor track and balance;
        - Engine health.
10. Liferafts compliant with European Technical Standard Order (ETSO) C70 or ETSO 2C505:
    - Helicopters operating over water are fitted with at least two liferafts with a total normal capacity that will carry all the people carried;
    - Each raft overload capacity based on loss of the largest raft, sufficient for all people carried;
    - All life rafts are equipped with an ELT which has COSPAS-SARSAT with an Identification Code registered to the aircraft and operator, 406 MHz, GPS, and transmits on 121.5/243 with voice capability, in addition to an approved offshore survival kit. All loose equipment is attached to the raft with a lanyard;
    - A minimum of one life raft is externally mounted;
    - For external rafts, the primary deployment method is by single action from the normal crew positions; the secondary deployment is from the passenger compartment with the cabin in an upright attitude; and deployment is possible from outside the helicopter when in either an upright or inverted attitude; and,
    - All life rafts are reversible or self-righting, double chambered, and capable of being tethered to the aircraft and be readily accessible in the event of ditching.
11. Cabin push-out windows (ditching emergency exits) fitted with emergency push-out windows in locations suitable for emergency underwater egress;
    - Emergency push-out windows and Type IV exits are installed in all locations that are suitable for emergency underwater egress (typically those greater than 430mm by 350mm);
    - Hand holds are provided adjacent to assist the location and operation of emergency exits;
    - All push-out windows and Type IV Emergency Exits are clearly highlighted with Helicopter Emergency Escape Lighting (HEEL); and,
    - There is a suitable means of opening that is resistant to inadvertent operation and which is suitably marked by placards and contrasting colour(s).
12. Helicopter Emergency Exit Lighting (HEEL), emergency exit marking systems are fitted which identify emergency escape hatches, exits and push-out windows by illuminating their perimeter and is automatically activated following the flooding of the cabin.
13. Seating layout;
    - Exits are aligned with seat rows;
    - Passengers are seated no more than one person from a Push-Out Window/Emergency Exit; and,
    - Seats are clearly marked to identify which exits are suitable for Extra Broad Passengers (XBR).
14. A forward-facing tail camera with presentation of the picture in the cockpit is fitted if available for the aircraft type and the installation is agreed with the relevant Shell Technical Authority — Air Transport (TA/1).

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15. Cockpit cameras are fitted where available for the aircraft type and the installation is agreed with the relevant Shell Technical Authority - Air Transport (TA/1);
    - Where cameras are fitted;
        - Procedures are only in place to use the data from cockpit cameras for accident and incident investigation, in line with Just Culture and relevant privacy agreements;
        - Procedures are in place to safeguard the recordings and prevent unauthorised use;
        - Cameras are positioned such to record the full instrument panel and pilot actions; Maintenance requirements in place that periodically check the cleanliness, and serviceability of the camera system.
16. Automatically deployed floatation equipment;
    - Flotation equipment appropriate to the Significant Wave Height (SWH) conditions in the area of operations;
    - Commercial Air Transport (CAT) operations are not conducted with SWH over the ditching certified capability; and,
    - Procedures are in place for Float Arming during offshore flying.
17. Satellite Flight Following System (SFFS);
    - If ADS-B or ATC radar coverage is not available in the full operating area, Satellite Flight Following System is installed.
18. High-back Passenger Seats fitted with four-point Upper Torso Restraint (UTR) Harnesses:
    - Seat belts consist of four straps; and,
    - Loop type straps present a snagging hazard and are prohibited.
19. Survival Kits appropriate to the area of operations are carried.
20. High Intensity Strobe Lights (HISL):
    - May be exempt by risk assessment for low traffic areas; and,
    - Restrictions are placed on use of HISL on the ground.
21. Obstacle Detection Aids, where available for the aircraft type and when assessed as appropriate by Risk Assessment are fitted.
22. Transponder and Mode S — Mode C is acceptable for non-Airborne Collision Avoidance System (ACAS) equipped aircraft.
23. Automatic Dependent Surveillance (ADS)-B compatible equipment is fitted when ADS-B available in the operating area.
24. CVR (Cockpit Voice Recorder) and FDR (Flight Data Recorder) or a Combined Cockpit Voice and Flight Data Recorder (CVFDR).
25. First Aid Kits:
    - Suitable and comprehensive first aid kits for the area of operation are be carried on all aircraft;
    - Kits are serviced as part of the aircraft role equipment; and,
    - Use of the kit is reported through the normal defect reporting systems so that used items may be replenished prior to the next flight.
26. Materials used in upholstery and internal trim embody only approved fire-blocking materials for in their construction.
27. Passenger briefing cards, which include the location of first aid equipment and brace position.
28. Aircraft documentation as required by operator and National Aviation Authority (NAA).

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29. Install additional equipment specified for each helicopter type:
    - Sikorsky S92A:
        - Jettisonable windows within the four-cabin emergency exits — Sikorsky option No. 77005;
        - Passenger seat headrests;
        - 3 or 5 bag flotation system, appropriate to operating area. (3 bag tropical only).
    - All other types refer to relevant Shell Technical Authority — Air Transport (TA/1).
30. Seek approval from the Shell Technical Authority — Air Transport (TA1) for the use of helicopters in Specialist Operations and other defined situations:
    - Any shortfalls or differences in the additional equipment specified above, are agreed with the relevant Shell Technical Authority — Air Transport (TA/1).

## GUIDANCE

1. Contracted aircraft are certificated to one of the following specifications:
    - Code of Federal Regulations Title 14 Part 29 – Airworthiness Standards Transport;
    - Category Rotorcraft (FAR 29) Amendment 45;
    - Joint Airworthiness Regulations 29 (JAR 29) Change 1;
    - European Aviation Safety Agency (EASA) Certification Specifications, Acceptable;
    - Means of Compliance for Large Rotorcraft (CS-29) Initial issue;
    - FAR 27 Amendment 31;
    - JAR 27, Issue 1;
    - CS-27, Initial issue;
    - Later equivalent standards: and are acceptable;
    - Contracted aircraft are fully equipped for IFR Operations relevant to the region of operations;
    - When several aircraft of the same type are contracted, the cockpit layouts should be standardised wherever practically possible; and,
    - Consider contracting aircraft with the latest Aircraft Management Software (AMS), e.g. Phase X for Leonardo AW139.
2. Where available for the aircraft type, consider the installation of OEM software for offshore approaches, or alternative capabilities using Performance-based Navigation (PBN) capabilities to allow for automated approaches based on defined profiles.
3. See **FOR 01.07** – Automation Policy.
4. In some areas, such as offshore UK, an automatic deployment capability (ADELT) is mandatory. ELTs should be located in an area where they can easily be deployed or alternatively best protected in the case of an accident, e.g. dinghy packs and crew lifejackets. If automatically deployed, features should include crash switches, immersion switches, and the unit should be buoyant. If portable, they should have integral and self-deployable aerials.
5. Underwater Location Beacons - The aircraft operator should have reasonable access to receiving equipment and that this equipment may be quickly dispatched to the accident site.
6. See **FOR 01.09** - TAWS.
7. See **FOR 01.08** - ACAS.
8. See **FOR 08.01** - FDM.
9. Documented certification requirements are typically, Certification Specifications and Acceptable Means of Compliance for Large Rotorcraft CS-29, paragraph CS 21465 Vibration Health Monitoring and Acceptable Mean of Compliance, paragraph AMC 29.1465.

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10. No further guidance.
11. No further guidance.
12. Hand holds may not be available is all operating areas and types.
13. No further guidance.
14. See **FAC 03.03** - A means is in place to identify passengers that will be required to be seated next to appropriate exits, as described in the "Step Change for Safety XBR process": Step Change in Safety: **https://www.stepchangeinsafety.net/workgroups/helicopter-safety/**
15. No further guidance.
16. Cockpit Cameras:
    - Could be OEM or STC fitted and approved items;
    - Typically, have two hours internal recording time and a card that will provide eight hours plus, and need not record to the CVFDR or similar;
    - Typical camera fit is:
        - **https://www.appareo.com/aviation/flight-data-monitoring/vision-1000/**
    - This camera is fitted in all new Airbus Helicopters and is available as a simple Supplemental Type Certificate (STC) for many other types; and,
    - Consideration should be given to adding a serviceability requirement as a Minimum Departure Standard;
17. See **FOR 03.14** Float Arming.
18. See **FOR 03.06** Flight Following.
19. Some Leonardo AW139 and AW189 may have loop type seat belts and three point harnesses may only be available in some types, in this instance refer to the relevant Shell Technical Authority - Air Transport (TA1).
20. An enhanced survival kit, suitable for the area of operation, should be carried on flights, which are planned operate in remote, cold or jungle terrain.
21. Leonardo Helicopter Obstacle Proximity LIDAR System (OPLS) is one system.
22. No further guidance.
23. No further guidance.
24. No further guidance.
25. No further guidance.
26. No further guidance.
27. No further guidance.
28. See **FOR 02.09** Aircraft Documentation.
29. No further guidance.
30. Specialist Operations include seismic and survey, long-line, onshore utility use, Search and Rescue (SAR);
    - Additional equipment for helicopters in specialist roles (e.g. long line external load, SAR, etc.) is detailed, where required, in the relevant AOR (Section SPO).

## REFERENCES

## RELATED INCIDENT

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP OHRP 690-5 — Complete Section.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR 07.03 Equipment Specification – Survival Equipment

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-8:**

1. Document a policy to determine when flight crew and passengers wear approved immersion suits and lifejackets for overwater flights in both helicopters and low-level survey aeroplanes.
2. Issue all helicopter passengers and flight crew constant wear lifejackets meeting European Technical Standard Order (ETSO) 2C504, or demonstrated equivalent, with Personal Locator Beacons (PLBs) and Compressed Air Emergency Breathing Systems (CA EBS) that meets the requirements of ETSO-2C519;
    - PLBs transmit on 121.5Mhz and/or Automatic Identification System (AIS); and.
    - PLBs are assessed for compatibility the aircraft Emergency Locator Transmitter (ELT) and Crew PLBs.
3. Issue all helicopter passengers and flight crew with immersion suits which meet ETSO 2C502 or ETSO-2C503, and which have been tested for compatibility with the lifejacket, when the sea temperature is consistently at or below +15 °C for the predicted routes.
4. Display information on passenger clothing requirements, including the type and number of layers required under immersion suits, if applicable to the operating region.
5. Provide hearing protection (where required) for passengers together with instructions for its use.
6. Provide Flight Crew and passengers with approved lifejackets for all over-water aeroplane flights stowed in a position that is easily accessible from each passenger or crew seat.
7. Always use constant-wear lifejackets for overwater flights in all low-level survey aeroplanes.
8. Establish in regions, where a detailed SAR study, which includes an Overall Survival Equation and determination for the worst Credible Emergency Scenario, has been carried out, a documented ALARP demonstration of exposure and sea temperatures, which is agreed with the relevant Shell Technical Authority — Air Transport (TA/1).

### GUIDANCE

1. The survival equipment policy should be documented in an appropriate manual and be based on the detailed SAR study.
2. Wearing of an CA EBS is to be implemented by the Aircraft Operator, when agreed with the relevant Shell Technical Authority - Air Transport (TA1).
    - The requirements of European Technical Standard Orders (ETSO) ETSO-2C504 are for Helicopter constant-wear lifejackets for operations to or from helidecks located in a hostile sea area. The use of pouch-type lifejackets is prohibited on overwater flights in helicopters.

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3. Consideration should be given to wearing immersion suits when the expected rescue time (for all survivors), even in tropical conditions, in sea temperatures of +15°C and above for the predicted routes, exceeds the expected survival time, and additional extra insulation or a suitable Thermal Insulating Garment (TIG) or thermal liners can be worn in addition to the immersion by flight crew and passengers when the sea temperature is consistently at or below +10° for the predicted routes. The requirements of ETSO-2C502 and ETSO-2C503 are for Helicopter Crew and passenger integrated immersion suits and normal immersion suits for operations to or from helidecks located in a hostile sea area.
4. No further requirements.
5. No further requirements.
6. No further requirements.
7. No further requirements.
8. SAR studies are carried out, see also BUR MAN 05.01 Managing Risk.

## REFERENCES

## RELATED INCIDENT

- **AAIB Reports 2-1993 as 332l Super Puma G-TIGH**
- **AIBB Reports 2-1993 Super Puma Appendices**

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP OHRP 690-2, 10. Crew — Personal Protective Equipment, 690-3.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## FOR.8 FLIGHT DATA MONITORING

### FOR 08.01 Flight Data Monitoring (FDM)

**MANDATORY REQUIREMENTS**

**The Aircraft Operator is Accountable for Requirements 1-6**

1. Establish and document an FDM programme which is aligned for helicopters, with the HeliOffshore Helicopter FDM (HFDM) Recommended Practices (HO-HFDM-RP-v0), and for aeroplanes, aligned with UK CAA CAP 739 - Flight Data Monitoring, or FAA AC 120-82 - Flight Operational Quality Assurance etc., which is based upon a "Just Culture".
2. Appoint competent personnel to fill specific positions within the FDM programme (such as analyst, gatekeeper or pilot liaison) and provide training for all personnel appropriate to their responsibilities;
3. Download FDM data from all aircraft daily as a minimum (See Guidance) and put in place a process for the review of the data.
4. Establish FDM event thresholds based on flight manual limitations, flight profiles, and Standard Operating Procedures (SOP):

    - Analyse downloaded FDM data for threshold exceedance events within a 24 hour period (operational flight days) through either operator in-house data analysis or third-party services;
    - Set and assess at least three levels of operational risk for each event (Low, Medium, and High);

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    - Validate Medium and High operational risk events which require Flight Crew contacts;
    - Track Flight Crew contacts made for every Medium and High operational risk FDM event;
    - For those events assessed as Medium operational risk, the crew contact, at a minimum, is an advisory contact by email or other means, which alerts the Flight Crew of the event;
    - For those events assessed as High operational risk, more comprehensive contacts are made, these will involve a meeting between the pilot liaison and the Flight Crew involved; and,
    - Trend monitor events, including Low operational risk events, as a routine part of the FDM process, is in place.

5. Establish a process for communication and reporting of the FDM data.
6. Document a serviceability policy for both airborne and ground station equipment and system unserviceability is not to exceed 25 flight hours between data downloads.
7. Track the data download rate as a Key Performance Indicator (KPI) and the target is 95%.
8. Establish an FDM review group which meets at regular intervals to;
    - Validate the reports, including a periodical review of de-identified FDM data findings;
    - Investigate significant events identified by the FDM Programme;
    - Make recommendations for suggested changes to operational procedures or the training syllabus and tracks their implementation; and,
    - Monitor KPIs, Crew Contacts, Downloads etc.
    - Periodically reviews verified FDM trends.
    - Periodically determine the effectiveness of thresholds; and,
    - Meetings are tracked and minuted.

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9. Include an overview of all FDM actions, together with the KPI's, as an agenda item in the periodic Senior Management Reviews.
10. Include the FDM system within the internal audit Quality Assurance (QA) process, using methods that do not risk the independence and security of the FDM program, especially in smaller operations where roles and positions are combined.
11. Define Confidentiality agreements for the use of FDM data.
12. Implement contract requirements to allow Shell the right to audit sufficient aspects of the FDM system to assure that the process is working. This does not imply a right of access to all data, especially that which is identifiable to an individual, unless the aircraft operator wants to use FDM data to demonstrate a specific issue.
13. Agree hardware, scope of coverage, event sets and documented thresholds with the relevant Shell Technical Authority – TA1.

## GUIDANCE

1. The FDM programme should be designed to enable an Aircraft Operator to compare compliance with its SOP's against that achieved in everyday flights, and should:
    - Be constructed to:
        i. Identify areas of operational risk and quantify safety margins;
        ii. Identify and quantify changing operational risks by highlighting when non-standard, unusual or unsafe circumstances occur;
        iii. Put in place appropriate risk mitigation techniques to provide remedial action once an unacceptable risk, either present or predicted by trending, has been identified; and,
        iv. Confirm the effectiveness of any remedial action by continued trend monitoring.
    - FDM programme documentation should include:
        i. Objectives of the system;
        ii. A confidentiality agreement and/or statement;
        iii. A description of the system processes and procedures as below
            1. Data download procedures (including intended maximum time between downloads and analysis of data);
            2. Analysis procedures;
            3. Event communication, pilot liaison and review;
            4. FDM review and report requirements;
            5. A feedback loop to allow timely corrective actions to be taken where safety may be compromised by a significant deviation from SOP;
            6. Storage of FDM data for a minimum period of 12 months and perform routine back-ups;
            7. Key Performance Indicators (KPI's) to identify systemic issues; and,
            8. Just Culture statement, meaning a non-punitive approach being taken unless criminal intent or wilful wrongdoing is evident, and containing adequate safeguards to protect the source data from interference or deletion
2. Training and competence of the FDM personnel should be tracked in an appropriate system and functional positions required for an Aircraft Operator FDM system are appropriate to the size of the operator; FDM personnel training should include:
    - The ability for the person with overall responsibility for managing the FDM programme and the person responsible for FDM data analysis to demonstrate competence as defined in the competence requirements documented for the position.

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3. Data download requirements should be subject to the following:
    - For aircraft operating from remote bases, a means of downloading and transmitting the data daily is established; and,
    - For aircraft away from base for a short number of days, the data can be downloaded on the return to base.
4. Flight crew contact should include;
    - A process for crews to request the analysis of specific flights or events;
    - The most appropriate means practicable to communicate the event, and its consequences, to the crew for an event which requires a contact;
    - For events assessed as High, a more comprehensive process that involves dialogue between the pilot liaison function using the software flight playback capability and the crew involved in the event; and,
    - A contact process for crew conducting operations from bases where face-to-face briefing with pilot liaison personnel and the full use of the analysis playback and review capability may not be possible.
5. Communication and review of FDM data complies with the operator's confidentiality agreement, and the person with overall responsibility for managing the FDM programme should produce regular FDM reports, summarising event activity within the organisation and highlighting learnings from the analysis.
6. The serviceability policy should be documented either in the aircraft Minimum Equipment List (MEL) or a Minimum Departure Standard (MDS) and should include:
    - For long haul fixed wing operations, operating away from the main base for a short period, this may be extended to a Cat C (10-day item);
    - This does not preclude the Aircraft Operator from having a procedure to grant an extension for the minimum departure standards; and,
    - The availability and functionality of the FDM analysis system is assured by means such as service agreements with the equipment, software OEMs and service provider or the provision of back up equipment if necessary.
7. No further guidance.
8. No further guidance.
9. See **SAF 01.00** Management Review.
10. See **SAF 03.00** Continuous Improvement - Assurance.
11. The confidentiality agreement and/or statement should;
    - Define how the FDM data will be managed, how confidentiality will be maintained, under what exceptional circumstances disciplinary action may be taken based on FDM data in the event of repetitive, deliberate violations of SOP's and limitations and/or unprofessional, reckless behaviour (cynical abuse); and,
    - The FDM program should be designed to have the support of all pilots and careful consideration should be given to maintaining the integrity and value of the program.
12. No further guidance.
13. The Aircraft Operator may propose a programme covering specific aircraft tail numbers and pilots where Company use is limited to a small sole use operation out of a larger aircraft fleet and pilot pool. However, the program coverage should include all pilots flying for the Company including replacements and temporary assignments.

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The process map below can be used as a visual reference for the HFDM/FDM processes:

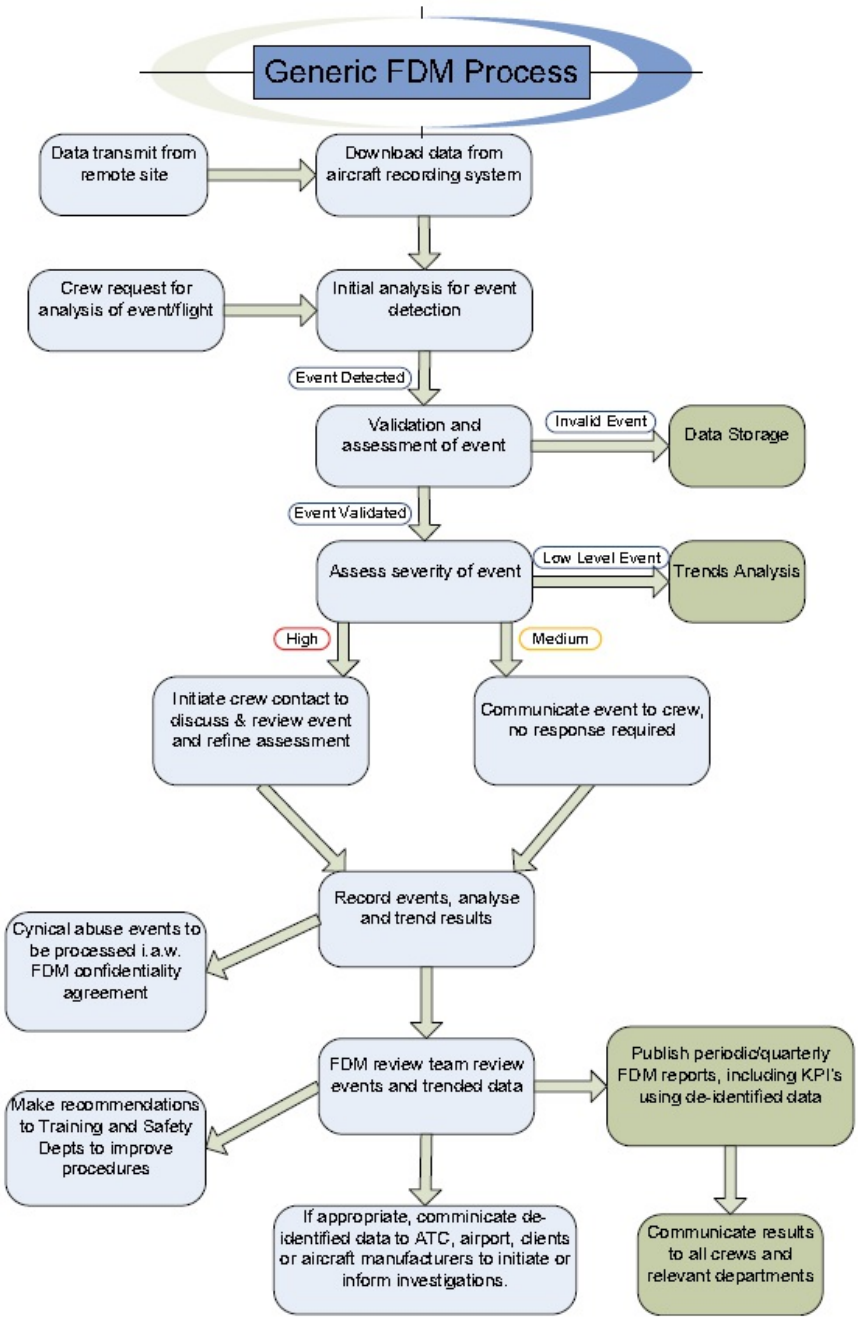


**Figure 1:** Generic FDM process.
Used by kind permission of the Global HRDM Steering Group http://www.hfdm.org/

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## REFERENCES

- **Global HFDM Steering Group – FDM Industry Best Practices.**
- **UK CAA CAP 739**.
- **EASA** GOOD PRACTICE ON THE OVERSIGHT OF FLIGHT DATA MONITORING PROGRAMMES.
- **ICAO Doc 9859 3rd Edition**.
- HeliOffshore HFDM Recommended Practices (HO-HFDM-RP-v1.0).
- UK CAA CAP 739 – Flight Data Monitoring.
- FAA AC 120-82 - Flight Operational Quality Assurance.

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- **IOGP OHRP 690-2 8. Helicopter Flight Data Monitoring.**

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| | Shell specific text |
| | 690 text reads as guidance |

# ENG Engineering Requirements ENG-1

## ENG.1 MANAGEMENT

### ENG 01.01 Airworthiness Management – Basic Principles

#### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-6:**

1. Provide airworthy aircraft and demonstrate that continuing airworthiness activities and aircraft maintenance are performed in accordance with its Approved Maintenance Programme (AMP).
2. Demonstrate appropriate organisational approvals and certificates are in place, appropriate to the size and complexity of the company.
3. Appoint a competent manager (Post-holder, Department Manager, or equivalent), who is accountable for the Operator's management of continuing airworthiness and maintenance, or any contracted continuing airworthiness or maintenance organisations.
4. Perform maintenance activities using an internal Aircraft Maintenance Organisation (AMO) or put in place a contract with an external AMO, detailing the scope of contracted activity and the interfaces between the operator and the contracted party.
5. Document continuing airworthiness management processes, including a process to communicate requirements e.g. formal work orders, to the internal or contracted AMO, clearly describing what maintenance is required, when it has to be performed and to what standard, based on manufacturers' recommendations or the AMP.
6. Demonstrate that the company assurance programme covers all contracted services and that the surveillance of the contracted maintenance is appropriate for the scale and scope of work.

#### GUIDANCE

1. Relationships between aircraft operators and maintenance organisations can be complicated and can include both contracted and sub-contracted arrangements. It is crucial that relationships, including individual company responsibilities are well documented and that robust systems are in place by the aircraft operator to monitor performance both against contractual obligations and regulatory requirements.
2. Contractual requirements should be specified in a separate document that details the activities and obligations of the contractor in the performance of the activity.
3. Where applicable the manager may be approved by the National Aviation Authority (NAA). See also **ENG 05.03** Maintenance Personnel – Competence and Training;
4. The AMO should provide the relevant or detailed maintenance records (see references) of all performed maintenance to the operator. The maintenance records belong to the aircraft and the operator; not the AMO. See **ENG 03.03** Maintenance Management – Maintenance Records.
5. The operator should be responsible for providing the AMP to the AMO. The AMO does not own or control the AMP. Manuals or equivalent should meet the requirements of ICAO Annex 6 Part III (See **ENG 02.01** Continuing Airworthiness – Management) and include a list of current contracted (and sub-contracted) organisations and suppliers describing the type and scope of work, the types of aircraft, engines or components that are maintained and the approved locations for each organisation.

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6. See **SAF 03.00** Continuous Improvement – Assurance. When the activity is part of a long-term contract, the surveillance oversight is included within the Operator's QA audit processes/annual audit plan etc., typically:
    - When the contracted activity is a short-term task (e.g. an aircraft repair, a Non-Destructive Test (NDT) inspection or an aircraft weighing), an appropriate level of oversight should be performed.
    - The Aircraft Operator's QA processes should determine that the contractor is suitably approved and has the required certification for the task, prior to the contracted task being awarded; and,
    - The safety and general HSSE expectations of the contractor should be addressed by the operator; and,
    - Contracted Services could also be authorised by a simple Purchase Order (PO).

## REFERENCES

- ICAO Annex 6 Operation of Aircraft, Part III – International Helicopter Operations.
- **What does the term "detailed maintenance records" mean?** EASA Frequently Asked Question (FAQ): **https://www.easa.europa.eu/faq/19042**

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 1. Basic principles.

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## ENG.2 CONTINUING AIRWORTHINESS

### ENG 02.01 Continuing Airworthiness – Management

**MANDATORY REQUIREMENTS**

**The Aircraft Operator is Accountable for Requirements 1-13:**

1. Manage the Continuing Airworthiness (CA) of its aircraft by providing a CA process commensurate with the size and scope of the company's activities.
2. Employ, or contract, competent personnel to manage the CA function with the relevant competences to perform these tasks.
3. Develop and review the Aircraft Maintenance Programme (AMP) in accordance with applicable regulations and approved by the National Aviation Authority (NAA).
4. Review and manage all airworthiness data and instructions including any Airworthiness Directives (ADs) from the applicable NAA and Service Bulletins (SBs) from the Original Equipment Manufacturer (OEM) or Supplemental Type Certificate (STC) holder.
5. Implement any operational directives or other measures mandated by the governing airworthiness authority in response to a safety issue or an issue reported by a relevant authority.
6. Rectify any defect and damage affecting safe operation, in accordance with applicable regulation or manage the defect in accordance with the approved Minimum Equipment List (MEL).
7. Retain the Maintenance Data.
8. Plan all maintenance, in accordance with the AMP.
9. Control the accomplished maintenance to ensure that it has been executed by an AMO to the required standard and in adherence to applicable regulations and Maintenance Data.
10. Accomplish modifications using data approved by the NAA.
11. Manage all continuing airworthiness records (e.g., airframe/ engine logbooks, life limited parts and log cards), including the operator technical log.
12. Monitor the aircraft configuration to ensure that it reflects the current status of the aircraft in accordance with the Type Certificate.
13. Develop procedures to identify the duties, job descriptions, responsibilities, and qualifications of the staff employed to accomplish the above tasks; and how airworthiness-related activities, including those described above, will be accomplished.

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## GUIDANCE

1. The CA could be managed in-house or contracted out.
2. If required by the NAA head of the CA organisation could be approved as the CA Nominated Post Holder (NPH) and the Continuing airworthiness of an aircraft should be the responsibility of the operator and is part of the AOC. See **ENG 01.01** Airworthiness Management – Basic Principles..
3. The NPH may be supported by suitably qualified and experienced specialist staff such as Type Engineer(s) or Fleet Specialists for the operated aircraft type(s); plus, further staff manning other CA functions including the technical library and technical records. The primary role of the specialist staff should be the management of the Aircraft Maintenance Programme (AMP) and the technical review of all incoming data relevant to the aircraft type they are responsible for guidance. In addition, continuing airworthiness functions may be contracted out if this is an approved practice per NAA and should be formally documented. See **ENG 05.02** Maintenance Personnel – Qualifications and Authorisations, and **ENG 05.03** Maintenance Personnel – Competence and Training,
4. The AMP, should be type-specific and includes OEM minimum requirements, see also **ENG 02.02** Continuing Airworthiness – Aircraft Maintenance Programme and **ENG 02.03** Continuing Airworthiness – Maintenance Data.
5. Subscriptions with OEMs to receive revisions to all technical data and information related to the maintenance of the aircraft or its components should be in place. See **ENG 02.03** Continuing Airworthiness – Maintenance Data.
6. MEL should be NAA approved. See **ENG 02.04** Continuing Airworthiness – Minimum Equipment List.
7. See **ENG 02.05** Continuing Airworthiness – Aircraft Maintenance Records.
8. See **ENG 02.05** Continuing Airworthiness – Aircraft Maintenance Records and **ENG 03.02** Maintenance Management – Maintenance Planning.
9. A documented procedure should be in place to control maintenance and it should state which AMO is permitted to perform maintenance on the aircraft and its equipment. See **ENG 01.01** Airworthiness Management – Basic Principles and **ENG 02.05** Continuing Airworthiness – Aircraft Maintenance Records.
10. See **ENG 02.05** Continuing Airworthiness – Aircraft Maintenance Records.
11. See **ENG 02.05** Continuing Airworthiness – Aircraft Maintenance Records.
12. A system of control should be in place, which allows only parts, meeting the aircraft maintenance programme, to be fitted to company operated aircraft by the AMO. See also **ENG 02.05** Continuing Airworthiness – Aircraft Maintenance Records.
13. The documented maintenance procedures within an operator may be known as the Maintenance Management Manual, (MMM), Continuing Airworthiness Manual (CAM) or the Maintenance Control Manual (MCM) and contained within the MMM/CAM/MCM may be the processes which produce the AMP. This should be in place whether CA is managed in-house, or sub-contracted and the procedures may be required to be approved by the local NAA.See **ENG 01.01** Airworthiness Management – Basic Principles.

## REFERENCES

- ICAO Annex 6 Operation of Aircraft, Part III — International Helicopter Operations

## RELATED INCIDENT

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## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

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## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 2. Continuing Airworthiness — Management.

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## ENG 02.02 Continuing Airworthiness – Aircraft Maintenance Programme

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-4:**

1. Manage an Aircraft Maintenance Programme (AMP) for each aircraft type operated.
2. Document an AMP which complies with the following:
    - Instructions issued by the National Aviation Authority (NAA);
    - Instructions for continuing airworthiness issued by the Original Equipment Manufacturer (OEM) and holders of Type Certificates (TC) and Supplemental Type Certificates (STC);
    - Instructions for continuing airworthiness issued by approved design organisations for modifications and repairs;
    - Additional instructions proposed by the operator and approved by the OEM / STC holder and NAA.; and,
    - Provided the OEM prescribed maintenance is performed operators can add additional requirements without OEM input, if agreed by the NAA.
3. Maintain aircraft according to only one AMP.
4. Review the AMP at least annually, considering the environmental conditions and aircraft utilization to:
    - Ensure compliance with new and / or modified maintenance instructions included in the documents affecting the programme basis (e.g. from the OEM or Maintenance Review Board (MRB));
    - Evaluate the AMP effectiveness by monitoring systems, equipment and component reliability, aiming to reduce repetitive defects, malfunctions and damage to a minimal level; and,
    - Adherence to scheduling of inspection and maintenance tasks; the source of such scheduling may include internal or external organisations, Maintenance Review Boards (MRB), OEM instructions or directives from the governing airworthiness authority.

### GUIDANCE

1. The Aircraft Maintenance Programme or AMP is can also be known as the Approved Maintenance Programme, or Approved Aircraft Maintenance Programme. Management of the AMP could be in-house or contracted to a Continuing Airworthiness Management Organisation (CAMO) or equivalent approved by the NAA. Additional instructions that may be added as agreed with NAA but not necessarily the OEM/STC holder are items such as an additional inspection as a result of experience etc. The Sikorsky S92A engine fuel valve 1500hr check, is not required by OEM but added by operators is one example.
2. The AMP, should include at least the following:
    - A list of the aircraft registrations to which it applies;
    - A link to the most recent OEM mandatory maintenance information such as Airworthiness Limitations & Inspection Requirements (ALIR) or equivalent;
    - Procedures for maintenance pre-flight, between flight, after-flight and/or any other regular inspections (or in an equivalent document) — if required.

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3. An operator can have multiple AMP; however, an aircraft can only be maintained to one AMP.
4. There should be documented procedures for the review interval and data criteria for the AMP effectiveness review. See **ENG 02.06** Continuing Airworthiness – Reliability Programme.

## REFERENCES

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 3. Continuing Airworthiness — Approved Maintenance Programme.

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## ENG 02.03 Continuing Airworthiness – Maintenance Data

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-8:**

1. Manage the appropriate maintenance data (any applicable requirement, Airworthiness Directives (AD), Alert Service Bulletins (ASB), Service Bulletins (SB) or information issued by the Original Equipment Manufacturer (OEM)/Supplementary Type Certificate (STC) holder and/or National Aviation Authority (NAA).
2. Track Airworthiness data and instructions including any Airworthiness Directives (ADs) from the applicable NAA.
3. Evaluate all AD, ASB and SB.
4. Embody all AD, ASB and mandatory SB, and there is an embodiment policy with regard to OEM/STC holder recommended/optional SBs and any applicable bulletins are applied to both aircraft and stored components.
5. Maintain a list of compliance by airframe, engine, and STC installed appliance and develop a method to clearly demonstrate the status of compliance for each airframe and currently installed components.
6. Provide maintenance data, including manuals, which is current and readily available for use by the continuing airworthiness and AMO staff.
7. Clearly track the current revision status, including temporary revision, of all applicable maintenance data and documentation within the organisation (e.g. Maintenance Manuals, Parts Catalogues and Bulletins) against the source documents of the OEM. This includes all master copies and copies distributed to the Approved Maintenance Organisation (AMO), out-stations or contractors.
8. Incorporate any additional SBs that are requested by Shell Technical Authority — Air Transport (TA1).

### GUIDANCE

1. No further guidance.
2. Compliance with ADs, ASB and SBs should include the implementation of any actions that are considered necessary, within the specified timescale, and in accordance with a procedure acceptable to the State of Registry/NAA.
3. A documented technical review process for all incoming directives and bulletins should be maintained;
4. Decisions on SB that the company chooses not to embody should be tracked. An SB is only mandatory unless accompanied by AD.
5. This should also indicate the most current revision of the relevant AD, ASB and SB, regardless of whether any physical action is required.
6. No further guidance.
7. Additional Shell requirement — not adequately covered by OHRP 690.
8. Additional Shell requirement.

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## REFERENCES

- ICAO Airworthiness Manual Document Part III.
- **Do I have to comply with a 'mandatory' Service Bulletin?**
  EASA FAQ: **https://www.easa.europa.eu/faq/19494**

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 4. Continuing Airworthiness – Maintenance Data. Continuing Airworthiness — Maintenance Data.

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## ENG 02.04 Continuing Airworthiness – Minimum Equipment List

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-7:**

1. Document the Minimum Equipment Lists (MEL) for each aircraft in the fleet.
2. Develop an MEL based on, but is no less restrictive than, the Original Equipment Manufacturer (OEM) Master Minimum Equipment List (MMEL), and is approved by the National Aviation Authority (NAA).
3. Incorporate Non-essential Equipment and Furnishings (NEF) into the MEL or a supplement to the MEL, where permitted by local regulations.
4. Make the MEL readily available to flight crews and maintenance personnel for reference.
5. Notify the Pilot-in-Command (PIC) of all deferred defects that affect, or may affect, the safe operation of the aircraft and ensure that the Pilot-in-Command (PIC) retains the final decision on acceptance of an aircraft with deferred defects.
6. Record all recurring defects and highlight them to flight crew and the maintenance organisation at all bases where the aircraft is operated.
7. Control any Shell required equipment, as detailed in contract requirements, through the MEL, or a Minimum Departure Standard (MDS), or equivalent.

### GUIDANCE

1. If no MEL is in place, then all systems should be serviceable for flight.
2. No further guidance.
3. A NEF list, or Configuration Deviation List (CDL) may also be separate documents.
4. No further guidance.
5. No further guidance.
6. No further guidance.
7. No further guidance.

### REFERENCES

- ICAO Annex 6 Part III – International Operations – Helicopters, Attachment B.

### RELATED INCIDENT

### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

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## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 5. Continuing Airworthiness - Minimum Equipment List Continuing Airworthiness - Minimum Equipment List.

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## ENG 02.05 Continuing Airworthiness – Aircraft Maintenance Records

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-9:**

1. Maintain proper maintenance and flight records as required by the applicable National Aviation Authority (NAA) and appropriate to the size and complexity of the company.
2. Employ sufficient staff to maintain the record-keeping process, which have documented procedures, job descriptions, and are trained and assessed as competent.
3. Document an aircraft records process, to consist of the following documents, as a minimum:
    - The airframe logbook;
    - The engine logbook(s) and related components log cards;
    - The Auxiliary Power Unit (APU) logbook(s) (if applicable);
    - Log cards, or tracking process, for any Service Life Limited (SLL) and Time Between Overhaul (TBO) components; and,
    - The Aircraft Technical Log (ATL).
4. Document a process for aircraft records to contain complete and current listings of:
    - Airworthiness Directives (AD), Service Bulletins (SB), or information issued by the Original Equipment Manufacturer (OEM)/Supplemental Type Certificate (STC) holder and NAA;
    - Status of modifications and repairs;
    - Status of compliance with the Aircraft Maintenance Programme (AMP);
    - Status of SLL components;
    - Mass and balance report; and,
    - List of deferred defects.
5. Use an ATL that meets local NAA requirements;
    - Details of the ATL content requirements are documented in the appropriate manual;
    - All defects are immediately recorded in the technical log post-flight; and,
    - Provision for the PIC to date and sign such entries including, where appropriate, the nil defect state for continuity of the record in made;
6. Continuing airworthiness records are managed by means of a reliable aviation maintenance software programme or equivalent, which has its data updated in a timely manner to maintain an accurate record of the airframe, engines and all other components, and is capable of managing:
    - Component tracking, including any condition-based penalties cycles from operational flight data (e.g. increased gross weight, start/stop engine cycles, One Engine Inoperative (OEI) events, etc.);
    - Flight time tracking;
    - Logbook tracking;
    - Compliance tracking for all issued ADs and SBs;
    - Work Order management;
    - The requirements of the approved Aircraft Maintenance Programme (AMP) for each aircraft type;
    - Control the forecasting and recording of aircraft and component maintenance as detailed within the approved AMP;
    - Details required maintenance “due lists” in terms of flying hours, cycles, landings or calendar intervals; and,
    - Inventory control.

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7. Maintain all records of work carried out and demonstrate that the work has been executed to the required standard and internal Quality Control (QC) procedures ensure that all records of performed maintenance from the Aircraft Maintenance Organisation (AMO) are complete and the aircraft is appropriately released to service.
8. Store the records securely to ensure protection from damage, alteration and theft.
9. Document a process to back up electronic records.

## GUIDANCE

1. If applicable - the Air Operator or contracted Continuing Airworthiness Organisation may issue Airworthiness Review Certificates (ARC) for its aircraft, following a documented process using staff who should:
    - Have documented responsibilities; and,
    - Have been assessed for competency and hold authorisation to issue ARCs (if required).
2. For Training and Comptence requirements - See **ENG 05.02** Maintenance Personnel – Qualifications and Authorisations, and **ENG 05.03** Maintenance Personnel – Competence and Training.
3. The system should record compliance with all applicable Airworthiness Directives (ADs) and (Alert) Service Bulletins (SB) for the aircraft and its components. See also **ENG 02.03** Continuing Airworthiness — Maintenance Data.
4. The ATL typically contains, subject to local NAA and Operator requirements:
    - The aircraft type and registration mark;
    - The operator and the AMO;
    - Details of when the next scheduled maintenance is due, including, if relevant any out of phase component changes due before the next maintenance check;
    - The current CRS, for the complete aircraft;
    - The date and place of take-off and landing;
    - The times at which the aircraft took off and landed together with total flight time and / or flight cycles and / or landings;
    - The running total of flying hours, such that the hours to the next schedule maintenance can be determined;
    - Details of any failure, defect or malfunction to the aircraft affecting airworthiness or safe operation of the aircraft;
    - The quantity of fuel and oil uplifted and the quantity of fuel available in each tank, or combination of tanks, at the beginning and end of each flight;
    - Provision to show both the amount of fuel planned to be uplifted and the amount of fuel actually uplifted;
    - A pre-flight inspection signature; and,
    - See also See **ENG 02.04** Continuing Airworthiness – Minimum Equipment List.
5. No further guidance.
6. The system should show the receipt and management of all completed maintenance paperwork including work orders, work packages, aircraft technical log entries and component serviceability data to demonstrate an auditable record. See **ENG 02.02** Continuing Airworthiness – Aircraft Maintenance Programme.
7. In the case of contracted continuing airworthiness management tasks, records may be maintained and kept by the subcontracted organisation on behalf of the Continuing Airworthiness Management Organisation (CAMO), which remains the owner of these documents;
8. No further guidance.
9. Electronic records are typically backed up every 24 hours.

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## REFERENCES

- ICAO Annex 6 Part III – International Operations – Helicopters, Chapter 6.2
- EASA: **https://www.easa.europa.eu/system/files/dfu/Annex%20I%20to%20Decision%202016-011-R.pdf**

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 6. Continuing Airworthiness – Aircraft Maintenance Records.

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## ENG 02.06 Continuing Airworthiness – Reliability Programme

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-4:**

1. For large offshore helicopter and complex aeroplane operators, implement a documented Reliability Programme that monitors the effectiveness of the Aircraft Maintenance Programme (AMP) by recording, as a minimum:
    - Component Mean Time Before Unscheduled Removals (MTBUR) by aircraft type;
    - Flight hour trends of non-serialized parts usage by aircraft type;
    - Flight hour model trends of Minimum Equipment List (MEL)/Minimum Departure Standards (MDS) usage by system and by aircraft type; and,
    - Flight hour Pilot reported discrepancy trends by aircraft type.
2. Review human errors in maintenance and quality through a Just Culture process with the focus on improving company procedures and enhancing the barriers to prevent maintenance errors. These are then trended, by type/model and casual factors related to the events.
3. Alert the Type Certificate (TC)/Supplemental TC (STC) holder to any design feature that increases the risk of a critical error, where practical.
4. Regularly communicate reliability data to the TC/STC holder with a focus on improving low performing systems, extending inspection intervals, human error risk reductions, on repeated “no defect noted” inspections of non-flight critical systems is in place, where practical.

### GUIDANCE

1. In small aeroplane, e.g. survey, business jet, and onshore helicopter operators, where required by regulation, reliability may be monitored by a simple Excel spreadsheet and should be a “fit for purpose” process.
2. In small aeroplane, e.g. survey, business jet, and onshore helicopter operators, a “fit for purpose” system should be in place
3. In small aeroplane, e.g. survey, business jet, and onshore helicopter operators, this information may not be required, asked for or acted upon by the TC/STC holder and it is not practical to track it.
4. In small aeroplane, e.g. survey, business jet, and onshore helicopter operators, this information may not be required, asked for or acted upon by the TC/STC holder and it is not practical to track it.

### REFERENCES

- ICAO Annex 8 Airworthiness of Aircraft, Part II, Chapter 4.2.
- ICAO Doc 9760 Airworthiness Manual, Part IV Chapter 1.7.

### RELATED INCIDENT

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 7. Continuing Airworthiness — Reliability programme.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## ENG 02.07 Continuing Airworthiness – Workplace

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-2:**

1. Provide continuing airworthiness staff with suitable office accommodation, so that they can carry out their designated duties in a manner that contributes to upholding good standards.
2. Provide dedicated space for technical/aircraft records, manuals etc.

### GUIDANCE

1. No further guidance.
2. Fireproof locker should be provided for hard copies of airworthiness records, where required.

### REFERENCES

- ICAO Doc 9760 Airworthiness Manual Part IV Chapter 4.

### RELATED INCIDENT

### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

### IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 8. Continuing Airworthiness — Workplace:

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## ENG 3 MAINTENANCE MANAGEMENT

### ENG 03.01 Maintenance Management – Aircraft Maintenance Organisation Procedures

## MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-3:**

1. Document procedures for the maintenance organisation, contained in a dedicated manual, that is amended as necessary and reflects the actual organisation processes in place.
2. Document procedures for Quality Assurance or Quality Control to allow the maintenance organisation to verify that all maintenance and administration are properly performed and to monitor compliance with procedures and regulatory requirements, including contracted maintenance.
3. Ensure the supplier approval process and any contracted maintenance is appropriate for the scale and scope of work, and a list of current contracted (and sub-contracted) organisations is maintained.

## GUIDANCE

1. The procedures can be in a manual called a Company Maintenance Manual (CMM) or Maintenance Organisation Exposition (MOE), and should include the following:
    - The names, duties and responsibilities of the accountable executive and post holders involved in maintenance management, including their deputies
    - Procedures for Maintenance Check Flights (See **ENG 03.08** Maintenance Management – Maintenance Check Flights)
    - The scope of work authorised under the organisations' terms of approval;
    - The maintenance organisations' facilities, including a list of operating locations, where applicable;
    - Organisational charts detail the structure and responsibilities of the maintenance organisation and its staff;
    - The charts indicate the necessary personnel required to manage, plan, perform, supervise, inspect and certify aircraft as "Released to service".
    - The procedures used to establish the competence of maintenance personnel;
    - The method used for the completion and retention of maintenance records;
    - A description of the procedures for preparing the maintenance release and the circumstances under which the release is to be signed;
    - The personnel authorised to sign the maintenance release and the scope of their authorization;
    - Where applicable, contracted activities, supplier approval process and arrangements for quality assurance thereof;
    - Where applicable, the additional procedures for complying with the maintenance procedures and requirements of the operator and the OEM;
    - The procedures for complying with the information reporting requirements of any reliability programme; and,
    - The procedure for receiving, assessing, amending and distributing within the maintenance organisation all necessary airworthiness data from the organisation responsible for the type design.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

2. See **SAF 03.00** Continuous Improvement – Assurance;
3. See **SAF 03.00** Continuous Improvement – Assurance. Contracted Maintenance could cover: Lifejackets; NDT; Aircraft weighing; Aircraft Painting; Large maintenance checks; HUMS.

## REFERENCES

- ICAO Annex 8, Airworthiness of Aircraft, Part II Chapter 6.3.
- ICAO Annex 6, Part III – International Operations – Helicopters, Chapter 9.2.

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 9. Maintenance Management – Aircraft Maintenance Organisation Procedures.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## ENG 03.02 Maintenance Management – Maintenance Planning

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-3:**

1. Develop an effective process for the scheduling of maintenance appropriate to the size and complexity of the company.
2. Use reliable software (or equivalent which allows for traceability) for the planning of maintenance, in accordance with the Aircraft Maintenance Programme (AMP).
3. Issue work orders, or similar, via the continuing airworthiness processes, listing each scheduled maintenance inspection/check/repair/modification required, for execution by the Aircraft Maintenance Organisation (AMO).

### GUIDANCE

1. No further Guidance.
2. No further Guidance.
3. No further Guidance.

### REFERENCES

- ICAO Annex 8, Airworthiness of Aircraft.

### RELATED INCIDENT

### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

### IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 10. Maintenance Management — Maintenance planning.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## ENG 03.03 Maintenance Management – Maintenance Records

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-10:**

1. Keep detailed maintenance records, allowing the airworthiness status and history of the aircraft to be clearly established.
2. Detail accomplishment of each maintenance task in a work card or worksheet system (or electronic equivalent), which contains detailed records of the work carried out;
3. Track any parts utilised in the performance of maintenance tasks via the paper or electronic system;
4. Clearly identify the Independent/Duplicate inspection requirements to be certified.
5. Document procedures to assure maintenance records are neat, legible, and complete in accordance with local regulation is in place.
6. Document Staged Work Sheets (SWS) or computerised task cards are in place for complex tasks that require the use of multiple OEM maintenance manuals or reference materials, (e.g. engine changes);
    - SWS are in place for tasks where the operator is required to record information and has elected to utilise forms for the process;
    - SWS are part of a revision process to ensure engineers are using the correct revision of the technical publications, e.g. Aircraft Maintenance Manual; and,
    - Design the SWS to reduce the likelihood that steps within a complex task are inadvertently missed and to specifically identify the point(s) at which independent/duplicate inspections are required as part of the task.
7. Identify stamps or electronic signatures that are detailed in the operator procedures and are listed in the organisations' documented processes against the names of the authorised personnel.
8. Collate the work cards or worksheets into a work package which contains maintenance records in a structured manner.
9. Refer to the revision status of the maintenance data used in the maintenance records.
10. Check all maintenance records for completeness and compliance as detailed in the documented procedures.

### GUIDANCE

1. Retention and transfer of the records should be such that, when required, the status of the aircraft and its components can be readily established. See also **ENG 02.05** Continuing Airworthiness – Aircraft Maintenance Records.
2. Work cards or worksheets should contain and make precise reference to the maintenance data required for the task(s) and are protected against unauthorised alteration.
3. No further guidance.
4. Independent/Duplicate Inspections are carried out in accordance with **ENG 03.05** Maintenance Management – Independent Inspections.
5. No further guidance.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

6. Complex tasks which should be detailed on SWS typically include these tasks:
    - With multiple stages, such as removal, disassembly, test, inspection, repair and installation;
    - Involving maintenance on multiple systems; or
    - That require more than one shift to complete; or
    - Involve multiple trades and staff;
    - The SWS should identify the duplicate to be performed at key stages during the completion of the overall task and sequences them so that work is suitably inspected and certified prior to it being hidden by further assembly;
    - A pre–use check by the maintenance staff should be carried out to determine that the SWS and Aircraft Maintenance Manual (AMM) are aligned. If there is a discrepancy of dates then a process should be detailed;
    - The SWS should seek to minimise the risk of maintenance error by including or identifying lessons learned from previous maintenance error investigations; and,
    - Complex maintenance tasks are sub-divided into clear stages allowing a record of accomplishment at each stage.
7. See **ENG 05.02** Maintenance Personnel — Qualifications and Authorisations.
8. No further Guidance.
9. No further Guidance.
10. No further Guidance.

## REFERENCES

- ICAO Airworthiness Manual Document Part III — Chapter 9.

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFRENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 11. Maintenance management — Maintenance records.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## ENG 03.04 Maintenance Management – Foreign Object Damage Checks

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirement 1 to 6:**

1. Implement verification check post-maintenance for damage, security, tools, cleaning materials such as rags and equipment, to minimise Foreign Object Damage (FOD).
2. Implement a process to minimise FOD on aircraft and components under maintenance;
3. Carry out verification checks on completion of each maintenance task, to ensure the aircraft or component is clear of all tools, equipment, cleaning materials such as rags and any other extraneous parts and material, and that all access panels removed have been refitted correctly.
4. Record verification checks on the maintenance work card system;
5. Conduct leak checks when any maintenance has been performed which compromises the integrity of the fuel, oil, or hydraulic systems;
6. Prevent of Foreign Object Damage (FOD) during maintenance activities, engine ground running and flight line activities;
    - Work areas, including ground running and flight line areas, are maintained in a clean and tidy condition;
    - The flight line is kept clear of loose and blown articles during engine running and other flight line activities.

### GUIDANCE

1. Foreign Object Damage (FOD) is defined as damage caused to aircraft or its components by any substances or assemblies have been allowed to invade the aircraft or aircraft components.
2. Procedures on aircraft under maintenance should typically cover the following, as examples:
    - Exposed components, pipes and electrical connectors on the aircraft are fitted with covers or blanks during maintenance;
    - All components not fitted to aircraft, are fitted with blanks and covers where appropriate; and,
    - Any other extraneous parts and material should also cover blanks, covers, rags, cleaning materials etc.
3. No further guidance.
4. Leak checks should be recorded and certified appropriately.
5. No further guidance.

### REFERENCES

- ICAO Annex 8, Airworthiness of Aircraft.
- ICAO Doc 9760, Airworthiness Manual.

### RELATED INCIDENT

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 12. Maintenance management — Foreign Object Damage checks.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## ENG 03.05 Maintenance Management – Independent Inspections

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-8:**

1. Define and document procedures, plus a list of Critical Maintenance Tasks (CMT), based on Original Equipment Manufacturers' (OEM) instructions for continued airworthiness, requiring independent/duplicate[1] inspections for each aircraft type.
2. Document the scope and content of duplicate inspection, and the recording and certification of duplicate inspections within the aircraft's maintenance records.
3. Subject CMTs to a duplicate inspection carried out by firstly, an engineer holding "Certificate of Release to Service (CRS)" authorisation who assumes full responsibility for the satisfactory completion of the work, then a second person not involved in the original task, who confirms that no deficiencies have been found and that the work has been satisfactory completed.
4. Document training, competence and authorisation requirements or those staff approved to perform duplicate inspections on the aircraft or components.
5. Require detailed CMT procedures for duplicate inspections during complex or lengthy tasks using Staged Work Sheets (SWS) (e.g., an engine or gearbox replacement, where duplicate inspections are performed at key stages of the overall task to ensure the current work is properly inspected and certified, before it is covered by further assembly).
6. Document procedures to alert the Type Certificate Holder (TC) or Supplemental Type Certificate (STC) Holder to any design features or maintenance requirements that increase the risk of critical error if/when identified.
7. Identify CMTs as part of the company's SMS. These maybe simple, repetitive tasks, which have been identified as being prone to error (engine cowling closure, oil caps) may be subjected to a secondary inspections and procedures are in place for these tasks.
8. Prohibit single person duplicate inspection processes on Shell contracted aircraft.

[1] The principle of additional inspections on critical aircraft systems is well understood and accepted. National Aviation Authorities (NAA), have given these additional inspections different titles: Duplicate Inspections by the UK CAA; Independent Inspections by CASA, EASA and the UK military; Required Item Inspections (RII) by the FAA, Dual Inspection, or Independent Check by Transport Canada. Shell uses the term Duplicate Inspections.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## GUIDANCE

1. CMT which could also be called Flight sensitive maintenance tasks are tasks that involve the assembly or disturbance of any system that can affect flight path, attitude, or propulsive force, and which, if errors occurred, could result in a failure, malfunction, or defect that would endanger the safe operation of the aircraft. The list of maintenance CMT could be detailed in the Maintenance Organisation Exposition (MOE), Maintenance Management Manual (MMM) or Maintenance Procedures Manual (MPM), or equivalent manual and will include, typically:
    - In the absence of maintenance and inspection standards published by the OEM or National Aviation Authority (NAA); duplicate inspections should be carried out on all flight safety sensitive maintenance tasks;
    - Relevant areas previously identified from maintenance errors can be added;
    - Fly-by-Wire systems, where relevant;
    - Overhaul, calibration or rigging of components such as engines, propellers, transmissions and gearboxes, where relevant;
    - Installation of aircraft engines, propellers, transmissions, drive shafts and rotors; and,
    - The installation, rigging and adjustment of flight controls;
2. The content and scope of a duplicate inspection check should include, where applicable;
    - Correct assembly and locking of all parts that were disconnected or disturbed
    - Full and free movement of the system over the complete range;
    - Correctly-tensioned cables with correct clearances at secondary stops;
    - Operation of the control system to ensure operation in the correct sense;
    - Separate system checks if the control system is duplicated to provide redundancy; and,
    - That, where different control systems are interconnected such that they affect each other, all interactions are checked through the full range of movement.
3. Certification of duplicate inspections should contain the signatures of both persons before the relevant CRS is issued and as a second person carrying out a Duplicate Inspection is not issuing a maintenance CRS; they are not required to hold CRS certification privileges;
4. The training, competence and authorisation procedures should demonstrate that:
    - The authorised signatories for duplicate inspections are trained and have gained experience on the specific control systems being inspected;
    - That any staff authorised as a “second signatory” are suitably qualified by the company to carry out the inspection;
    - That the training and authorisation process can be applied to flight crew when an operational requirement exists, such as when away from normal maintenance facilities, and only minor adjustment of a control is required, there is no alternative and if approved by the NAA; and,
    - See **ENG 05.03** Maintenance Personnel – Competence and Training.
5. See **ENG 03.03** Maintenance Management – Maintenance Records,
6. No further guidance.
7. CMT could also be called up for cowlings, oil caps, or other maintenance tasks that have been identified as prone to error by the SMS and could result in a failure, malfunction, or defect endangering the safe operation of the aircraft.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

8. As example of a single person independent inspection is where an engineer, signs both inspections, the second after having a break. An example of these is in Part M Guidance Material, which allows a Re-Inspection:
    - Reinspection is subject to the same conditions as the duplicate inspection, except that the 'authorised person' performing the maintenance task is also acting as 'independent qualified person' and performs the inspection.

## REFERENCES

- CASA DIVISION 2.D.5: **http://www5.austlii.edu.au/au/legis/cth/consol_reg/car1988263/s42g.html**
- Transport Canada — AWN C010: **https://www.tc.gc.ca/eng/civilaviation/standards/maintenance-aarpc-ans-c010-557.htm**
- EASA — Guidance: **https://www.easa.europa.eu/sites/default/files/dfu/Annex%20I%20to%20Decision%202016-011-R.pdf**
- FAA — RII — CHAPTER 7. REQUIRED INSPECTION ITEMS: **https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC%20120-16F.pdf**
- CASA CAR 42 Subpart G: **https://www.legislation.gov.au/Details/F2020C01134**

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, Maintenance Management - Independent Inspections.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## ENG 03.06 Maintenance Management – Release to Service

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-6:**

1. Prohibit the operation of an aircraft unless it is maintained and released to service by an Approved Maintenance Organisation (AMO).
2. Document a system of 'Maintenance Release to Service' for all aircraft, whether the AMO is in-house or a contracted organisation, that demonstrates the work specified in the work order is carried out in accordance with the applicable rules and an appropriately authorised engineer considers the aircraft/component ready for service.
3. Issue a Certificate of Release to Service (CRS) certified by an appropriately authorised engineer, as authorised by the AMO, where it verified that all maintenance, as required, has been properly carried out and the aircraft/component is ready for service.
4. Perform elementary work or servicing (e.g. oil changes and light bulb replacement) under the supervision of an appropriately authorised engineer.
5. Develop and document remote location procedures to manage any aircraft unserviceability at a location where maintenance support is not routinely provided.

### GUIDANCE

1. There should be a documented process detailing the interface between the Aircraft Operator's Continuing Airworthiness Organisation and the AMO, for all maintenance activities that are outsourced or contracted by the Aircraft Operator.
2. The documented procedure should allow an appropriately rated Licensed Engineer to consider the aircraft/component ready for service.
3. The procedures should require that no aircraft are "Released to Service" unless they are:
    - Airworthy;
    - Appropriately equipped, configured and maintained for their intended use; and,
    - Have a valid Certificate of Airworthiness (C of A), Airworthiness Review Certificate (ARC, if applicable).
4. For authorisations see **ENG 05.03** Maintenance Personnel – Competence and Training, and **ENG 05.02** Maintenance Personnel – Qualifications and Authorisations.
5. Remote locations include offshore installations.

### REFERENCES

- ICAO Annex 6, Part III — International Operations — Helicopters

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 14. Maintenance Management — Release to Service.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## ENG 03.07 Maintenance Management – Maintenance Observation Program

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirement 1-5:**

1. Identify, understand and rectify weaknesses or errors within the organisation via a structured Maintenance Observation Programme (MOP), which the operator or Approved Maintenance Organisation (AMO) has in place.
2. Monitor maintenance practices at regular intervals through the use of formal, regular and documented observations of maintenance activity and its supporting processes at each operational location.
3. Assess a different work processes each month, totalling a minimum of 12 MOP assessments per year (there is no upper limit), at each operational location.
4. Track and analyse the MOP data and implement appropriate action plans.
5. Include the overall performance of the MOP programme in the Quality Assurance (QA) programme.

### GUIDANCE

1. System Description of MOP process:
    - The MOP programme involves an additional oversight of any work process within a maintenance organisation and is considered complementary to the normal supervision activity.
    - It is expected that this activity should be, or is, performed by supervisors or peers who understand the task at hand and/or have the experience with it.
    - The MOP programme should contain the following elements:
        - **Aim:** Identify and mitigate the causal factors that encourage staff to ignore or work round existing procedures and systems;
        - **Process:** Describe the MOP processes, procedures and forms in use and,
        - **System Review:** Determine the effectiveness with the opportunity to improve where considered necessary.
2. The MOP programme involves maintenance personnel at all levels and engagement, communication and individual buy-in is considered when the MOP programme is launched and thereafter.
3. With small operators and limited bases, it may be a challenge to achieve 12 inspections.
4. No further guidance.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

5. See **SAF 03.00** Continuous Improvement – Assurance.

**Observations from Shell Aircraft audits:**

- Observation: Staff were seen manually carrying main rotor blades on/off aircraft rather than using the sling which is described in the AMM. On completion of the task, staff certified that the task was completed i.a.w the AMM (crane used etc).
    - Root cause: There is no crane in the hangar and no alternate procedure for manual handling. Cultural norm – "that's the way we do it here".
    - Potential remedial actions: Install a crane; go to alternate location which has a crane; develop a manual handling procedure. Remind maintainers to only sign for tasks that have been completed i.a.w Aircraft Maintenance Manual (AMM).
- Observation: Staff were short cutting a 120 lbs/ft torque check procedure of tail blade spindles by performing the task in situ rather than installing the spindles into a bench fixture. This was possible using a locally manufactured alternate tool which was visible to all on the tool board.
    - Root cause: Cultural norm - procedural non-compliance to save time. Task and duplicate inspections were certified i.a.w the AMM, despite no disassembly taking place. Management were aware of the practice with no intervention.
    - Remedial action: Removal of alternate tooling until the procedure could be validated by the continuing airworthiness department. The practice was immediately stopped.
- Observation: Aircraft were towed with no wing walkers/team leader – which was a non-compliance with internal procedures.
    - Root cause: there was insufficient staff on the line; a local norm had amended the process so that a tractor driver and man on brakes would suffice; the full towing team was only used near or in the hangar.
    - Remedial actions: A revised procedure was developed and implemented.

## REFERENCES

- FAA – Maintenance LOSA – **https://www.faa.gov/about/initiatives/maintenance_hf/losa/training**

## RELATED INCIDENT

- American Airlines Flight 191 was a regularly scheduled passenger flight operated by American Airlines from O'Hare International Airport in Chicago to Los Angeles International Airport. A McDonnell Douglas DC-10-10 used for this flight on May 25, 1979, crashed moments after take-off from Chicago. All 258 passengers and 13 crew on board were killed, along with 2 people on the ground. It is the deadliest aviation accident to have occurred in the United States.
    - Investigators found that as the jet was beginning its take-off rotation, engine number one, on the left wing, separated and flipped over the top of the wing. The engine separation was attributed to damage to the pylon rigging structure holding the engine to the wing, caused by faulty maintenance procedures at American Airlines.
    - Maintenance issues, and not the actual design of the aircraft, were ultimately found to be responsible for the crash. The investigation also revealed other DC-10s with damage caused by the same faulty maintenance procedure. The faulty procedure was banned.
    - Comment — the faulty procedure involved maintainers not following an SB which required the engines to be removed.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 15. Maintenance Observation Programme.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## ENG 03.08 Maintenance Management – Maintenance Check Flights

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-4:**

1. Document procedures for Maintenance Check Flights (MCF);
2. Carry out MCF:
   - As required by the Aircraft Maintenance Manual (AMM);
   - As required by the operator's continuing airworthiness management after maintenance; and,
   - For verification of a successful defect rectification or to assist with fault isolation or troubleshooting.
3. Perform MCF using competent and trained Flight Crew, considering the aircraft complexity and the level of the maintenance check flight required.
4. Perform a risk assessment and safety briefing prior to the MCF, which considers the risks associated with the flight.

### GUIDANCE

1. MCF guidance should be documented in both maintenance and operations procedures, See **FOR 05.01** Flight Crew – General Training;
2. No further guidance;
3. No further guidance;
4. Operators should identify the need for additional crew and/or task specialists before each intended maintenance check flight, taking into consideration the expected workload and any risk assessment.

### REFERENCES

- EASA MCF Guidance: **https://www.easa.europa.eu/sites/default/files20pdf**
- UK CAA CAP 1038 – Check Flight Handbook: **http://publicapps.caa.co.uk/docs/33/CAP%201038%20JAN17.pdf**
- European Safety Promotion Network Rotorcraft (ESPN-R) — MCF Guidance: **https://www.easa.europa.eu/community/topics/maintenance-check-flights**
  These guidelines include sample manuals and Risk Assessments.

### RELATED INCIDENT

### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

### IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 18. Maintenance Check Flights.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## ENG.4 MAINTENANCE FACILITIES

### ENG 04.01 Maintenance Facilities – General

#### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-5:**

1. Provide maintenance facilities which are capable of enclosing the largest aircraft for which the Aircraft Maintenance Organisation (AMO) or operator is rated.
2. Segregate specialised workshops to ensure that environmental or work area contamination is unlikely to occur.
3. Provide adequate office facilities for personnel and particularly those engaged in the management of quality, planning, and technical records.
4. Provide maintenance facilities which have lighting suitable for the task and provide protection from adverse weather conditions.
5. Implement a Foreign Object Damage (FOD) prevention programme in the maintenance facilities.

#### GUIDANCE

1. Hangars should be available and large enough for the planned heavy maintenance.
    - Line Maintenance may be performed without a hangar; and,
    - The facilities should meet the applicable regulatory HSSE and building requirements.
2. Aircraft component workshops should be large enough to accommodate the components that are planned to be maintained.
3. See also **ENG 02.07** Continuing Airworthiness – Workplace.
4. For maintenance of aircraft, hangars are not essential, but a hangar or other shelter is used during inclement weather (e.g., outside air temperatures <5°C or >40°C, during snowfall, heavy rain, hail or sandstorm). Protection from inclement weather means the hangar or component workshop structures should be to a standard that prevents the ingress of rain, hail, ice, snow, wind and dust. In addition:
    - The working environment should be appropriate for the maintenance task being performed such that the effectiveness of personnel is not impaired. The working environment should be maintained such that:
    - Temperature should be maintained such that personnel can perform the required tasks without undue discomfort;
    - Airborne contamination (e.g. dust, precipitation, paint particles, filings, insects, etc.) should be kept to a minimum to ensure aircraft/components surfaces are not contaminated, if this is not possible all susceptible systems should be sealed until acceptable conditions are re-established;
    - Lighting should be adequate to ensure each inspection and maintenance task can be performed effectively; and,
    - Noise levels should not be allowed to rise to the level of distraction for staff or if this is not possible inspection staff should be provided with Personal Protective Equipment (PPE) to reduce excessive noise.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

5. See **ENG 03.04** Maintenance Management – Foreign Object Damage checks.

## REFERENCES

- ICAO Annex 8, Airworthiness of Aircraft.
- ICAO Doc 9760, Airworthiness Manual.

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## ENG 04.02 Maintenance Facilities – Working Conditions

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-4:**

1. Ensure that personnel work safely in appropriate conditions.
2. Equip personnel with appropriate clothing and hearing protection for work in the prevailing environmental conditions and provide with adequate instructions for its use.
3. Establish a "Working at Height" (WAH) policy and appropriate equipment (Personal Protective Equipment (PPE), access equipment, stands, lifts, harnesses etc.). The WAH policy, including any associated Risk Assessments, is in place for heights above 1.8 meters and meets Shell, local regulatory requirements and covers, as a minimum:
    - WAH, without a work stand online operations/ramp maintenance using the aircraft, designed and installed, maintenance access steps and platforms for documented, short duration, simple tasks;
    - WAH in the hangar or similar maintenance facility;
    - WAH on a suitable Aircraft Docking Stations;
    - Offsite locations, such as emergency landing sites, remote helipads and helidecks; and;
    - Whilst operating for Shell, if aircraft lands at an offsite location (helideck, remote location) and requires maintenance, a Shell HSSE CF, Recommended Practice (RP), WAH 11, "Access for Helicopter Maintenance and Inspection", provides detailed guidance for this situation. This RP is available via the local Shell Technical Authority (TA1).
4. Provide a maintenance working environment such that the particular maintenance or inspection tasks can be carried out without environmentally-caused hazards to the work process or maintenance personnel, or significant distractions.

### GUIDANCE

1. No further guidance.
2. PPE requirements meet local regulatory, company and aircraft OEM requirements, will typically address the use of:
    - Eye Protection;
    - Hand Protection — Gloves etc;
    - Foot Protection;
    - Head Protection, in conjunction with WAH requirements; and,
    - Clothing policy.

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See the **Change Log** for version control information.

3. WAH is defined in the Life Saving Rules as being above 1.8 Meters;
    - EXAMPLE POLICY GUIDANCE FOR WORKING AT HEIGHT ON AIRCRAFT;
    - Operators should eliminate working at height outside the hangar by:
    - Plan work to conduct maintenance and pre-flight inspections inside a hangar using wall or ceiling mounted rails and fall arrest gear or maintenance stands for fixed wing aircraft and helicopters;
    - Revising aircraft inspection programmes such that work on aircraft at height in an unprotected environment is eliminated where it does not degrade the aircraft's airworthiness;
    - If it is not reasonably practicable to eliminate the work at height and the task must be done outside the hangar, for example, on a ramp, flight line or offshore helideck: Use collective fall protection such as an approved Mobile Elevated Work Platform (MEWP) or maintenance stand designed to fit the shape of the aircraft fuselage whenever reasonably practicable;
    - In the case of simultaneous aircraft start-up and departures from the staging area this may mean conducting the pre-flight inspection or the maintenance task away from the staging area or planning the departure of the aircraft in such a way as to ensure that a MEWP can be safely used and not impacted by another aircraft in motion;
    - If the risk of injury due to a fall from height is not eliminated by (a.) above than the contractor should ensure that the distance a person can fall and therefore the effects of such a fall are minimised. This could include the use of nets or foam matting or other systems where practical to prevent contact with the ground. Use personal protection equipment as appropriate;
    - For short duration, simple tasks, climbing on the aircraft should be authorised through a formal risk assessment process and demonstrating that the risk is tolerable considering the environmental conditions and any other extraordinary factors;
    - Equivalent to climbing up or down ladders less than 20 feet (cf. requirement 6.3 in the Working at Height manual) maintain three points of contact always with the airframe, using the integral steps, hand-holds and built in platforms;
    - Provide supervision for the duration of the task as well as emergency rescue capability; and,
    - Other means of fall protection should be researched with the aircraft manufacturer such as the use of nets, the provision of anchor points or vacuum pads for tying off as appropriate to the aircraft type and its mode of use.
4. See **ENG 04.01** Maintenance Facilities – General.

## REFERENCES

- ICAO Annex 8, Airworthiness of Aircraft.
- ICAO Doc 9760, Airworthiness Manual.

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4, 19. Maintenance facilities - Working conditions.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## ENG 04.03 Maintenance Facilities – Tools and Equipment

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-8:**

1. Implement processes for the control of tools and equipment that are used to perform aircraft maintenance.
2. Ensure tools and equipment made available during the execution of maintenance are as specified in the Original Equipment Manufacturers (OEM) maintenance data. Such tools and equipment are supplied by the organisation conducting the maintenance.
3. Ensure tools and equipment are subject to a control process to identify the user, the item's whereabouts and the aircraft concerned; the process includes a reconciliation, daily or prior to an aircraft's release for service, whichever comes first. This process also includes any sub-contractors working on the premises.
4. Ensure tools, owned by the Operator/Approved Maintenance Organisation (AMO) or belonging to maintenance staff are secured when not in use. They are contained in locked tool kits, or a controlled tool store, and the system in use for tracking items, also tracks those that are issued from a tool store, including the contents of each item that is issued from the store as a kit, e.g. rigging kits, or similar kits that contain individual tools, assemblies and parts of tools.
5. Track tools and equipment that require inspection, or service, or calibration, and a system of labelling all such tools and equipment is established to give information on when the next inspection, service or calibration is due, and/or if the item is unserviceable for any other reason. Inspection, calibration, or servicing procedures for all tools and equipment comply with manufacturers' instructions, regulatory requirements and/or applicable industry standards.
6. Retain tool calibration records.
7. Subject tools and tool kits to a regular Quality Assurance (QA) or Quality Control (QC) inspection for serviceability and contents.
8. Ensure, when a remote outstation is set up, all necessary equipment and supplies are available on site according to the authorised level of maintenance.

### GUIDANCE

1. Only the special tooling or test equipment specified by the aircraft or engine manufacturer, or its equivalent, should be used to perform maintenance on an aircraft, unless the use of alternative tooling has been agreed by the National Aviation Authority (NAA) and documented.
2. All equipment used in the performance of maintenance should be inspected prior to use on aircraft to ensure it is serviceable and free from foreign objects.
3. The control system should include the following control processes:
    - Tools and specialised kits located in workshops, (such as sheet metal repair kits) are also controlled in a manner that all can be accounted for;
    - Tools can be marked with a unique identifier and that can be traced to their owner and/or tool kit;
    - Tools kits should have a contents list and any unserviceable tools are identified on this list; and,
    - Any personal tool kits should be arranged so it is immediately obvious if a tool is missing at the end of a duty period.

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See the **Change Log** for version control information.

4. No further guidance.
5. No further guidance.
6. **SAF 03.00** Continuous Improvement – Assurance.
7. No further guidance.
8. No further guidance.

## REFERENCE

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 20. Aircraft components/material management — equipment and tools.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## ENG 04.04 Maintenance Facilities – Bonded Stores

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-13:**

1. Maintain suitable aircraft parts, quarantine and inflammables/explosive storage areas.
2. Document procedures for all aspects of the stores, and a records/control programme is in place.
3. Provide storage facilities for serviceable aircraft components that are clean, well-ventilated, and maintained at a constant dry temperature to minimise the effects of condensation.
4. Prevent unauthorised access to the storage areas.
5. Follow manufacturer's storage recommendations, when available and provide instructions are available for items requiring special handling.
6. Provide dedicated and clearly identified areas to properly segregate incoming, unserviceable and serviceable material.
7. Certify as fit parts to be used on or fitted to an aircraft, which are labelled (tagged) 'Serviceable' and are held awaiting allocation to an aircraft.
8. Ensure parts not yet certified or parts that have failed certification, have reached their life limited expiry date or have been damaged are held in a quarantine store until they are disposed of appropriately (e.g., to be returned to supplier, recertified, repaired, scrapped) and a register for all items in the quarantine area is maintained.
9. Provide properly constructed fireproof storage compartments, which are built and equipped to meet the local regulations, to store inflammable and explosive materials, such as paints and lubricants (this may include some chemicals).
10. Control parts limited by shelf life.
11. Document a process for the identification and disposal of unserviceable parts, materials, tools, and equipment.
12. Document training, competency and authorisation (where applicable) requirements for stores personnel.
13. Inspect incoming components/material to ensure compliance with company procedures to include shipping damage and proper certification:
    - Components with a time interval or life limit have paperwork quality reviewed and are processed per company procedures;
    - Acceptance into supply or movement to quarantine will be permanently recorded by name or company identifier; and,
    - This is supported by a records' system providing full traceability of each item back to its source provider.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## GUIDANCE

1. A demonstrated control process for any components, which due to their size, are held in a location outside the secure storage facility should be in place.
2. The stores processes could be stand-alone or a sub-section of a relevant manual.
3. No further guidance.
4. No further guidance.
5. No further guidance.
6. No further guidance.
7. No further guidance.
8. No further guidance.
9. No further guidance.
10. No further guidance.
11. No further guidance.
12. See **ENG 05.02** Maintenance Personnel – Qualifications and Authorisations and **ENG 05.03** Maintenance Personnel – Competence and Training.
13. Training should cover the inspection and acceptance of the relevant parts per the "Goods Inward" or "Receiving Inspection" processes and the duties required to perform other roles within the facility. See **ENG 05.02** Maintenance Personnel – Qualifications and Authorisations and **ENG 05.03** Maintenance Personnel – Competence and Training requirements.

## REFERENCES

- ICAO Annex 8, Airworthiness of Aircraft.
- ICAO Doc 9760, Airworthiness Manual.

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4, 22. Aircraft components/material management — Bonded, quarantine and inflammables storage areas, and 23. Aircraft components/material management — Responsibilities of stores personnel.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## ENG 04.05 Maintenance Facilities – Aircraft Fuel Tank Checks

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-2:**

1. Document the fuel quality control policies, processes and procedures to assure Fuel Quality prior to delivery to the aircraft are verified as adequate in the logistics chain immediately prior to the point at which fuel is received (and by default the point at which the Aircraft Operator becomes the owner or custodian of that fuel).
2. Take samples from each aircraft sump drain as specified by the airframe manufacturer daily (or, in the case of large aircraft, from each main tank group):
    - Water in suspension tests are carried out, and samples are retained a minimum of 24 hours, or until the next sample is taken, whichever is later;
    - Inspect and test fuel samples for contaminants and water visually and using Shell Water Detector capsule kits or equivalent detection aids;
    - Samples that are minimum of 0.5 litre are taken, unless specified otherwise by the aircraft manufacturer;
    - Only water detection aids that are subject to shelf-life limitations are used and detection aids are not be used beyond their published shelf-life limit;
    - Clearly label sample jars such that the aircraft and sump drain or tank group from which the sample was taken can be clearly identified; and,
    - Sample jars have sealed lids and are capable of being used for a swirl test to identify foreign body contamination.

### GUIDANCE

1. If the Aircraft Operator owns or manages the fuel and/or installation (onshore, offshore or both), then in addition to mandatory requirements above, the Aircraft Operator should maintain quality assurance over, and test all Bulk Storage and Delivery Systems in accordance with documented procedures:
    - Documented procedures should reference the Shell Aviation "Shell Airport Operations Manual" (SAOM) and "Shell Aviation Quality Assurance Manual" (SAQSM), or an equivalent international standard, such as the Joint Inspection Group (JIG) requirements.
2. Sample jars should be stored in compliance with local Health, Safety & Environment (HSE) requirements for the storage of flammable liquids.

### REFERENCE

### RELATED INCIDENT

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 23. Maintenance — Aircraft fuel tank checks.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## ENG 04.06 Maintenance Facilities – Aircraft Refuelling

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-5:**

1. Document and implement a procedure which contains provisions to ensure passenger safety and egress after a spillage or fire when refuelling aircraft with passengers embarking, on board or disembarking.
2. Prohibit any HF transmission (including HF transmissions via an HF data link) during refuelling/defuelling operations.
3. Conduct and document a risk assessment for gravity refuelling and Rotors Running Refuels (RRRF) considering procedures for containment of fuel spillage.
4. Document and implement procedures for the conduct of refuelling with passengers, where this is permitted, and, if RRRF is permitted, it has been subject to a risk assessment;
5. Procedures include the following, in addition to any local regulatory requirements:
    - A pilot is at the controls at all times;
    - Two-way communication is maintained, either by the aircraft intercommunication system or other suitable means, between the ground crew supervising the refuelling and the qualified personnel on board the aircraft;
    - Passengers normally disembark prior to refuelling; however, if, for safety reasons, the Commander decides to refuel with the passengers on board, the passengers are informed of this decision and the actions to take in the event of a fire;
    - Firefighting capability is available and manned;
    - A person is stationed at the aircraft door to communicate with the passengers if they remain on board, and assist evacuation in the event of a fire. This person has visual contact with the refuelling operator.
    - All seat belts are unfastened and there is a minimum of two designated exits from the aircraft;
    - The radar is switched to standby;
    - The aircraft, fuel supply and fuel hose are grounded before removing the fuel cap and inserting the fuel nozzle into the aircraft fuel tank;
    - After refuelling, a member of the crew verifies to the flight crew that all equipment has been removed, the fuel cap has been replaced securely and the aircraft is properly configured for flight; and,
    - If emergency exits are used as one of the minimum of two required exits during refuelling operations, then:
        - The exit area is clear during refuelling operations; and
        - When equipped, an evacuation slide is allowed provided that the escape route on the apron is free from obstacles.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## GUIDANCE

1. No further guidance.
2. No further guidance;.
3. A ‘closed loop’ system, in which fuel vapour is not expelled from the refuelling point is utilised where available.
4. Documented RRRF procedures, which should include both onshore and offshore refuelling, should;
    - Require all staff involved in RRRF to be adequately trained;
    - Detail the control and containment of any potential fuel spillage;
    - Require a secondary exit clear when RRRF with passengers embarking, on board, or disembarking;
    - Specifically prevent the use of fuel delivery nozzles which can be fixed open through ratchets or equivalent devices;
    - Require the use of pressure (closed system) refuelling where such equipment and facilities are available; and,
    - Ensure that RRRF using a gravity system, is only used on aircraft unable to accept pressure refuelling, or where the facility is not available offshore and where local legislation permits.
5. No further guidance.

## REFERENCES

- None

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFRENCE

- IOGP 690 OHRP, Section 690-3 Support, 18. Rotors Running Refuelling;
- IOGP 590 Report — No differences.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## ENG.5 MAINTENANCE PERSONNEL

### ENG 05.01 Maintenance Personnel – Fatigue Prevention

#### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-4:**

1. Develop and implement a fatigue management and fitness to work programme, or equivalent, for maintenance personnel, which complies with national legislation.
2. Apply the following minimum standard to all engineering staff, unless national legislation is more restrictive:
    - Total work periods do not exceed 12 hours in any 24-hour period. Where it is essential that the working period is extended, the Head of Maintenance approves it on a case-by-case basis;
    - Where shifts are regularly rostered with a heavy maintenance workload to be completed through the night, the length of the duty period is reduced from 12 hours to a maximum of 10 hours. The bulk of work is completed by the shifts on duty up to midnight with the residue being completed by a swing shift covering the period from approximately 2300 to 0700 hrs; and,
    - Each full working shift is followed by a minimum 8-hour rest period. When working a 24-hour split shift online operations, at least 6 hours rest is provided excluding travel. There is a minimum of 7 days off per month of which at least 4 are in a minimum of two-day periods. When the location or climate is arduous, the rest period is increased to minimise fatigue.
3. Develop and implement a policy whereby maintenance personnel that are over the normal local retirement age are deemed to be medically fit for employment if directly engaged in aircraft maintenance or test flight activities, unless such a policy is precluded by legislation in the country of operations.
4. Define the required man-hours for each maintenance task, link this to maintenance planning and forecasting, and where companies employ a mix of licensed, unlicensed or recently licensed personnel, this process will indicate that the proportion of those having Certificate of Release to Service (CRS) privileges to others is sufficiently high to ensure adequate supervision of work is provided at all times.

#### GUIDANCE

1. It should be the responsibility of the individual concerned to ensure that he/she does not report for duty or certify if he is genuinely unfit. Issues associated with mental and physical fitness, fatigue, stress, medication, alcohol and drug use may all have a bearing on “fitness to work”.

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2. The two-day rest periods can be relaxed by written agreement with the relevant Shell Technical Authority - Air Transport (TA1) for those operations where personnel are working a back to back roster, e.g.; a four on/four off working cycle.
    - At field locations where only basic accommodation is provided, a regular "time on-site, time off-site" routine should be established to ensure maintenance personnel working under these conditions are not in the field for prolonged periods. The minimum acceptable ratio of time on-site to time off-site is 2:1 and the maximum period on-site does not exceed 2 months;
    - The period spent commuting to and from the operational location should be considered work time when part of a regular "time on-site, time off-site" routine; and,
    - Other than any specific local labour laws, maintenance personnel are not regulated by duty hour limitations. It is incumbent on the management and supervisors of the AMO to locally manage their personnel with due consideration to fatigue and the potential for human factors provoking errors in maintenance.
3. All maintenance staff should be subject to a recurrent medicals, at minimum of two years, and all staff are deemed to be medically fit for employment, unless national legislation is more restrictive;
    - The Approved Management Organisation (AMO) should be encouraged to adopt a policy that requires the periodic medical examination, including eyesight and hearing tests, of all personnel engaged in maintenance activities.
4. No further guidance.

## REFERENCES

- UK CAA PAPER 2002/06 - Work Hours of Aircraft Maintenance Personnel:**https://publicapps.caa.co.uk/modalapplication.aspx?catid=1&pagetype=65&appid=11&mode=detail&id=628**

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 24.Maintenance personnel general requirements – Fatigue prevention and 30. Maintenance personnel – Supervision of unlicensed and recently licensed maintenance personnel.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## ENG 05.02 Maintenance Personnel – Qualifications and Authorizations

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-6:**

1. Employ appropriately qualified and competent Maintenance management and personnel for the task.
2. Document competence requirements for supervisory, licensed and authorised staff.
3. Ensure, personnel carrying out aircraft maintenance hold the appropriate authorisations and endorsements;
4. Develop, implement and document an authorisation process for all personnel performing and certifying maintenance tasks on aircraft and components whereby the operator or maintenance organisation approves the individual to exercise the privileges granted by the licence and/or endorsements held on the range of equipment operated or maintained by that organisation.
5. Grant Authorisations following formal type training and/or local on-the-job training/evaluation.
6. Maintain training and authorisation records for each of the certifying personnel, in the Continuing Airworthiness functions, operator and Aircraft Maintenance Organisation (AMO), which tracks:
    - The person's name and, where applicable, personnel National Aviation Authority (NAA) licence number and company authorisations;
    - The dates when training has been successfully completed;
    - Course certificates for all relevant training; and,
    - The expiry and renewal dates for the authorisations granted.

### GUIDANCE

1. An accountable person is appointed to manage all maintenance activities performed by the Continuing Airworthiness Organisation or AMO, whether these are performed in-house or by a contracted organisation.
2. Requirements should be documented in a relevant manual.
3. Authorisations issued are appropriate to the level of maintenance performed
4. Documented requirements for granting authorisations are in an appropriate manual — See ENG 03.16 Maintenance Personnel - Competence and Training requirements.
5. The authorisation process may include a system of local approvals whereby the operator systematically approves the individual to exercise the privileges granted by the licence, endorsements or certification held on the range of equipment operated or maintained by that organisation. Formal type training may be Original Equipment Manufacturer (OEM), or equivalent level training.
6. No further guidance.

### REFERENCES

- ICAO Annex 8, Airworthiness of Aircraft.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 26. Maintenance personnel — Qualifications and experience.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## ENG 05.03 Maintenance Personnel – Competence and Training

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-9:**

1. Establish a training programme, which provides all responsible personnel, including management, with appropriate initial induction, relevant type and continuation training as defined by their roles and responsibilities and includes details of the accepted training providers, training syllabi and persons/organisations responsible for training.
2. Maintain training records for all personnel and track them in an appropriate process.
3. Establish and document a formal training process for maintenance personnel, who have aircraft certification authorisations, to receive and have Original Equipment Manufacturer (OEM), or equivalent level training, on the type of aircraft to be used.
4. Provide Aircraft Type Engineers (where applicable) with OEM, or equivalent level training, on the aircraft type for which they are responsible.
5. Conduct continuation/recurrent training at least every two years for maintenance personnel, with aircraft certification authorisations, and include as a minimum:
    - Type Specific Training;
    - Changes in relevant regulatory requirements;
    - Change in company organisational procedures;
    - Human Factors;
    - Issues identified from any internal or external analyses of incidents;
    - Information on relevant AD/SBs or similar documents issued since the last training session; and,
    - Changes in company Safety Management Sytem (SMS).
6. Document and perform competence assessments on maintenance and support personnel, who have certification authorisations, at least every two years;
7. Provide a training programme that addresses initial, on-going training and competency for maintenance support personnel performing the Continuing Airworthiness function, including maintenance planning and technical records staff.
8. Provide continuation training, including human factors, training to all other maintenance support personnel, on a two-yearly basis.
9. Prior to promotion to a more senior position or supervisory roles, personnel receive formal instruction in company procedures and responsibilities applicable to the new position and management training appropriate to their level in the company.

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See the **Change Log** for version control information.

## GUIDANCE

1. The induction training programme should also cover suitable management training for all managers, supervisors as well as any contractors;
    - The training should be documented in a relevant document, such as a Training Manual; and,
    - Ongoing training should be designed to ensure personnel with technical responsibilities have the knowledge and skills appropriate to the complexity of the organisation's maintenance activities;
2. See also **ENG 05.02** Maintenance Personnel – Qualifications and Authorisations.
3. No further guidance.
4. No further guidance.
5. Continuation training should be a two-way process to ensure that certifying personnel remain current in terms of procedures, human factors and technical knowledge and that the organisation receives feedback on the adequacy of its procedures and maintenance instructions. Continuation training should also include:
    - Modification standard of the aircraft and components maintained;
    - Human factors issues identified by relevant findings from Quality Assurance audits and the Maintenance Observation Process (MOP) process, see **ENG 03.07** Maintenance Management – Maintenance Observation Program; and
    - It should also address instances where, personnel failed to follow procedures, and the reasons why particular procedures were not always followed.
6. Continuing Airworthiness personnel can have certification authorisations, Certificate of Airworthiness Review, ARC review etc.
7. The training programme should provide sufficient knowledge of applicable regulations, standards, procedures and the operated aircraft types as well as general organisational training on SMS, company procedures and internal systems/programmes linked to aircraft maintenance, any individual roles and job descriptions;
8. Maintenance support personnel should include staff in stores, ramp, ground operations and other support roles;
9. No further guidance.

## REFERENCES

- ICAO Annex 8, Airworthiness of Aircraft

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 27. Maintenance personnel — Training, 28 Maintenance personnel — Continuation/recurrent training and 29. Maintenance personnel — Competence Assessment.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## ENG.6 HUMS

### ENG 06.01 HUMS – Equipment Fit and Procedures

#### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-4:**

1. Fit helicopters with an approved Health and Usage Monitoring System (HUMS).
2. Fit HUMS certified to European Aviation Safety Agency (EASA) Certification Specifications for Large Rotorcraft (CS) CS-29.1465.
3. Fit OEM-supplied and supported HUMS.
4. Document HUMS procedures, to provide an auditable record of the actions and decisions taken and include references to maintenance work cards, where relevant.

#### GUIDANCE

1. Variances to this requirement are referred to the relevant Shell Technical Authority — Air Transport (TA1).
2. After market systems may not meet this requirement, see 1 above.
3. See **ENG 06.04** HUMS Supporting Processes, for after market systems.
4. Documented HUMS procedures should cover the areas detailed in the HeliOffshore HUMS Recommended Practice HO-HUMS-RP-v2.0, Sections 2-10.

#### REFERENCES

- HeliOffshore HUMS Recommended Practice (HO-HUMS-RP-v2.0):
- **http://helioffshore.org/wp-content/uploads/2020/09/HUMS-RP-v2.0.pdf**

#### RELATED INCIDENT

#### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

#### IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 30. HUMS — Equipment.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## ENG 06.02 HUMS – Download and Primary Analysis

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-5:**

1. Define and document the periodicity for the download and initial analysis of Health and Usage Monitoring System (HUMS) data.
    - For Offshore Flights:
        - Data is downloaded and analysed on every return to an operating base (bases are defined in Shell contracts) whether for passenger or crew change, or for shut down; except:
        - When the aircraft routinely returns to the original operating base at a high frequency, due to short sector lengths, the download frequency can be extended out to a period not exceeding 10 hours of elapsed flying time; or
        - If aircraft is based offshore or in a remote location, arrangements are made using portable ground stations and remote Internet connections (if applicable) to provide an equivalent capability.
    - For Onshore Flights:
        - The system is downloaded daily, as a minimum, but when practicable on every return to the operating base; and,
        - if flights are over hostile, onshore terrain, data are downloaded and analysed on every return to an operating base.
    - For Search and Rescue (SAR) operations:
        - Local procedures are documented that allow for authorisation at senior management level (e.g. Operations Director, Technical Director etc.) to extend these periodicities where life may be endangered by delays due to HUMS downloads.
2. Record and certify HUMS download and initial analysis results in the Aircraft Technical Log (ATL), or similar document, prior the aircraft to departing on its next flight.
3. Detail and include the following requirements for action, in the aircraft dispatch procedure for flight, following the download and initial analysis:
    - Where there are no HUMS exceedances — the aircraft is clear for dispatch with no further action;
    - With a yellow, amber, or intermediate HUMS exceedance — the dispatch of an aircraft with an existing alert is subject of either a maintenance action which is recorded and certified, or to control process within the operator's continued airworthiness organisation, a record of which is in the aircraft approved documentation; and,
    - With a red or high HUMS exceedance — the aircraft is not dispatched until a full analysis and, where necessary, maintenance investigation has been completed and any subsequent defect rectification certified, and the aircraft released to service.
4. Implement a secondary HUMS monitoring system using Automated Detection Tools (ADT), where one is available for the aircraft type and is supported by the Original Equipment Manufacturer (OEM).
5. Procedures to record defects, warnings, out of tolerance conditions and rising trends that have been referred for detailed analysis, to either Aircraft Operator's HUMS specialists or the OEM support organisation.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## GUIDANCE

1. The process for the download and initial line analysis of HUMS data, should include all supplementary software applications, toolbars or special checks:
    - High frequency is generally every defined as 30 minutes or so, where the aircraft does not shutdown to refuel or pick up passengers, examples being BSP Operations, SUKEP SNS Operations; and,
    - HUMS In-Flight data transfer systems maybe unserviceable, if the download procedure in this section is applied.
2. Some regulatory authorities or company procedures may not allow certification in the ATL, in these circumstances, similar documents are multi-use workcards, or other formally tracked documentation.
3. No further guidance.
4. Automated Detection Tools, HeliOffshore HUMS Recommended Practice HO-HUMS-RP-v2.0 – Definitions and Section 7;
    - Leonardo Systems — Advanced Vibration Data Mining — AVDM;
    - Airbus System — Flyscan; and,
    - Sikorsky — System built into Ground station.
5. Communications, HeliOffshore HUMS Recommended Practice HO-HUMS-RP-v2.0, Section 6.

## REFERENCES

- HeliOffshore HUMS Recommended Practice (HO-HUMS-RP-v2.0).

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 31.HUMS — Download and primary analysis.

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## ENG 06.03 HUMS – Required Serviceability, Unserviceability

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-5:**

1. Define a Minimum Equipment List (MEL), Minimum Departure Standard (MDS) or similar, equivalent document, which details the HUMS equipment that can be temporarily unserviceable, and includes associated operating conditions, limitations, or procedures as applicable.
2. Base system unserviceability and subsequent deferment of unserviceable channels according to the MEL on the following:
   - The main controlling system, i.e., Data Acquisition Unit or Data Acquisition Processing Unit (DAPU), Bearing Monitor Unit (BMU) or similar, are confirmed to be serviceable, for all flights;
   - The unserviceability or unavailability of any other single component of the system, including individual accelerometers, is:
     - Failure while **Close Monitoring: 0 (zero) flying hours;**
     - Failure while under **Normal Monitoring: 15 (Fifteen) flying hours.**
3. Track deferment periods for individual accelerometers or components as separate defects.
4. Document situations where, when, full HUMS data is not downloaded for technical reasons, such as a card failure or similar, and the system is not under close monitoring, an entry is made in the aircraft paperwork (technical log or similar) allowing for one further flight to be completed.
5. Document a process to confirm that the HUMS equipment is collecting data.

### GUIDANCE

1. The process for the download and initial line analysis of HUMS data, should include all supplementary software applications, toolbars or special checks.
2. HUMS In-Flight data transfer systems maybe unserviceable, if the download procedure in **ENG 06.02** – Download and Primary Analysis is applied.
3. No further guidance.
4. No further guidance.
5. HUMS Data Collection — HeliOffshore HUMS Recommended Practice HO-HUMS-RP-v2.0 Section 5, Para 5.3.

### REFERENCES

- HeliOffshore HUMS Recommended Practice (HO-HUMS-RP-v2.0).

### RELATED INCIDENT

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 33. HUMS — Unserviceability.

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See the **Change Log** for version control information.

## ENG 06.04 HUMS – Supporting Processes

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-3:**

1. Provide the necessary supporting processes for the effective use of HUMS, in particular:
   - Provide HUMS System Performance Reports — HeliOffshore HUMS Recommended Practice - HO-HUMS-RP-v2.0, Section 8 and Annex 1 — HUMS KPI; and,
   - Provide initial and recurrent HUMS training for all maintenance and HUMS Analysis personnel, relevant to the competency level required for their role - HO-HUMS-RP-v2.0., Section 10.
2. Manage the support processes for HUMS in accordance with the HeliOffshore HUMS Recommended Practice — HO-HUMS-RP-v2.0, including:
   - Ground Station Software and Data Management – databases, hardware processes, etc. — Section 4;
   - Download and Primary Analysis — excepting areas where additional Shell requirements are provided — Section 5;
   - Communication – internal, external, etc. — Section 6;
   - Automated Detection Tools and Web Portals — interconnectivity, system use, OEM instructions — Section 7;
   - Responsibilities and Process Descriptions — HUMS staff responsibilities, process descriptions, etc. — Section 9;
   - Management Oversight — corporate oversight, departmental oversight, line level oversight — Section 11; and,
   - Quality Assurance — audit plan, documentation, etc. — Section 12;
   - Appendices — Appendix 1 and 2;
3. Ensure, for after market HUMS systems, an agreement is in place with the OEM for the installed system that mirrors the agreements in place for systems installed by the aircraft OEM. Both agreements contain the following minimum elements:
   - The requirement to pass aircraft data to the aircraft OEM;
   - Contact methods and defined communication protocols, and
   - Threshold setting and amendment protocols.

### GUIDANCE

1. No further guidance.
2. Download and Primary Analysis — See also **ENG 06.02** HUMS – Download and Primary Analysis.
3. In exceptional circumstances after market HUMS can be fitted to legacy aircraft, where no appropriate OEM system is available.

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## REFERENCES

- HeliOffshore HUMS Recommended Practice (HO-HUMS-RP-v2.0).

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 34. HUMS — Support Processes — Training and Data Management.

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## ENG 06.05 HUMS – In-Flight data transfer

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-4:**

1. Fit In-flight data transfer systems, or a similar process, which allows HUMS data to be transmitted to a base is in place, if available for the aircraft type and region.
2. Allow the system to transmit:
   - Remote (Wireless or other means) downloads; and,
   - In-flight Exceedances to a base;
3. Document procedures and training for any communication with the flight crew.
4. Pass relevant information, if applicable, to the flight crew after it is assessed by an appropriately qualified member of staff, based on approved procedures and maintenance data.

### GUIDANCE

1. Variances to this requirement are referred to the relevant Shell Technical Authority - Air Transport (TA1).
2. Wireless download and analysis meet Shell between flight requirements, however, if the system is unserviceable, procedures in **ENG 06.02** HUMS – Download and Primary Analysis should be in place.
3. Procedures should be developed in conjunction with aircraft Original Equipment Manufacturer (OEM) and based on its recommendations.
4. Operators should define training and qualifications of staff. Real Time HUMS, Section 5.10, HeliOffshore HUMS Recommended Practice — HO-HUMS-RP-v2.0.

### REFERENCE

- HeliOffshore HUMS Recommended Practice — HO-HUMS-RP-v2.0.

### RELATED INCIDENT

### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

### IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 35. HUMS — In-Flight data transfer.

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## ENG.7 ASSURANCE AND INCIDENT REPORTING

### ENG 07.00 Assurance and Incident reporting – Quality assurance and occurrence reporting

#### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for Requirements 1-2:**

1. Implement a structured occurrence/incident reporting system throughout the maintenance organisation appropriate to the size and complexity of the company.
2. Implement an independent Quality Assurance or Compliance monitoring system for the complete maintenance process appropriate to the size and complexity of the company.

#### GUIDANCE

1. See **SAF 02.01** Incident Reporting, Investigation and Learning.
2. See **SAF 03.00** Continuous Improvement – Assurance.

#### REFERENCES

#### RELATED INCIDENT

#### SHELL AIRCRAFT MODEL BOWTIE REFERENCE

#### IOGP REPORT REFERENCE

- IOGP 690 OHRP, Section 690-4 Engineering, 16. Quality (Compliance Monitoring) System, 17. Occurrence reporting system.

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# TABLE OF CONTENTS

## SPO 01.01 Security

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for requirement 1:**

1. Document a security programme that is proportionate to the threat against the Operator, its personnel, aircraft, facilities and passengers. The programme:
    - Meets National Aviation Authority (NAA) Security requirements.
    - Includes a process to assess threats and vulnerabilities.
    - Details preventive measures designed to reduce vulnerabilities and deter and prevent the commission of unlawful acts.
    - Describes responsive measures to be taken when an unlawful act has been committed against the operator.
    - Defines the appropriate level and detail of initial, and recurrent training, for staff training personnel involved.

### GUIDANCE

1. The security programme should meet NAA or other national security requirements, and operators should consider aligning their security programme with standards and recommended practices published by ICAO in Annex 17 –Security and ICAO DOC 8973 – Aviation Security Manual.
2. If operating from public airports, operators should establish interfaces with Airport Security Plans and regularly participate in meetings with relevant authorities / stakeholders to coordinate programmes, plans and exercises.

### REFERENCES

- **ICAO ANNEX 17 - Security**
- **ICAO Doc 8973 – Aviation Security Manual**

### RELATED INCIDENT

TBC

### SHELL AIRCRAFT GENERIC BOWTIE REFERENCE

TBC

### IOGP REPORT REFERENCES

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## SPO 02.01 Search and Rescue Operations – Helicopters

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for requirements 1-7:**

1. Maintain a valid Air Operator Certificate (AOC) approved by the National Aviation Authority (NAA) to conduct Search and Rescue (SAR).
2. Document company SAR procedures in an NAA-approved company operations manual which:
    - Describes the management and supervision of SAR flights, and the procedures used for the initiation, continuation, termination, and diversion of a SAR operational flights.
    - Defines the specific operational and weather minima appropriate to SAR operational flights, SAR training flights and other categories (e.g., air tests, positioning, display flights).
    - Specifies that all non-SAR flights for Shell are conducted to normal Commercial Air Transport standards.
    - Contains specific criteria for the selection of SAR crew, including the minimum experience and recency levels;
    - Defines the following performance requirements for SAR operations:
        - Helicopters operating to/from a Final Approach and Take-Off Areas (FATO) at a hospital that is located in a congested, hostile environment operate to Performance Class (PC1).
        - Helicopters operating to/from a SAR operating site in a hostile environment are, as far as possible, to be operated in accordance with PC2. The commander is to make every reasonable effort to minimise the period during which there would be danger to the helicopter occupants and persons on the surface in the event of an engine failure.
        - SAR training flights meet performance requirements as detailed in **SPO 02.03**.
        - Operations in accordance with the Performance requirements defined in **FOR 03.11** Performance - Helicopters are applicable to all other phases of flight.
3. Hazard/ risk assess SAR operations as part of the aircraft operator's Safety Management System (SMS), including the hazards and procedures for the use of portable equipment on board.
4. Establish, document, and maintain a Flight and Duty Time Limitations scheme or crew Fatigue Risk Management System (FRMS) for SAR operations approved by the NAA, and acceptable to the Shell Aircraft Technical Authority (TA/1).
5. Provide all Flight Crew and Technical Crew Members (TCM) with suitable clothing and equipment from head to toe for the environment in which they are operating in, and they are fully trained in the use and operations of such equipment. All equipment used by SAR crew is integrated to ensure safe use and survivability in the event of an aircraft accident.
6. Establish procedures to take all reasonable measures to achieve passenger safety.

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7. Take all reasonable measures to assure that ground emergency services personnel and/or others involved in the SAR activities are familiar with the following:
    - Two-way radio communication procedures with helicopters.
    - The selection of suitable SAR operating sites for SAR flights.
    - The physical danger areas of helicopters.
    - Crowd control in respect of helicopter operations; and
    - The evacuation of helicopter occupants following an on-site helicopter accident.

## GUIDANCE

**Guidance for Requirements 1-7**

1. As required by regulations, this may include further approval and/or AOC requirements under Commercial Air Transport (CAT) operations, or otherwise supplemented by a specific SAR approval, Helicopter Hoist Operations approval, Night Vision Imaging Systems (NVIS), Helicopter Emergency Medical Services (HEMS) approval and Helicopter Offshore Operations approval, as applicable.
2. The SAR Operations Manual typically includes in addition to Mandatory Requirement 2, the following sections:
    - Authorisation and call out procedures.
    - Approved exemptions from NAA Regulations.
    - SAR Operations; Normal & Emergency Procedures.
    - SAR Hoisting; Normal & Emergency Procedures.
    - Experience and Recency Levels – See **SPO 02.02** - Search and Rescue Operations – Training;
    - Weather Minima.
    - Weather requirements for SAR operations will be implemented in accordance with National Regulations and the operators' SAR Approval. If no such weather minima are provided, all SAR operations (training and operational flights) should be conducted in accordance with either the national requirements for CAT operations or Shell weather minima documented in the **FOR 02.04** - Weather Minima, the more conservative weather minima (higher ceiling and visibility) will apply.
    - Night flights should be flown using only Instrument Flight Rules (IFR) procedures and minimums where available and authorised by the National Aviation Authority, otherwise the night weather requirements in **FOR 02.04** - Weather Minima, should apply.
    - Low Visibility Operations (LVO):
    - LVO operations should be approved and conducted in accordance with National Regulations and operator's SAR approvals. Where National Regulations are silent on the subject, EASA Air Operations, Annex V, Part SPA, Subpart E could be used
    - Duties and responsibilities
    - Search procedures
    - Pre-flight preparation and briefing
    - Fuel planning
    - Weather minima & limitations for SAR
    - When used, NVIS should be approved and conducted in accordance with National Regulations. Where National Regulations are silent on the subject EASA Air Operations, Annex V, Part SPA, Subpart H should be used. Additionally, an annual proficiency check should be required for both flight and technical crews in the aircraft or in an approved full flight simulator. Where NVIS are used during SAR, a proficiency check is required in the aircraft to demonstrate proficiency during hoist operations.

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3. The SAR Risk Analysis should cover:
    - Hazards and safety controls for SAR operations and training conducted in the aircraft, through the hazard/ risk assessment processes.
    - An assessment of safety controls in the operator's internal Quality Assurance (QA) program.
4. The current Commercial Air Transport Flight Time Limits documented in SGRAO **FOR 06.05** (Maximum flight Duty Period (FDP) – Helicopters), should be followed with the following provisions:
    - A SAR Commander, having taken into consideration the circumstances of the crew, may exercise his discretion to extend an FDP in order to continue urgent SAR operations. If an FDP is extended, then the subsequent rest period should be a minimum of 12 hrs. Any such extension should be recorded and audited in accordance with published SAR procedures documentation
    - The current Commercial Air Transport Flight Time Limits documented in SGRAO **FOR 06.05** (Flying Duty Periods – Helicopters), should be followed with the following provisions:
    - SAR crews assigned to 24-hour duty where allowed by NAA Regulation and where only training and currency flights are conducted should have no less than 12 hours of on-call rest per 24-hour period which is reducible to 11 hours when accommodation is close to the place of work. When reducing the required 12 hour on-call rest period to 11 hours, the place of accommodation should be no more than 30 minutes from the place of work under normal conditions. These requirements should apply to both pilots and technical crew.
    - Where SAR Technical Crew are drawn from Maintenance or Operations staff, they should only conduct tasks directly associated with their responsibilities as a SAR crewman for the SAR aircraft whilst on duty.
    - Consideration should be given to conducting SAR training flights after the on-call rest period and at the beginning of the standby period.
    - The duty period should be followed by a minimum off duty period of 24hrs.
    - A crew room with comfortable seating and facilities for meals and refreshments should be available for the immediate readiness period.
    - The SAR procedures should clearly state if, when, and how these regulations can be adjusted in exceptional circumstances in order to maintain operational SAR readiness. It should also include an auditable management information, authorisation, and reporting process to record any adjustment, including a recorded assessment by the individual and/or crew SAR Commander of fatigue level, weather and/or nature of tasking as appropriate before accepting any change.
    - If the crew have been called out from a period of standby readiness, then only distress/SAR operations or flights required to maintain an operational SAR state should be flown in the remainder of that duty period. The SAR procedures documentation should cover this topic in detail.
5. No further guidance.
6. No further guidance.
7. No further guidance.

## REFERENCES

- UK CAA CAP999

## RELATED INCIDENT

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## SHELL AIRCRAFT GENERIC BOWTIE REFERENCE

## IOGP REPORT REFERENCES

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## SPO 02.02 Search and Rescue Operations – Training

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for requirements 1-8:**

1. Document minimum experience levels for SAR flight and technical crew. The minimum experience shall not be less than the general requirements in **FOR 04.03** Flight Crew Qualification and Experience – Helicopters, FOR and include SAR specific requirements.
2. Conduct all SAR training in accordance with the aircraft performance requirements detailed in **SPO 02.03** – Search and Rescue Operations – Helicopters and Equipment, Mandatory Requirement 2.
3. Document and conduct initial SAR training for pilots, which includes at a minimum, either a comprehensive formal SAR training course, or if having previous SAR experience operating in a similar SAR environment, an abridged SAR training course. For SAR Commanders training (and / or previous SAR experience) shall include at least 50 hoist cycles** conducted offshore. 20 hoist cycles** shall be at night if night operations are being conducted offshore. (**A hoist cycle means one down- and-up cycle of the hoist hook.) The training program incorporates a ground and flight training syllabus that progresses a pilot, co-pilot, winchman, and hoist operator through day onshore, offshore and night onshore and offshore SAR procedures.
4. Document minimum experience levels for initial SAR training for Technical crewmembers in accordance with the table below for maritime SAR operations:

| Minimum Requirements | |
|---|---|
| **Hoist Operator** | **Rescue Swimmer/ WinchmanRescue Swimmer/ Winchman** |
| Completed a formal training course or previous experience that included at least 50 hoist cycles* conducted offshore. 20 hoist cycles* shall be at night if night operations are conducted offshore. | Completed a formal training course or previous experience that included at least 50 hoist cycles* conducted offshore. 20 hoist cycles* shall be at night if night operations are conducted offshore. |
| Hold a valid company line check certificate as a hoist operator. (initial and annual) | Hold a valid company line check certificate as a rescue swimmer/winchman. (initial and annual) |

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5. Document and implement proficiency training for flight and technical crewmembers and all complete a minimum of 14 hoist cycles within the previous 90 days, including transitions to and from the hover in accordance with the table below for maritime SAR operations:

| Operational Training | Criteria |
|---|---|
| Deck Training<br><br>(Every 90 days) | 6 hoist cycles (when required, one of each to be completed at night unless seasonal limitations preclude night training (high latitudes) - to include (minimum).<br><br>- 2 - High/trail line<br><br>- 2 - Vessel Dead in the Water*<br><br>- 2 - Vessel Underway<br><br>* Can be substituted with Vessel Underway if HOGE OEI performance requirements cannot be achieved due to atmospheric conditions. |
| Wet training (Every 90 days) | 8 hoist cycles – when required, one of each to be completed at night unless seasonal limitations preclude night training (high latitudes), to include as a minimum.<br><br>2 - dummy/drum lifts*<br><br>2 - live lifts**<br><br>2 - basket lifts (where appropriate***)<br><br>* Can be substituted with live or basket lifts<br><br>** Where survivors face a hypothermia threat, lifting/hoisting hypothermic survivors shall be practiced.<br><br>*** If these devices/ deployment methods are not used, it is expected that the operator will conduct four additional wet lifts with other rescue devices for proficiency. |
| Approaches to the water (Every 90 days) | 6* – Flight Management System (FMS) to Flight Director/ Auto Pilot fully coupled patterns to a hover. 3 to be completed at night (unless seasonal limitations preclude night training (high latitudes)).<br><br>6* - Manual approaches to hover (where approved/ appropriate). 3 to be completed at night (unless seasonal limitations preclude night training (high latitudes)).<br><br>* No more than 50% of the required approaches to the water may be completed in a simulator within a 90-day period. |

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| | |
|---|---|
| Instrument and Night Flying<br>(Night/Simulated IMC)<br>(Every 90 days) | At least 3 hours' night/simulated IMC SAR training to include all SAR coupled modes and hoisting is conducted.<br>Whenever possible (if night ops are not seasonally limited) training is conducted at night and not under simulated conditions.<br>Manual flying with sole reference to flight instruments within the previous 30 days.<br>A further one hour of general instrument flying practice during the previous 60 days (actual or simulated). To include 2 precision/non-precision approaches. |
| General<br>(Every 90 days) | 2x - Radar to Electro-Optical/Infra-Red (EO-IR)/ Forward Looking InfraRed Infrared (FLIR) homing searches.<br>2x* - Beacon (e.g., Passenger Locator Beacon (PLB) homing searches, as appropriate (may be conducted in the aircraft or approved full flight simulator)<br>2x - Night Vision Imaging System (NVIS) flights (when NVIS are National Aviation Authority (NAA) approved) in the aircraft or approved full flight simulator.<br>2x - Search techniques using on-board sensors/FMS and Night Vision Devices (NVD) as appropriate (when NVD are approved).<br>2x - Dual hoist hook changeover. (when approved in the Rotorcraft Flight Manual (RFM)).<br>2x - Emergencies and equipment malfunctions, as required.<br>2x -Confined Area Landing (CAL) if onshore SAR is contracted.<br>Mountain flying & hoisting operations – amount & frequency to be defined in the SAR procedures documentation where appropriate.<br>*May be completed in a flight simulator. |

6. Where a full flight simulator for the aircraft type in-use is available and incorporates SAR mission training capabilities, flight crews (and technical crew members where the simulator has such additional capabilities) undergo SAR mission specific, line-oriented flying training as part of their normal simulator training cycle every six months. Such training shall include the practice of representative normal, abnormal and emergency procedures exercises with emphasis on crew resource management and decision-making for all typical crew members.
7. Provide a nominated "safety cover" for all rotary wing over water training flights. In addition, for flights which involve hoisting and recovery of "live survivors" to/from the water:
    - A dedicated safety vessel is in attendance and in communication with the aircraft.
    - It has the means to recover the survivor and / or winchman from the water within five minutes of assistance being requested.
    - The safety vessel keeps a constant watch on the survivor in the water.
    - Deck crew are available to provide assisted rescue and able to as deploy of scramble nets for self-rescue, if required.
8. Prior to the start of operations crew experience and the training programme is agreed and accepted by the relevant Shell Technical Authority - Air Transport (TA/1). In addition, for the duration of the contract, significant changes in crew experience requirements and the training program are also agreed by the TA1.

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## GUIDANCE

1. The minimum experience levels for SAR Aircrew should not be less than the local regulatory requirements for public transport category hoist operations or equivalent. In the absence of any National Aviation Authority (NAA) with more stringent requirements the following guidelines should apply:

| Minimum Requirements | |
|---|---|
| **Pilot-in-Command** | **Co-Pilot** |
| Total hours – In accordance with the requirements of the SGRAO **FOR 04.02** | Total hours – In accordance with the requirements of the SGRAO **FOR 04.02**. |
| Only aircrew with at least one year & 500 hrs previous maritime SAR experience shall be acceptable. | Previous SAR experience is preferred, but not mandatory. |
| Hold a valid line check certificate as a SAR Commander. | Hold a valid line check certificate as a SAR Co-Pilot. |

See also **FOR 04.03** Flight Crew Qualification and Experience – Helicopters.

2. The initial training program should incorporate a ground and flight training syllabus that progresses a pilot, co-pilot, winchman, and hoist operator through day onshore, offshore and night onshore and offshore SAR procedures.
3. As in 2.
4. Continuation training should be conducted using a comprehensive training syllabus that includes day and night training (when night SAR is possible) for all SAR crew, including training in the aircraft and simulator.
5. No further guidance.
6. A nominated “safety cover” boat should be underway or a SAR-capable helicopter with effective two-way communications should be airborne or in an immediate readiness duty status in a location that enables it to render assistance in a timeframe that is appropriate to the local conditions and survival times for all rotary wing over water training flights that should include the following manoeuvres:
    - Prolonged over water hovering or hoist training.
    - Night approaches to the water that descend below 200 feet, including fully automated and manual approaches.
    - Rescue swimmer/live wet training.
    - Continuous visual contact with the operation shall be established by the cover boat prior to deploying the winchman/rescue swimmer to the water.
    - Standby safety cover helicopters should have a hoist fitted to the aircraft and be capable of recovering the persons in the water if necessary.
    - If a cover boat is provided it should be able to pull an incapacitated person from the water without causing further injury.
    - Before starting any of the training operations mentioned above, the type of training, location (latitude/longitude), and the number of persons aboard the helicopter should be passed to and acknowledged by the vessel or helicopter providing cover.
7. No further guidance.
8. No further guidance.

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## REFERENCES

TBC

## RELATED INCIDENT

TBC

## SHELL AIRCRAFT GENERIC BOWTIE REFERENCE

TBC

## IOGP REPORT REFERENCES

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## SPO 02.03 Search and Rescue Operations – Helicopters and Equipment

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for requirements 1-3:**

1. Use only helicopter types that have been assessed as acceptable by Shell Aircraft and are agreed with the relevant Shell Technical Authority - Air Transport (TA1).
2. Conduct Search and Rescue (SAR) hoist operations, including training, in a helicopter capable of sustaining an engine failure with the remaining engine at the appropriate power setting to provide the aircrew with the ability to transition from a hover to safe forward flight without hazard to the aircraft, suspended person(s)/cargo, third parties or property.
    - The ability to transition safely from a hover to forward flight after an engine failure is supported by approved Original Equipment Manufacturer (OEM) performance graphs for the atmospheric conditions in which hoisting is to be conducted.
    - For SAR hoist operations, including training, once established in the operating area, the aircraft commander verifies and updates the pre-flight performance planning taking into consideration the actual atmospheric and aircraft operating conditions and confirm the ability to transition from a hover to safe forward flight following an engine failure.
    - Exceptions to the One Engine Inoperative (OEI) performance requirements listed above are only to be considered if authorised by the National Aviation Authority (NAA), with approved procedures, through an Operations Specifications, or by regulation and the operator has established risk mitigation measures for hoisting without OEI performance that have been agreed with the relevant Shell Technical Authority - Air Transport (TA1).

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3. Additional equipment as per table below, in addition to the requirements of **FOR 07.02**. Full scope to be agreed with the relevant Shell Technical Authority - Air Transport (TA/1):

| Equipment | |
|---|---|
| **Equipment Item** | **Outline Specification** |
| Airframe | • Bubble windows, minimum one.<br>• Four Axis Auto pilot (Auto Hover System and SAR Flight Management (FMS} modes, where available)<br>• Dual Radio Altimeters (RAD ALT) |
| Primary Rescue Hoist | • Dual, permanently mounted |
| External lighting | • Suitable for the operating areas and scope |
| Communication Equipment for SAR Role | • Multi-channel VHF (FM) Marine Band<br>• Winchman's waterproof radio for communicating with flight crew throughout SAR operation<br>• Other equipment required to conduct two-way communications with the organisations for which SAR is being provided and for communicating with the associated ground/maritime emergency services personnel<br>• Additional equipment suitable for the operating areas and scope for which SAR is being provided |
| Direction Finding (Homer) Equipment | • Multi-frequency homing, equipment on VHF (AM), VHF (FM) 406 MHz and UHF. |
| Search Sensor | • Suitable Electro Optic/Infrared sensors |
| Miscellaneous Equipment | • One pair bolt croppers or similar equipment<br>• Suitable equipment for the operating area and scope, covering the following areas:<br>  ◦ Dispatcher harnesses<br>  ◦ Single lift strops<br>  ◦ Static line<br>  ◦ Stretchers etc. |
| Medical Equipment | • The type of medical equipment to be carried is to be directed by local National Regulation and based on level of medical support/accreditation of the medical persons on-board the aircraft. |

4. Track and maintain all, installed specialist, flight and technical crew survival and operational equipment, including all Original Equipment Manufacturer (OEM), Supplemental Type Certificate (STC) requirements.

## GUIDANCE

1. See **FOR 07.02** - **FOR 07.03** Equipment Specifications.
2. See also **SPO 02.02** – Search and Rescue Operations –Training, Mandatory Requirement 2.
3. The use of Night-Vision System (NVIS) is optional, dependent of aircraft type, scope of operation etc. If used, it should be approved and conducted in accordance with National Regulations. Where NVIS are used during SAR, a proficiency check should be carried out in the aircraft to demonstrate proficiency during hoist operations. The use of ship Automatic Identification System (AIS) direction finding equipment should be considered if it is technically feasible.
4. No further guidance

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## REFERENCES

TBC

## RELATED INCIDENT

TBC

## SHELL AIRCRAFT GENERIC BOWTIE REFERENCE

TBC

## IOGP REPORT REFERENCES

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## SPO 04.01 Land Seismic and Heli-rig Operations

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for requirements 1-4:**

1. Conduct all Land seismic and Heli-rig operations in accordance with the requirements detailed in International Association of Oil & Gas Producers (IOGP) Report 420 “Helicopter Guidelines for Land Seismic and Heli-rig Operations”. Where the term “should” is used, this is substituted with the term “shall”.
2. Where reference is made in IOGP Report 420 to the IOGP “Air Management Guide” (AMG), Report 590 V2, May 2017, reference is instead made to the appropriate section of the SGRAO AORs as detailed in the table below:

| IOGP 420 Reference | Subject | AORs Reference |
|---|---|---|
| 2.1 | HSSE MS Requirements | **SAF 00.00** |
| 3.1.1 | Flight Crew Qualification and Experience requirements. | **FOR 04.03** |
| 3.2.1 | Flight Crew Training | **FOR 05.01** etc. |
| 5.1.4 / 5.1.6 | Helicopter performance and type | **FOR 03.11** |
| 5.4.1 / 5.4.2 | Helicopter Equipment fit | **FOR 07.02** |
| 5.4.4 | Minimum Equipment List | **ENG 03.02** |
| 9.3 | Flight and Duty times for Flight Crews | **FOR 06.02** etc. |

3. Provide suitable crash equipment applicable to the operating environment at the base camp or staging areas, in addition to firefighting equipment. Ensure the crash equipment is kept in a crash box, suitable for rapid deployment. Where more than one helicopter is in operation, this same crash equipment is available for rapid loading into one of the helicopters, for transport to a remote crash site.
4. Only permit Human External Transport System (HETS) Class D fixed line in rapid rescue response when the operator meets the equipment, training and competence requirements as described in the relevant NAA requirements, the risks are assessed and documented and Shell Technical Authority – Air Transport (TA/1) approval is given.

### GUIDANCE

1. Any questions on the application or interpretation of Report 420 are to be directed to the Shell Technical Authority – Air Transport (TA/1). .
2. No further guidance.

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See the **Change Log** for version control information.

3. Crash equipment typically includes.
    - Fireman type axe.
    - Large axe.
    - Heavy duty hacksaw with 4 spares blades.
    - Grab hook with long handle or 30 meters of 10 mm non-plastic rope.
    - Harness knife with sheath.
    - Heavy duty crowbar of 1-meter length.
    - 24-inch (61 cm) bolt cutters.
    - 2 Pairs flameproof gloves.
    - 2 Torches (flashlights) with spare batteries.
    - 10 Inch adjustable spanner/wrench.
    - 2 Fire blankets.
    - Wire cutting pliers.
    - Straight metal ladder (8 ft. minimum)
    - 1 set assorted screwdrivers
4. No further guidance.

## REFERENCES

- **IOGP Report 420 – Helicopter Guidelines for Land Seismic & Helirig Operations, Version 1.1, June 2013**

## RELATED INCIDENT

TBC

## SHELL AIRCRAFT GENERIC BOWTIE REFERENCE

TBC

## IOGP REPORT REFERENCES

- 590 page 6 (very bottom) references Report 420 as the guidance Document.

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## SPO 05.01 Aerial Pipeline Inspection

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for requirements 1-5:**

1. Document the procedures for Aerial Pipeline Inspection as applicable to flight crew and other personnel engaged in the Flight Operations Manual (OM), including all normal, abnormal and emergency procedures.
2. Document, specific Aerial Pipeline Inspection risks as part of the company's Safety Management System (SMS).
3. Document that the minimum flight crew required for the operation is never less than a pilot and a trained observer.
4. Complete a safety briefing prior to each flight, when the observer is not a trained pilot and subject to formal aircrew annual safety training and testing, that includes the following:
    - The primary responsibility of the crew member to act as an observer.
    - The necessity to maintain a good lookout for hazards when not occupied with survey duties and to advise the pilot accordingly.
    - A map briefing pointing out all known hazards; and
    - The minimum altitude for the flight.
5. Document flight crew training to meet SGRAO AOR FOR 04.01 – 04.03 requirements with the exception of recent experience requirements, which for pipeline inspection are the following:
    - Pilots have completed 50 hours in Command patrol survey time in the previous six months; and,
    - Pilots have completed a minimum of 10 hours on the contracted aircraft type conducting pipeline operations within the preceding 90 days, or have successfully completed a pipeline inspection line check within the preceding 90 days
6. Define the minimum personal protective equipment (PPE) for pipeline survey operations and provide all occupants involved with the appropriate PPE.

### GUIDANCE

1. Documented procedures for Aerial Pipeline Inspection typically include :
    - Cockpit procedures.
    - Crew responsibilities.
    - Standard callouts.
    - Sterile cockpit procedures.
    - Weather minima.
    - Procedures and training for inadvertent entry into cloud.
    - Procedures and training to perform "unplanned landings" for helicopters.
    - Optimum safe operating heights.
    - Traffic deconfliction.
    - Use of a serviceable transponder in all operational environments.
    - Low level operation and Restricted areas; and
    - Flight following.

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2. Refer to **SAF 02.00** Safety Risk Management.
3. If additional equipment is fitted that cannot be operated automatically without significant inputs from the crew during flight an additional crew member may be required.
4. No further guidance.
5. No further guidance.
6. Based on the risk assessment in requirement 2 above and any national regulations, personal protective equipment typically consists of the following:
    - A flying helmet meeting recognised industry safety standards, for any low-level surveys and helicopter operations.
    - Non-synthetic or fire blocked/retardant trousers and shirt.
    - Cotton undergarments.
    - Appropriate work boots or shoes.
    - Life jackets and immersion suits depending on water temperatures if flight is outside safe auto-rotative/gliding distance from land; and
    - A personal emergency locator beacon
    - See also - **FOR 07.03** Equipment Specification – Survival Equipment.

## REFERENCES

## RELATED INCIDENT

- 4th August 2016 – fatal accident in Louisiana, US. Single pilot in a Schweiser 300, non Shell.

## SHELL AIRCRAFT GENERIC BOWTIE REFERENCE

TBC

## IOGP REPORT REFERENCES

- IOGP 590-S1 is specific to Pipeline inspections but does not address Requirements 1,2,& 4 of FOP 05.04.

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See the **Change Log** for version control information.

## SPO 06.01 Helicopter Hoist Operations

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for requirements 1-10:**

1. Conduct Commercial Air Transport – Helicopter Hoist Operations (CAT-HHO), including training missions, in helicopters that are capable of sustaining an engine failure with the remaining engine at an appropriate power setting, without hazard to the suspended person(s)/cargo, third parties or property at all times.
2. Use only operators which have National Aviation Authority (NAA) approval for Helicopter Hoist Operations (HHO) in place, and have documented procedures for HHO, which are available to flight crew, other aircrew, and passengers, as applicable.
3. Conduct HHO with a minimum crew of two pilots and one hoist operator.
4. Conduct HHO only to assessed sites which have been agreed with the relevant Shell Technical Authority – Air Transport (TA1). Information containing a site's physical characteristics and limitations is made available to crews.
5. Use only hoists which are certified for Helicopter External Cargo (HEC) and are maintained, along with all associated equipment, under a documented maintenance programme which meets the Original Equipment Manufacturers (OEMs) .programme.
6. Only crew and essential passengers are carried during HHO, and all necessary luggage/cargo carried in the cabin is to be properly secured and does not interfere with egress procedures.
7. Define a minimum standard of helicopter and passenger safety and survival equipment appropriate to the task and environment and provide equipment for all HHOs.
8. Establish a formal initial training course for crew, which includes:
    - 50 hoist cycles, of which at least 25 must be in the operational environment.
    - For approved night operations, a minimum of 20 hoist cycles are conducted in the operational environment at night.
    - A hoist cycle means one down-and-up cycle of the hoist hook and includes a transition to and from the hover.
    - Crew pass annual HHO competency checks and conduct LOFT in a simulator.
9. Retain crew currency by completing six hoist cycles within the preceding 90 days or pass a line check prior to operations to demonstrate hoisting proficiency. For approved night operations, at least three of the hoist cycles are to be completed at night.
10. Establish an initial and refresher training course for passengers, including theory and practical elements, and establish recency requirements.

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## GUIDANCE:

1. See **FOR 07.02** - Equipment Specifications – Helicopters, Mandatory Requirement 4.
2. The procedures for HHO typically contain:
    - Planning - to include sources of meteorological data sources for the destination
    - Limitations.
    - Normal procedures.
    - Abnormal Procedures - to include recovery of incapacitated persons and loss of communications
    - Emergency procedures – to include hoist and aircraft malfunctions
    - Communications – to include briefings, standard callouts, and visual signals
    - Risk assessments.
    - Passenger briefing requirements as per **FOR 03.07** (Passenger Briefing)
    - Reference to Wind Farm Recommended Practice (WinReP) - Recommended Practice for Wind Farm Operations and Global Offshore Wind
    - Health and Safety Organisation, Good practice guidelines for safe helicopter operations in support of the global offshore wind industry (G+ Guidelines).
3. No further guidance.
4. All personnel transfers should be conducted to a landing area with adequate size and obstacle clearance for the helicopter being used. If a landing cannot be performed on the location, Helicopter Hoisting Operations (HHO) may be carried out. Site information plates typically include site dimensions and height, location, obstacles, lighting, communications, environmental limitations, and considerations, etc. Refer to the latest versions of the following, as applicable:
    - Guide to Helicopter/Ship Operations, International Chamber of Shipping (ICS).
    - WinRep and G+ Guidelines.
    - UK CAA CAP 437.
5. Equipment typically includes hooks, cables, squibs, shackles, harness, specialist hoisting equipment, etc.
6. Refer to WinReP, for guidance and the cargo policy should clearly reference section 16.5.
7. The minimum standard of helicopter and passenger safety equipment should include:
    - Items as required in **FOR 07.02** (Equipment Specifications - Helicopter) and **FOR 07.03** (Equipment Specifications – Survival Equipment).
    - Specialist hoisting equipment typically includes – Hoist bags, a helmet for person being deployed/recovered, dispatcher harness for hoist operator, cable cutters and a protective glove to tend the hoist cable.
    - Any site-specific safety equipment as required, as an example search lighting/illumination from helicopter for night operations.
8. No further guidance
9. No further guidance.
10. No further guidance.
11. Training should clearly reference WinReP, section 19 and Annex 1, 2.

## REFERENCES

TBC

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## RELATED INCIDENT

TBC

## SHELL AIRCRAFT GENERIC BOWTIE REFERENCE

TBC

## IOGP REPORT REFERENCES

Terms in green are included in the **SGRAO Glossary**.
See the **Change Log** for version control information.

## SPO 07.01 Airborne Survey

### MANDATORY REQUIREMENTS

**The Aircraft Operator is Accountable for requirements 1-10:**

1. Document the procedures for Airborne Surveys for flight crew and other personnel engaged in the Flight Operations Manual (OM), including all normal, abnormal, and emergency procedures.
2. Document, specific risks associated with survey operations as part of the company's Safety Management System.
3. Apply the following minimum fixed wing survey speeds.
    - 130% of clean stall speed (Vs).
    - Minimum survey speed shall be observed even after "zoom" climbs and shall be increased as necessary to account for local conditions such as turbulence and gusty winds.
    - 110% of best single engine rate of climb speed (Vyse, if applicable); and
    - Minimum safe single engine speed (Vsse, if published).
4. Document that the minimum flight crew required for the operation is never less than a pilot and an equipment operator unless survey equipment can be operated automatically without significant inputs from the pilot during flight.
5. Document a minimum fixed fuel reserve applicable to all survey operations of 30 minutes flying time at cruise consumption rate. If, during deployment to and from the survey area a fixed wing aircraft is flown under IFR conditions, apply the IFR fuel requirements in **FOR 02.06** Fuel Requirements – Fixed Wing.
6. Document for geophysical surveys, that crew experience requirements are as per **FOR 04.02** and **FOR 04.05**, with the following additional requirements:
    - Crew have successfully completed a geophysical training programme.
    - Where applicable, have successfully completed a mountain flying course.
    - Flown at least 300 hours in airborne geophysical operations of which at least 100 hours were as a pilot in command or In Command Under Supervision (ICUS) in airborne geophysical operations.
    - Flown 50 hours command or PICUS on geophysical survey in the contracted aircraft type; and,
    - Completed 10 hours command or PICUS in the contracted aircraft type conducting geophysical operations within the preceding 90 days or successful completion of a geophysical line check of at least two hours (excluding ferry time) within the preceding 90 days.
7. Define the minimum personal protective equipment (PPE) for pipeline survey operations and provide all occupants involved with the appropriate PPE.
8. Document for all other survey operations, LIDAR, bird mammal surveys, etc. flight crew training meets SGRAO FOR 04.01- 04.03 requirements with the exception of "recent experience" requirements, and have the following apply:
    - Pilots have completed 50 hours in Command patrol survey time in the previous six months; and
    - Pilots have completed a minimum of 10 hours on the contracted aircraft type conducting survey operations within the preceding 90 days or has successfully completed a survey line check within the preceding 90 days.

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9. Implement flight and duty time limitations for survey operations:
    - Single pilot operations:
        - 5 hours per day on actual survey (transit time excluded); and
        - 34 hours total in any consecutive 7 days (inclusive of transit time).
    - Two pilot operations:
        - 7 hours per day on actual survey (transit time excluded); and
        - 34 hours total in any consecutive 7 days (inclusive of transit time).
10. Verify that provisions for Search and Rescue (SAR) during survey operations are in place to cover the area of operations in conjunction with Shell Technical Authority – Air Transport (TA/1).

## GUIDANCE

1. Aircraft Operators contracted for geophysical survey flying should be members of International Airborne Geophysics Safety Association (IAGSA) which gives guidance on documented procedures. If contractors are not members, documented procedures for Aerial Survey typically include :
    - Cockpit procedures.
    - Crew responsibilities.
    - Standard callouts.
    - Sterile cockpit procedures.
    - Weather minima.
    - Procedures and training for inadvertent entry into cloud.
    - Procedures and training to perform “unplanned landings” for helicopters.
    - Optimum safe operating heights.
    - Traffic deconfliction.
    - Use of a serviceable transponder in all operational environments.
    - Low level operation and Restricted areas; and
    - Flight Following.
2. IAGSA provides a comprehensive risk assessment tool specifically for geophysical survey purposes, a satisfactory review using this tool would normally satisfy risk analysis requirements. If this is not in place, a risk analysis should be provided by the Aircraft Operator prior to the commencement of any survey should typically cover, but is not limited to, the following:
    - Terrain relief and vegetation.
    - Aircraft type.
    - Aircrew composition and flight and duty times.
    - Prevailing weather conditions.
    - Anticipated density altitude.
    - Pilot experience and recency.
    - Planned flight speed.
    - Bird strike avoidance.
    - Fuel provision and management.
    - Certified non-standard modifications.
    - Airborne communications including flight following; and.
    - Coordinated Search and Rescue (SAR) provisions.
    - Refer to **SAF 02.00** Safety Risk Management

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3. No further guidance
4. No further guidance
5. No further guidance
6. Manipulation of the flight controls at survey height by a co-pilot should be restricted to those flights where the aircraft captain is an approved check and training or supervisory captain.
7. Based on the risk assessment in requirement 2 above and any national regulations, personal protective equipment typically consists of the following:
    - A flying helmet meeting industry safety standard – Geophysical, low level, helicopters.
    - Non-synthetic or fire blocked/retardant trousers and shirt.
    - Cotton undergarments.
    - Appropriate work boots or shoes.
    - Life jackets and immersion suits depending on water temperatures if flight is outside safe auto-rotative/gliding distance from land; and
    - A personal emergency locator beacon
    - See also - **FOR 07.03** Equipment Specification – Survival Equipment.
8. No further guidance.
9. No further guidance.
10. No further guidance.

## REFERENCES

TBC

## RELATED INCIDENT

TBC

## SHELL AIRCRAFT GENERIC BOWTIE REFERENCE

TBC

## IOGP REPORT REFERENCE

- R590 requires contractors to be members of IAGSA and follow their Safety Manual. There is no specific reference for a separate Operations Manual for Geophysical Operations. R590 implies the contractor follows the IAGSA Safety Manual, but this manual permits the IAGSA Member to deviate from this manual at their discretion by simply filing a "Notification of Differences". R590 does not specify a requirement for the provision of SAR. R590 has specific flight times for Pilot flight times which, except for two pilot operations, may be stricter.(R590 daily limits do not include transit time).

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# TABLE OF CONTENTS

## FAC 03.01 Flight Scheduling

### MANDATORY REQUIREMENTS

**The Service Provider is Accountable for Requirement 1:**

1. Implement a flight scheduling process to meet company programme requirements and communicate them to the Aircraft Operator.
    - Flights are programmed with adequate lead time to allow the Aircraft Operator to effectively plan for scheduled Aircraft maintenance;
    - A process is in place to accommodate Last Minute Changes to the schedule, passenger or cargo requirements;
    - Passenger travel (offshore etc.) is authorised by a nominated supervisor;
    - Information is provided to scheduled passengers on the limits to baggage weight and size and all restricted/prohibited items;
    - A risk assessment is conducted by the Aircraft Operator before the carriage of any external loads and is accepted by the relevant Shell Technical Authority - Air Transport (TA/1); and,
    - An up-to-date list of approved helidecks, heliports and/or aerodromes is available to, and used by the schedulers or planners, and includes any operational restrictions in place at those locations.

### GUIDANCE

1. Where overlapping responsibilities exist at a passenger processing facility, an interface document should be developed, implemented and the interfaces audited to ensure the delivery of the service is in accordance with company and national regulatory requirements. Where there is a shared agreement in place, the management of delays and which company has priority when flights re-commence needs to be agreed with sharing partners and documented.

### REFERENCES

Shell:

1. HSSE & SP Control Framework - Air Transport Manual.
2. HSSE & SP Control Framework – Managing Risk Manual.
3. HSSE & SP Control Framework – Personal Safety Manual-Business Travel.

### RELATED INCIDENT

Terms in green are included in the **SGRAO Glossary**.
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## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

- Bowtie 02 Air Transport (RW) / Loss of control during landing/take-off.

## IOGP REPORT REFERENCES

- IOGP 690 OHRP, 690-3 Support, 10. Manifests

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## FAC 03.02 Passenger Handling Areas

### MANDATORY REQUIREMENTS

**The Service Provider is Accountable for Requirements 1-5:**

1. Provide passenger and cargo handling facilities appropriate to the scale and duration of the Air Transport operation.
2. Designate clearly-defined onshore passenger secure holding areas for both incoming and outgoing passengers and cargo.
    - Passengers and cargo enter the secure holding area after completion of the passenger screening and security process (FAC 03.05); and,
    - Passengers leaving a secure holding area undergo security screening again prior to re-entering the holding area.
3. Conduct and document facility risk assessments (RA) on the passenger and cargo handling facilities for Health and Security.
4. Develop and implement a passenger and cargo handling facilities Medical Emergency Response (MER) plan.
5. Provide information about aircraft safety and local procedures in designated passenger waiting areas.

### GUIDANCE

1. The Service Provider should obtain the agreement of the relevant Shell Technical Authority – Air Transport (TA/1) on the range of facilities to be provided prior to the commencement of flights.
2. The designated passenger waiting area may serve as a viewing room for video safety briefings and provide an area to weigh and manifest all outgoing passengers, baggage and cargo.

   The onshore passenger holding area should also include:

    - A designated area for the passenger and cargo check-in process, i.e., for weighing and manifesting all outgoing passengers, baggage, and cargo on calibrated scales and security screening;
    - A dedicated and secure waiting area for outbound passengers that separates them from incoming passengers;
    - A designated area for the display of written and graphic information related to aircraft safety and local procedures;
    - A viewing room for video safety briefings (which may be the same area as that used for the display of information);
    - If applicable, a changing room for the donning of immersion suits (which may also be the same area as the video room); and,
    - A baggage collection area for incoming passengers.

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3. Facility health and security risk assessments should be conducted in conjunction with relevant Shell Technical Authority – Air Transport (TA1):
    - Security screening personnel are trained on the operation of screening equipment as mandated by National Regulation or Service Provider's security plan;
    - Emergency exits are available and easily identified with appropriate security provisions for both landside and airside exits; and,
    - Heath Risk Assessment (HRA) is carried out to determine level of cover required on site.
4. No further requirements.
5. Information can be provided in several ways, either as:
    - Written and graphical material (posters and handouts);
    - Computer monitor screens; and,
    - Announcements using a public-address system.

## REFERENCES

Shell:

1. HSSE & SP Control Framework - Air Transport Manual.
2. HSSE & SP Control Framework – Managing Risk Manual.

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

- Bowtie 01 Air Transport (FW) / Loss of control during landing/take-off
- Bowtie 02 Air Transport (RW) / Loss of control during landing/take-off

## IOGP REPORT REFRENCES

- IOGP OHRP, 690-3, 2. Onshore passenger holding areas

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## FAC 03.03 Passenger Weight and Size

### MANDATORY REQUIREMENTS

**The Service Provider is Accountable for Requirements 1-7.**

1. Use actual passenger weight values (including hand-carried baggage, personal survival equipment and personal belongings) for all helicopters and for aeroplanes having a seating capacity of 19 or fewer seats, and all checked baggage is manifested using actual weights.
2. Calibrate passenger and cargo weighing scales as per manufacturers recommended intervals.
3. Document control procedures for the use of standard passenger and baggage weights on aeroplanes having a maximum seating capacity of 20 or above.
4. Seat passengers, on offshore helicopters, no more than one seat from a push out window or an emergency exit.
5. Passengers seated at an emergency exit in aircraft are physically able and willing to operate the exits when instructed by aircrew in the event of an emergency;
6. Prohibit the carriage of passengers on offshore helicopters who are unable to pass through the exit window while dressed in the necessary flight equipment (survival suits, lifejacket etc.):
    - A means is in place to identify passengers that will be required to be seated next to appropriate exits, as described in the “Step Change for Safety XBR process”; and,
    - Ground Handling and Helideck staff involved in passenger seat attribution/verification during boarding phase are aware of the XBR process.
7. Prohibit the use of seat harnesses/seat belt extensions, unless certified by the aircraft manufacturer.

### GUIDANCE

1. A procedure is in place for situations where calibrated scales are temporarily unavailable, and the following standard weights are used for aeroplane and helicopter passengers, when calibrated scales are temporarily unavailable, if authorised by the National Aviation Authority (NAA). Recommended standard weights:
    - Males 98kg Female 80kg;
    - Hand baggage carried in the passenger cabin of aeroplanes at 6kg per passenger, otherwise at actual weight;
    - The weight of survival suits as actual weight or as 7kg per passenger; and
    - The weight of lifejacket as actual weight or as 3kg per passenger – this is not required if already included as aircraft equipment in the Aircraft Prepared for Service (APS) weight.
2. No further guidance.
3. When standard passenger weights are used on aeroplanes, actual weights are surveyed routinely to check that the use of standard weights provides a safety margin over actual weights. When a survey shows an inadequate safety margin, either actual weights are used, or a realistic factor is applied to the standard weight.
4. No further guidance;

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5. No further guidance;
6. Alternative processes can be applied to determine if a passenger cannot fit through an exit window. Typically these are, Window templates that are representative of the actual push-out windows on the helicopter type in use are applied to any passenger assessed as being close to, or over the size of the available emergency exit. Some types may require a range of templates that will determine specific seat rows for passengers of different size. Passengers that are unable to pass through the template, when dressed in flight equipment (survival suits, lifejacket etc) are refused permission to fly.
7. No further guidance.

## REFERENCES

- Step Change in Safety: **https://www.stepchangeinsafety.net/workgroups/helicopter-safety/**
- EASA AMC1 SPA.HOFO.165(h) Additional procedures and equipment for operations in a hostile environment - Emergency Exits and Escape Hatches
- RAF IAM (Report No.528) and University of Loughborough Report on body size for the Joint Aviation Authorities (JAA) in 2001
- UK CAA CAP 562 Civil Aircraft Airworthiness Information and Procedures.

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFRENCES

- R590 differentiates the use of actual or standard weights by aircraft weight (5,700kg) and not by the number of seats. IOGP OHRP Section 690-3, 4. Passenger and baggage weights, 5. Passenger handling.

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## FAC 03.04 Manifests

### MANDATORY REQUIREMENTS

**The Service Provider is Accountable for Requirements 1-5:**

1. Raise and complete passenger manifests for each flight, developed from the published flight schedule, which contain, as a minimum:
    - Aircraft registration;
    - Flight number (if applicable);
    - Date of Flight;
    - Destination;
    - Passenger name;
    - Passenger company affiliation;
    - Passenger actual weight;
    - Baggage weight for each passenger;
    - Cargo weight;
    - Authorised Dangerous Goods/Hazardous Materials; and
    - Any additional National Aviation Authority (NAA) requirements.
2. Each piece of cargo offered for transport by air is weighed separately and recorded in the manifest and the contents of each piece of cargo is verified against the manifest by its packing list or by visual inspection.
3. Use manifests which are hand-written or generated from a computer-based manifesting system. Where a hand-written manifest is used, a copy is left with a responsible person on the ground who retains it until the flight is completed.
    - Manifests are closed for changes and passed to the Flight Crew with adequate time to complete calculations of fuel loads, aircraft performance and centre of gravity;
    - Manifests are signed by a crew member to confirm acceptance of the document. The contents of each piece of cargo is verified by its packing list or by visual inspection of the cargo itself;
    - A minimum of three copies are made:
        - One to be filed and left at point of departure;
        - One for use by the crew in-flight; and,
        - One to be left at destination.
4. Generate a single consolidated manifest, where a flight involves multiple sectors, for each sector and provide it to the crew.
5. Incorporate, any last-minute changes in passenger and cargo details, and revise the manifest accordingly prior to departure.
6. Verify actual passenger names against the manifest.

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## GUIDANCE

1. Dangerous Goods/Hazardous Material cargo are properly packaged and accompanied by the Dangerous Goods/Hazardous Material paperwork required by the NAA.
2. No further guidance.
3. An accurate manifest retained at the point of departure provides important information for an effective response to an aircraft emergency.
4. No further guidance.
5. The Pilot-in-Command communicates any last-minute changes to a responsible party with instructions to retain a copy of the altered manifest until the flight has been completed
6. Pilots and/or designated personnel check actual passenger names against the original booking to verify that only authorised passengers are carried.

## REFERENCES

- ICAO Annex 6 Vol 3.
- ICAO Annex 9.

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

TBC

## IOGP REPORT REFERENCE

- IOGP OHRP 690-3, 10. Manifests

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## FAC 03.05 Passenger Screening and Security

### MANDATORY REQUIREMENTS

**The Service Provider is Accountable for Requirements 1-5:**

1. Implement a screening process for passengers, baggage and cargo, both out and inbound.
    - Passengers present a locally-approved form of photo identification.
    - Information is provided to passengers on restricted, prohibited and dangerous goods restricted items:
    - Undeclared Dangerous Goods are identified and removed or correctly consigned; and,
    - Additional items restricted by the Shell Business Unit are screened and removed.
2. Provide Dangerous Goods training at a level determined by the assigned task.
    - Persons processing and manifesting Dangerous Goods for Air Transport receive training in accordance with national regulation.
    - Persons handling baggage receive Dangerous Goods awareness training at a minimum; and,
    - Track training in a recognised system.
3. Implement for all offshore helicopter flights:
    - Passenger emergency and survival training is checked for all flights.
    - Passengers who are not appropriately trained to travel offshore by air are refused carriage unless a waiver is given. A record of all waivers given is kept and the process is subjected to internal or self-assurance checks.
    - Non-HUET trained passengers travelling with a waiver are identified visually to ensure they are not be seated between an emergency exit and a passenger in date for HUET training.
    - Enhanced health and security screening procedures are in use, including checking that passengers have a valid medical certificate (if applicable).
    - The use of plastic bags as baggage containers is prohibited.
    - Carry-on baggage is not permitted in the helicopter passenger cabin.
4. Conduct drug and alcohol screening using trained personnel in accordance with National regulations and Company requirements:
    - Personnel under the influence of alcohol or non-prescription drugs are prohibited from boarding any aircraft; and
    - Check-in and Security staff are trained to recognise the signs of substance abuse and alert their management for appropriate action to remove the passenger from the flight.
5. Implement site security controls and procedures appropriate to the assessed security risks, using security personnel that meet training requirements as mandated by Shell, National Aviation Autority (NAA) or Service Provider's security plan.

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## GUIDANCE

1. A process should be in place to verify the identity of passengers prior to boarding, ensure they meet safety training, medical or other currency requirements, search for restricted, prohibited items (prohibited either in-flight or at the destination) and dangerous goods;

    - For undeclared Dangerous Goods – See – see **FAC 03.06**;

    Each BU should develop a tailored list of items which are restricted and/or prohibited for carriage on aircraft or to offshore installations, which should be shown to each passenger, items listed below should be considered:

    - Adhesives;
    - Aerosols;
    - Alcohol of any kind (offshore flights);
    - Canned drinks of any kind;
    - Cigarette lighters;
    - Drugs (save on prescription) - Prescription drugs may have to be surrendered at check-in for safe-hand carriage, record and re-issue on installation; with a similar procedure for passengers returning onshore;
    - Explosives, fireworks;
    - Firearms/Ammunition;
    - Flammable gas or liquid, Tear Gas, CS Gas;
    - Magnetic materials;
    - Matches of any kind (offshore flights);
    - Oils and greases;
    - Paints and solvents;
    - Poisons, weed killers, pesticides and insecticides;
    - Radio-active materials;
    - Radio, cassette and disc players, unless batteries are removed;
    - Weapons - including knives with a blade longer than 3" - Knives which are tools of trade (e.g. chefs and divers) maybe declared at check-in and should not to be carried in hand carried bags on the aircraft;
    - Wet Batteries;
    - Wet Fish;
    - Weapons and other prohibited items are not carried on aircraft; and,
    - Items that are be carried in checked baggage, are controlled.

2. No further guidance.
3. Waivers should be tracked in formal BU process.
4. Procedures for handling passengers who were denied boarding for a failed Drug and/or Alcohol screening should be in use.

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5. The aircraft operator has a process to conduct inbound, onshore security checks in accordance with any local regulations or company contractual requirements. The passenger, baggage and cargo screening process covers both outbound and inbound flights (e.g.: both onshore and offshore screening is conducted).
    - Security screening process can identify and remove prohibited items and undeclared dangerous goods;
    - Site controls and physical infrastructure to manage the airside/landside division (ICAO Annex 17) and to prevent unauthorised personnel accessing airside locations and other restricted areas;
    - Use security screening equipment e.g. walk-through metal detectors, hand wands and X-ray equipment for passenger, baggage and cargo screening appropriate to the security risk assessment;
    - Enhanced screening should be based on an elevated risk level for risks identified in the Security Plan and aligned with the National regulations as well as local company specific requirements;
    - Security screening equipment should be fit for purpose in terms of average expected size of passengers, baggage and cargo; and,
    - Where possible, authorised security staff should then carry out a thorough search of personal baggage in the presence of the passenger, before moving it to the loading area. Body searches should be made when the flight is called for boarding and prior to the issue of immersion suits (offshore flights).

## REFERENCES

Shell:

1. HSSE & SP Control Framework - Air Transport Manual
2. HSSE & SP Control Framework – Managing Risk Manual
3. HSSE & SP Control Framework – Personal Safety Manual-Business Travel

## RELATED INCIDENT

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

## IOGP REPORT REFERENCE

- IOGP OHRP 690-3, 1.Passenger check-in, 3.Alcohol and drugs

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## FAC 03.06 Passenger, Baggage and Cargo Handling

### MANDATORY REQUIREMENTS

**The Service provider is Accountable for Requirements 1-7:**

1. Develop and implement procedures to prevent injury to passengers and to those personnel managing the handling of passengers, baggage and cargo.
2. Each piece of cargo offered for transport by air is weighed separately and recorded in the manifest and the contents of each piece of cargo is verified against the manifest by its packing list or by visual inspection.
3. All passengers are escorted to and from the aircraft when operating on an aerodrome or heliport apron area by personnel trained on the danger areas for the specific aircraft type.
4. Apply controls to limit the hazard presented by certain types of cargo and baggage, by developing and implementing a policy on items restricted for carriage by air and communicating this to check-in staff and passengers, which:
    - Prohibits carry-on baggage in helicopters;
    - Directs all carry-on baggage in aeroplanes to be stowed allowing clear access to emergency exits;
    - Ensures that any checked-in baggage and cargo carried in the passenger compartment on aeroplanes is:
    - Adequately secured using approved cargo nets, or tie-down straps,
    - Does not obstruct normal or emergency exits, and all exits remain available for use by passengers.
5. Train and authorise personnel to secure and remove baggage and cargo, only they are permitted to load, secure and/or remove cargo and baggage.
6. Carry dangerous goods in accordance with ICAO Annex 18 "Safe Transport of Dangerous Goods by Air" or IATA Dangerous Goods Regulations, or other National Aviation Authority (NAA) requirements that regulate the air transportation of Dangerous Goods;
7. Provisions for Dangerous Goods carried by passengers or crew and limitations for Portable Electronic Devices (PED), batteries, including lithium metal or lithium ion cells or batteries, and specified ignition sources are in place. This includes spare or loose batteries.

### GUIDANCE

1. Preventing hazards to aircraft from baggage and cargo handling includes:
    - Passengers are seated, and baggage and cargo are loaded in accordance with the aircraft weight and balance limits;
    - Baggage and cargo is loaded in accordance with the aircraft floor loading, baggage/cabin compartment weight, and baggage ramp/door limits;
    - Approved baggage and cargo restraints are used to secure these items where required; and,
    - Aircraft loading/handling equipment is fit for purpose and approved by the aircraft operator.
2. No further guidance.
3. No further guidance.

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4. Passengers seated at an emergency exit in aircraft should be physically able and willing to operate the exits when instructed by aircrew in the event of an emergency. Where physical separation is possible, and emergency egress is not impeded, the mixing of passengers and baggage or cargo in the passenger cabin on helicopters, may be approved by the Shell Technical Authority, (T/A1). This should also be approved by the operator and only passengers associated with the cargo may fly, e.g. downhole tooling team.

5. No further guidance.
6. Where the carriage of Dangerous Goods by the aircraft operator is authorised, procedures comply with the ICAO Technical Instructions or the IATA Dangerous Goods Regulations and with local regulatory requirements. These include the training of relevant ground staff and the provision of the correct documentation for all DG shipments;
    - Where dangerous goods are not carried, Dangerous Goods Awareness training, compliant with local regulatory requirements, is in place for all relevant ground staff at least every 2 years to prevent the carriage of undeclared dangerous goods that may be found in passengers' baggage and consigned freight;
    - Dangerous Goods are only carried by air when the Aircraft Operator has obtained written permission, approval or an exemption from the National Aviation Authority (NAA);
    - The Aircraft Operator documents procedures for all aspects of transporting dangerous goods; and,
    - A Notice to Captain (NOTOC) and/or shippers declaration for dangerous good is issued whenever dangerous goods or other special items are loaded onto the aircraft.
7. The provisions for Dangerous Goods carried by passengers or crew and limitations should cover:
    - Check-In procedures, including passenger declarations;
    - Forbidding charging PED in-flight;
    - Mitigation measures – Flame/Smoke Bag etc.;
    - E-Cigarettes (if permitted) must have batteries removed;
    - Checked in PED must be switched off; and,
    - No transport of loose lithium batteries.

## REFERENCES

Shell:

1. HSSE & SP Control Framework - Air Transport Manual
2. HSSE & SP Control Framework – Managing Risk Manual
3. HSSE & SP Control Framework – Competence Manual

## RELATED INCIDENT

- Air Cargo 747-400 BCF Crash at Bagram, Afghanistan April 29, 2013

## SHELL AIRCRAFT MODEL BOWTIE REFERENCE

- Bowtie 01 Air Transport (FW) / Loss of control during landing/take-off
- Bowtie 02 Air Transport (RW) / Loss of control during landing/take-off

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## IOGP REPORT REFERENCES

- 590 does not prohibit the use of plastic bags.
- 590 does not prohibit carry-on luggage in helicopters.
- IOGP OHRP Section 690-3, 8. Cargo - Weighing and documentation, 9. Cargo – Dangerous Goods

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