

**Sikorsky S-92A,
G-LAWX**

**Shipston-on-Stour,
Warwickshire**

14 October 2019

Serious Incident

Investigation Synopsis

On an approach to a private landing site in conditions of reduced visibility shortly before night, the pilots became uncertain of their position and the helicopter descended to within 28 ft of rising terrain close to a house. During the subsequent emergency climb at low indicated airspeed, engine torque increased to 131% and the pitch attitude of the helicopter was unstable. The helicopter made another approach to the landing site and landed without damage or injury to the occupants.

The investigation identified the following factors:

- Standard operating procedures for altitude alert setting, stabilised approach criteria and crew communication were either absent or not effective,
- a strong desire as a customer-facing director not to inconvenience the client, which was potentially in tension with his obligation as the commander to ensure a safe flight,
- uncertainty about the Rules of the Air when landing, and
- attitudes, behavioural traps and biases likely to have contributed to the Occurrence.

The circumstances of this serious incident indicate the need for greater awareness of the hazards of operating in degraded visual conditions and highlight the potential safety benefits of Point-in-Space approaches at landing sites. The AAIB has made eight Safety Recommendations in these areas.

Safety Recommendation 2021-025

Justification

The evidence of this serious incident, and the other occurrences to which CAP 1864 refers, indicates that the effect of the regulations when landing is not well understood, and may be causing pilots to act unsafely.

Therefore, the following safety recommendation was made:

Safety Recommendation 2021-025

It is recommended that the Civil Aviation Authority publish guidance on the meaning and intention of the phase of flight alleviations in UK SERA where detailed as "except for take-off and landing" to better enable pilots to plan and act on minimum height requirements for safe operations.

Date Safety Recommendation made: 11 June 2021

LATEST RESPONSE

Response received: 01 February 2024

CAP2613 was published on 29 November 2023 and as such, the CAA consider that Recommendation 2021-25 is now closed.

CAP2613: Definition of Helicopter Take Off and Landing Phase of Flight (caa.co.uk)

Safety Recommendation Status **Closed**

AAIB Assessment **Adequate**

Action Status **Planned Action Completed**

RESPONSE HISTORY

Response received: 03 November 2023

The current exemption in the Standardised European Rules of the Air (SERA) must cover a wide number of different approach and departure scenarios and so there is no "one size fits all". In consultation with the Civil Aviation Authority (CAA) Rotary Wing Section and other subject matter experts, the CAA Guidance and Interpretation for Helicopter "Take off and Landing" is as follows:

Helicopter "Take off and Landing" - The CAA interprets this to mean the final stages of an approach of the initial stages of a departure, whereby the aircraft is in a stable flight configuration at or below 500 ft agl and the area surrounding the final approach and takeoff area is clearly visible.

This text, together with applicability, has been placed on the CAA SAFER (Safety recommendation, Analysis, Follow-up, Evaluation and Reporting) webpage; a Civil Aviation Publication is being produced which when published will close this action item.

AAIB Assessment – Adequate Open

Response received: 15 February 2023

An amendment to the applicable UK SERA section remains under consideration, but the current timelines associated with such a change is significant. This has resulted in a preference for a publication describing the 'CAA Interpretation' of the Part SERA requirements pertinent to take off and landing phases. The CAA intends to publish guidance on its interpretation of 'except for take-off and landing' in Q2 2023. This will aid the helicopter industry with a better understanding of its compliance with SERA 5005, until such time as any change to regulation is considered necessary.

AAIB Assessment – Partially Adequate Open

Response received: 07 October 2022

The intention of the alleviation is not to allow pilots who become visual with a landing site at a considerable distance to at that point descend below the height normally permitted. Equally, on take-off aircraft are expected to climb directly to a height that complies with the minimum height regulations.

The review of the SERA regulations continues within the working groups and changes are expected; the 'except for take-off and landing' statement is embedded within the regulation and at this stage there is no final recommendation. The lack of coherent layout of the overall regulatory requirements causes some interpretational difficulties, and a key area being addressed is wholesale simplification of this part of SERA.

The final outcome of this review is then likely to take considerable time for regulation change due to the legal process requirements, though the CAA will take a view on publicising the intent of any regulatory proposal in advance once we get to that stage.

AAIB Assessment – Not Adequate Open

Response received: 17 June 2022

The intention of the alleviation is not to allow pilots who become visual with a landing site at a considerable distance to at that point descend below the height normally permitted. Equally, on take-off aircraft are expected to climb directly to a height that complies with the minimum height regulations.

Therefore, consideration has been given to tying the alleviation to visibility, e.g., 'at a distance not greater than minimum permitted visibility applicable to the flight'.

There are a number of implications to this proposal relating to e.g., IFR approaches and emergency service operations - police, HEMS, SAR. An alternative might be the inclusion of 'in accordance with normal aviation practice' which was used in some of the low-flying rules in the UK Rules of the Air Regulations prior to SERA.

Two working groups (London Helicopter Routes working group (CAA) and Helicopter Safety Review working group (CAA and Industry)) are currently looking at various areas of VFR helicopter operations. Included in these is a review of the current VFR minima; they are expected to report during summer 2022.

Any of the foregoing proposals would require a stakeholder impact assessment and consultation. In the event of a regulatory change being recommended this would have to be included in the parliamentary timetable. We will provide an update on progress in Q3 of 2022.

AAIB Assessment – Partially Adequate Open

Response received: 23 December 2021

An internal working group consisting of Flight Operations policy specialists and helicopter Flight Operations Inspectors is planned to complete this review and confirm action plan by the end of February 2022.

AAIB Assessment – Partially Adequate Open

Response received: 08 September 2021

The CAA accepts this recommendation. A review of available guidance for the meaning and intention of the phase of flight alleviations in UK SERA (where detailed as "except for take-off and landing") will be undertaken and, if appropriate, suitable guidance will be issued.

AAIB Assessment – Partially Adequate Open

Safety Recommendation 2021-026

Justification

The operator had not defined stabilised approach criteria in its OM.

Therefore, the following safety recommendation was made:

Safety Recommendation 2021-026

It is recommended that Starspeed Ltd specify in its operations manual stabilised approach criteria for visual approaches, including at off-aerodrome landing sites.

Date Safety Recommendation made: 11 June 2021

LATEST RESPONSE

Response received: 13 September 2021

Summary

Taking the above into account, Starspeed cannot currently see a way of creating standard criteria for stabilised approach mandatory by day or by night that meet all the different safety and risk management needs. Crews will be instructed that where a landing site permits the use of the standard day gate criteria, (or prescribed stabilised night approaches) they will use them. At the very least, even if wings level cannot be achieved, by 500' agl with 0.5nm to run, landing checks will be complete and a steady, decelerative speed will be established to meet LDP, (wings level) at the appropriate point. This guidance will be written into the Part A, Section 8 of the OM.

Safety Recommendation Status Open

AAIB Assessment Partially Adequate

Action Status Planned Action Ongoing Update Due 31 March 2022

Feedback rationale

The response does not completely satisfy the intent of the Safety Recommendation because it does not include action to specify in its operations manual stabilised approach criteria for visual approaches, including at off-aerodrome landing sites, except in the specific circumstances described. This does not appear consistent with the guidance to which the AAIB report refers and which includes a consideration of onshore procedures. There appears to be more scope for defining practical stable approach criteria than envisaged by the operator's response.

The AAIB invites the operator to re-examine the issue and to advise the AAIB of progress in its response by 31 January 2022. (EU Regulation 996/2010 article 18 refers).

RESPONSE HISTORY

N/A

Safety Recommendation 2021-027

Justification

The existence of a PinS approach to the LS would have afforded the pilots a more robust alternative means to make an approach in the marginal conditions that were experienced. CAP 1864 identified that PinS approaches provide the opportunity to meet the needs of onshore helicopter IFR operations but did not propose any action to address the current lack of them.

Therefore, the following safety recommendation was made:

Safety Recommendation 2021-027

It is recommended that the Civil Aviation Authority encourage the development and deployment of Point-in-Space operations at landing sites.

Date Safety Recommendation made: 11 June 2021

LATEST RESPONSE

Response received: 03 November 2023

CAP2520 - Policy and Guidance for the Implementation of Helicopter Point in Space Operations in the UK was published in May 2023. This document aims to present all factors helicopter operators must consider when introducing Point-In-Space (PinS) procedures.

Almondsbury Helicopter Airbase, Strensham Airbase, Henstridge Airfield, Royal Sussex County Hospital and King's College Hospital were all selected as successful applications of the Global Navigation Satellite System (GNSS) Programme, now in its third phase and run jointly by the UK Civil Aviation Authority and Department for Transport. Funding has also been secured to support these applications as blue light landing sites.

The HEMS Operators principally responsible for operating to the aforementioned landing sites are in the process of evaluating any necessary Management of Change to proceed in accordance with CAP2520.

The safe introduction of PinS, initially with Air Ambulance operations, is understood to be a medium to long term project for those involved. Therefore, the CAA consider that the original recommendation to "encourage the development and deployment of Point-In-Space operations at landing sites" has been met and will continue to work with both DfT and Industry to progress the safe introduction of PinS.

Safety Recommendation Status Closed

AAIB Assessment Adequate

Action Status Planned Action Completed

RESPONSE HISTORY

Response received: 15 February 2023

A joint DfT/CAA invitation was sent out in the autumn of 2022 for eligible parties to register their interest for joining the third phase of GNSS implementation in the UK. This initiative to expand the number of GNSS instrument flight procedures is supported by DfT funding up to 75% of the project costs. This was circulated to 52 small airfields and a decision was made to extend the programme to include helicopter landing sites for Air Ambulance emergency services and consequently, the UK HEMS operators were contacted.

The result is that a mixture of fixed wing and rotary sites had been chosen by December 2022, and the rotary sites include current helicopter landing sites and hospital sites.

An application is ongoing for PinS approaches to two sites. A new CAP - Guidance for the implementation of Point-In-Space Helicopter Operations in the UK is currently nearing or at the final draft stage. An extract below:

“The CAA considers that due to the nature of PinS and their safety implications, the implementation of such procedures in the UK should be scaled. Consequently, only applications to licensed aerodromes are considered to date with the exception for “Blue Light” services operating to/from unlicensed landing sites. Following the Post Implementation Review process, the CAA will consider expanding PinS applications to all types of operations serving all categories of landing sites.”

AAIB Assessment – Adequate Closed

Response received: 17 June 2022

The framework that will safely facilitate the use of Point-in-Space (PinS) operations continues to be developed. Flight Operations requirements and processes are already largely in place, the main focus remains on safeguarding the approaches and where the source data will be maintained. It is expected that by Q3 2022 procedures for hosting the procedures (expected to be in the AIP) and various charting requirements will have been confirmed. A parallel workstream producing guidance for PinS procedure implementation, and CAA website implications, is also planned to report by Q3 2022 enabling us to provide an update before the end of 2022.

AAIB Assessment – Partially Adequate Open

Response received: 08 September 2021

The CAA accepts this recommendation. The CAA recognises safety and operational advantages are possible by developing Point-in-Space operations and will work with industry to encourage deployment through the Onshore Safety Leadership Group. However, the CAA is also cognisant that it is up to industry (operators and landing site owners) to identify most appropriate PinS applications, and that there is currently an industry cost burden in the development of such procedures which is an impediment to wider availability.

AAIB Assessment – Adequate Closed

Safety Recommendation 2021-028

Justification

CAA Paper 2007/03, AIC Pink 137/2019, CAA Safety Notice SN-2019/007, CAP 1145 and CAP 1864 describe the broader hazards of operating in degraded visual conditions but do not offer guidance for managing them.

Therefore, the following safety recommendation was made:

Safety Recommendation 2021-028

It is recommended that the Civil Aviation Authority revise its guidance on helicopter flight in degraded visual conditions to include further information on managing the associated risks.

Date Safety Recommendation made: 11 June 2021

LATEST RESPONSE

Response received: 17 June 2022

Following a review by the Flight Operations Inspector (Rotary Wing) team it is clear there already exists significant research material, associated papers and guidance documents relating to this subject, most of which remain relevant and valuable. However, the existence of this material may not be as widely known as it could be. Therefore, a SkyWise notification will soon be issued detailing the available information and guidance and the reason for the reminder. Flight Operations have separately advised account managers and safety managers by mail of the SkyWise and its content; it will be recommended that they include the subject on the agenda of their next safety meeting. Flight Operations Inspectors and Inspecting Officers on both the Air Operator Certificate and Flight Crew Licensing & Approved Training Organisation oversight teams will raise the topic as a discussion point at the next audit or inspection. This topic has also been raised with the Onshore Safety Leadership Group as safety discussion topic for this year.

Safety Recommendation Status Closed

AAIB Assessment Adequate

Action Status Planned Action Completed

RESPONSE HISTORY

Response received: 08 September 2021

The CAA accepts this recommendation and will conduct a review of its current guidance on helicopter flight in degraded visual conditions with a view to providing enhanced information on the importance of the management of associated risks as exemplified through elements of this serious incident.

AAIB Assessment – Partially Adequate Open

Safety Recommendation 2021-029

Justification

The S92 involved in this occurrence was fitted with a system to alert the pilots when the helicopter descended below a selected minimum barometric altitude. Not all helicopters are fitted with this system. No barometric altitude alerts were recorded during the flight, indicating that the barometric alert value was set above or below all the altitudes flown. There was no SOP for the value which should be set when operating under VFR. Setting alerts at pre-determined en route and approach minima for visual flight provides an additional barrier to inadvertent descent below those minima

Therefore, the following safety recommendation was made:

Safety Recommendation 2021-029

It is recommended that Starspeed Ltd describe in its operations manual for the Sikorsky S92 helicopter the criteria for setting barometric altitude alert values at each stage of a flight.

Date Safety Recommendation made: 11 June 2021

LATEST RESPONSE

Response received: 13 September 2021

For onshore rotary craft, the RADALT provides the only indication of actual terrain separation.

However, the Bar Alt, (on aircraft with the ability to set a Bar Alt alert) shall have the relevant MSA pre-set. When flying VFR or IFR in the cruise, the pre-setting of MSA will provide a known altitude by which the aircraft can fly to and achieve safe terrain separation.

This will be re-set in the event of an instrument approach when the applicable MDA will be used in accordance with Operations Manual Part A, Section 8, Table 8.14.9.

Safety Recommendation Status Closed

AAIB Assessment Adequate

Action Status Planned Action Completed

RESPONSE HISTORY

N/A

Safety Recommendation 2021-030

Justification

The operator's external crew resource management training provider covered assertive communication and intervention using the PACE model, but the operator had not implemented the process in its OM. This occurrence indicates that the co-pilot had the greatest difficulty challenging the commander in those areas not covered by a formalised challenge procedure.

Therefore, the following safety recommendation was made:

Safety Recommendation 2021-030

It is recommended that Starspeed Ltd specify in its operations manual a formal process for crew members to monitor, escalate concerns and, if necessary, take control during a flight.

Date Safety Recommendation made: 11 June 2021

LATEST RESPONSE

Response received: 13 September 2021

The Ops Manual at Amendment 4 has been updated to better describe the procedure and requirements.
Section 8.14.8.5 – Go-Around process
Section 8.14.8.8 – Deviation calls

In addition, the training programme defined in Part D now includes specific training items relating to this incident. These changes have already successfully been incorporated in recent Simulator training sessions.

Safety Recommendation Status Open

AAIB Assessment Partially Adequate

Action Status Planned Action Ongoing Update Due 31 March 2022

Feedback rationale

The AAIB acknowledges the action taken to by the operator. The changes to the operations manual described in the response do not completely satisfy the intent of the recommendation because they relate specifically to flight path deviations and not to how crewmembers might escalate concerns more generally. The AAIB invites the operator to explore how it might address the full intent of the Safety Recommendation and to advise the AAIB of its intentions by 31 January 2022. (EU Regulation 996/2010 article 18 refers).

RESPONSE HISTORY

N/A

Safety Recommendation 2021-031

Justification

CAP 1864 noted that pilots will often be subject to pressures – real or perceived – to complete a task, and that these pressures might lead pilots to continue with flights in circumstances where otherwise they would not. It recommended that operators show clear evidence of operational control as defined in AMC1 ORO.GEN.110 (c), ensuring that there is a clear tasking process separating the customer and the flight crew. The AAIB investigation of G-CRST amongst others, and its discussions with the CAA, indicate that this is a significant area of concern in the onshore helicopter industry requiring prompt safety action.

Therefore, the following safety recommendation was made:

Safety Recommendation 2021-031

it is recommended that the Civil Aviation Authority ensure that operators show clear evidence within their system for operational control as required by UK ORO.GEN.110 (c), of how the tasking process separates the customer from the flight crew.

Date Safety Recommendation made: 11 June 2021

LATEST RESPONSE

Response received: 03 November 2023

With a positive response from Industry to the release of (Safety Notice) SN2022/005 and the consistent tracking of commercial pressure related (Mandatory Occurrence Report) MORs, the CAA will maintain oversight of how an Operator's tasking process separates the customer from the flight crew. This action is now complete and will form part of Business As Usual.

Safety Recommendation Status Closed

AAIB Assessment Adequate

Action Status Planned Action Completed

Feedback rationale

Safety Notice SN2022/005 refers (not SN2022/015 as stated in the response). The AAIB will refer to SN2022/005 in its classification. (EU Regulation 996/2010 article 18 refers).

RESPONSE HISTORY

Response received: 15 February 2023

The CAA published Safety Notice SN-2022/005, Commercial, Organisations and Client Pressure in Flight Operations, on 18 July 2022, with the purpose of highlighting the risks associated with commercial pressure and the importance of separating the customer from the flight crew when making operational decisions.

Verifying and monitoring the implementation of this Safety Notice has been incorporated into routine oversight activity, and the prevalence of commercial pressure has been considered when assessing operators' safety management systems.

Where identified as a hazard, commercial pressure can be highlighted at entity level and/or sector level, resulting in further engagement/promotion at the various industry forums attended by the CAA.

AAIB Assessment – Adequate Closed

Response received: 07 October 2022

Whilst this incident involved a helicopter, the CAA issued a Safety Notice on the 18th July 2022 (SN 2022/015 Commercial, Organisational and Client Pressure in Flight Operations) to address commercial pressure in general as well as made specific reference to the interaction between the customer and the flight crew which can have a detrimental impact on key operational decisions and potentially lower safety margins.

AAIB Assessment – Not Adequate Open

Response received: 17 June 2022

Whilst this incident involved a helicopter and the recommendation made specific reference to the interaction between the customer and the flight crew, the CAA will be issuing a Safety Notice to address this and other scenarios and types of operations where commercial pressure may be present in Q3 of 2022.

AAIB Assessment – Partially Adequate Open

Response received: 08 September 2021

The CAA accepts this recommendation. The CAA has conducted a Specific Objectives Check (SOC) relating to operational control as required by UK ORO.GEN.110 (c) and other associated Acceptable Means of Compliance and Guidance Materials, a number of observations have been raised with operators to address any shortcomings in their systems. As a result of this recommendation and the observations raised, the CAA is reviewing their guidance to operators. The CAA will also engage with relevant industry groups to promote awareness of, and compliance with, the relevant requirements.

AAIB Assessment – Adequate Closed

Safety Recommendation 2021-032

Justification

The Civil Aviation Authority recognises the benefits of Helicopter Flight Data Monitoring programs but CAP 1864 (Onshore Helicopter Review Report) does not propose action to implement them

Therefore, the following safety recommendation was made:

Safety Recommendation 2021-032

It is recommended that the Civil Aviation Authority assess the safety benefits and feasibility of Helicopter Flight Data Monitoring programmes for onshore helicopter operators conducting commercial operations or non-commercial complex operations and publish its findings.

Date Safety Recommendation made: 11 June 2021

LATEST RESPONSE

Response received: 21 June 2024

During 2024, the OnSLG has so far conducted two meetings, both focussed on its current priority sub groups:

OnSLG ACANS Sub Committee - 14 March 2024

OnSLG HHLS Sub Committee - 20 March 2024

The next full meeting of the OnSLG, due to include Onshore Helicopter FDM as one of its standing agenda items, is currently proposed for Q4 2024.

Safety Recommendation Status Open

AAIB Assessment Partially Adequate

Action Status Planned Action Ongoing Update Due 16 January 2025

Feedback rationale

The AAIB notes that action to address this Safety Recommendation is ongoing, and that an update will be provided following the proposed OnSLG meeting planned for Q4 2024. (EU Regulation 996/2010 article 18 refers).

RESPONSE HISTORY

Response received: 03 November 2023

The (Onshore Safety Leadership Group) OnSLG has placed (Flight Data Monitoring) FDM as a standing agenda item and one of its principal safety initiatives. However, time and resource has been somewhat limited due to priority workstreams in support of Hospital (Helicopter Landing Sites) HLS safety improvements.

The CAA will continue to support OnSLG with its initial data gathering to establish operational usage and differing FDM systems currently being utilised by Onshore Industry. This remains an open item and a further update will be prepared in June 2024, in line with OnSLG other priorities.

AAIB Assessment – Partially Adequate Open

Response received: 15 February 2023

The CAA-facilitated RW Safety seminar in Nov 2022 raised the profile of FDM, its uses and potential limitations. Following this, the Onshore Safety Leadership Group (OnSLG) sponsored a questionnaire to obtain feedback on current use of FDM and perceived barriers for more effective and broader use. The current focus for the CAA and OnSLG is the open actions from CAP 1864 (Onshore Helicopter Review), which did not identify FDM as a workstream; the survey may impact future activities not initially identified within CAP 1864. Once the survey has been completed and analysed, a level of priority will be attached and included in the Onshore safety plan. We anticipate survey return by end Q1 2023.

AAIB Assessment – Partially Adequate Open

Response received: 17 June 2022

The Onshore Safety Review (CAP1864) did not generate any specific actions or recommendations regarding FDM, but is referenced in Chapter 13 AOC management and operations:

13.15 The balance to be struck is between keeping risks as low as reasonably practicable whilst remaining commercially viable and compliant. Nevertheless, how can the management team be certain that operations manual SOPs are being followed by flight crew particularly on single-pilot operations where decisions go unchallenged. There is no doubt that Flight Data Monitoring (FDM) as required by legislation for larger aeroplanes and offshore helicopters has had an impact in identifying operations outside the established limits. At present helicopter FDM is not mandated for onshore operations but should be considered.

One of the challenges in this sector is the small fleet sizes and difficulty in using FDM data most effectively (rather than be seen as 'policing action'). Nonetheless several onshore operators have invested in FDM over the past few years with mixed feedback on safety utility. However, we have agreed with the Onshore Safety Leadership Group that this will be a safety focus item for a bespoke industry working group that the CAA will support. The terms of reference of this group are yet to be finalised but will include both FDM and VHM (Vibration Health Monitoring). We will be in a position to provide an update on progress by the end of 2022.

AAIB Assessment – Partially Adequate Open

Response received: 01 March 2022

This item has been raised informally with industry, but more work is required to understand the potential benefits for small fleet sizes (typical with this sector) and the types of operation conducted. External subject matter experts are being considered to assist with this project.

AAIB Assessment – Partially Adequate Open

Response received: 23 December 2021

As mandating FDM was not part of CAP1864 published in Nov 2019, which agreed on the safety priorities for this sector, we intend to work in close collaboration with the Onshore Leadership Group for consideration of FDM for all commercial operations and non-commercial complex helicopter operations. If it was so determined that FDM should be mandated for this sector, then this would involve the development of a new Rule Making task which would include a full safety and cost benefit analysis that would necessarily involve public consultation and justification.

AAIB Assessment – Partially Adequate Open

Response received: 08 September 2021

The CAA partially accepts this recommendation. The CAA recognises the benefits of the principle of Flight Data Monitoring (FDM) and would encourage Onshore Operators to establish an appropriate programme as part of their Management System. However, the CAA is also conscious of the constraints and limitations placed upon small operators and the challenges they face but will work in close collaboration with the Onshore Leadership Group to progress the safety priorities published in CAP1864 (Onshore Helicopter Review Report) in Nov 2019 including the consideration for FDM for all commercial operations and non-commercial complex helicopter operations. If it was so determined that FDM should be mandated for this sector then this would involve the development of a new Rule Making task which would include a full safety and cost benefit analysis that would necessarily involve public consultation and justification.

AAIB Assessment – Not Adequate Open