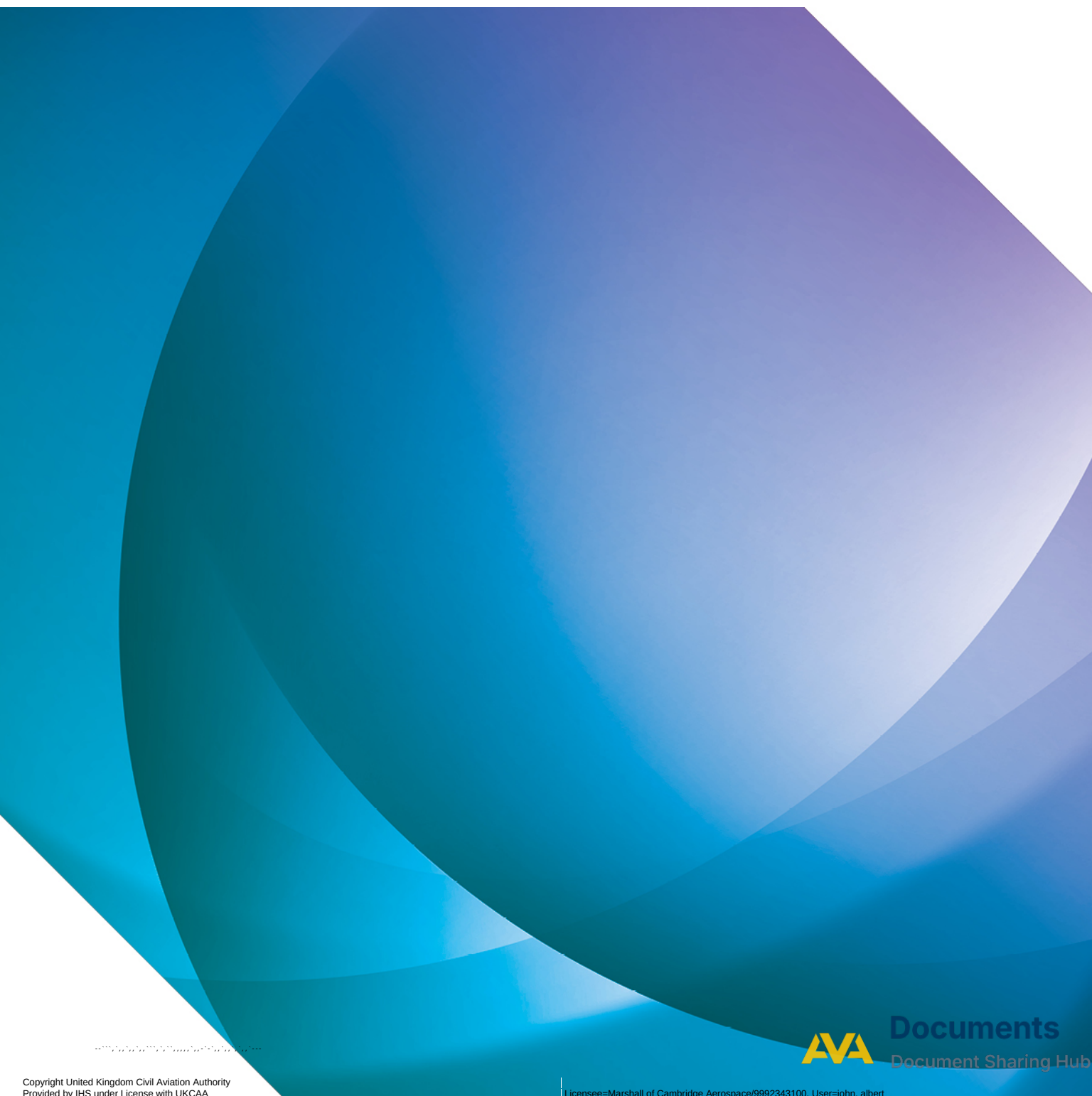


Safety review of offshore public transport helicopter operations in support of the exploitation of oil and gas

Progress report

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Enquiries regarding the content of this publication should be addressed to:
Safety and Airspace Regulation Group, Civil Aviation Authority,
Aviation House, Gatwick Airport South, West Sussex, RH6 0YR

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Contents

Foreword	4
Introduction	5
About this report	6
Passenger safety and survivability	8
Improving passengers' chances of escape	8
Improving passengers' chances of rescue	11
Operations	12
Adopting a more consistent approach to safety	12
Reviewing and reducing risks around helidecks	14
Raising the standards of pilot training	15
Airworthiness	18
Understanding technical failures and failure alerts	18
Redefining critical parts	19
Ensuring Vibration Health Monitoring is applied consistently	19
Continuing Airworthiness	19
Improving knowledge and facilitating change	21
Learning from survivors	22
Next steps	23
Progress at a glance	24
Actions	24
Recommendations	34

Foreword

The safety of those who travel on offshore helicopter flights is, and should be, paramount. Between 2009 and 2013 there were five significant accidents in the UK sector, two of which tragically resulted in fatalities. In the light of this, the CAA Board commissioned a comprehensive review of the safety of offshore helicopter operations. This resulted in a number of wide-ranging recommendations and actions to improve safety standards, and we made clear our determination that these be implemented as swiftly as possible.

Ten months on from the publication of our Review, substantial and important progress has been made toward improvements in offshore helicopter safety. Today, flights no longer take place over the most extreme sea conditions. Every single passenger on an offshore helicopter is equipped with new improved Emergency Breathing System (EBS). Offshore workers have received new guidance and – crucially – improved safety training. We believe these changes together will contribute to lives being saved in the UK offshore industry in the years to come.

There is a strong collective commitment to change evidenced by the cooperation received from all of the parties represented in the newly formed Offshore Helicopter Safety Action Group (OHSAG), which is proving a catalyst for increased dialogue between helicopter operators, employee representatives, manufacturers and regulators. Such collective commitment was also evidenced in the manner with which helicopter operators and the oil and gas industry responded to the CAA Board challenge to ensure that all offshore workers were trained in the use of the new Emergency Breathing System in a matter of weeks. This commitment will be essential as we seek to not only improve the chances of passengers surviving a safety occurrence, but also to take real steps towards reducing the number of safety occurrences altogether.

As the Review made clear, achieving this broader, longer-term goal requires improvements in many areas, from flight crew training to helicopter design and production to ongoing maintenance. As the regulator, the CAA recognises that change in these areas will take time, to not only to agree with other interested parties but also to have a tangible impact. Yet that recognition aside, this report shows that the Review has already helped to accelerate progress on a number of industry-led safety initiatives, from those co-ordinated by manufacturers to some which are now the responsibility of HeliOffshore, the newly formed representative body for helicopter operators.

Specific actions in the Review focused on gathering evidence to assess the viability of proposed safety improvements around issues such as offshore communication and helideck certification, and on aligning standards for flight crew training. In this report, we are able to confirm that these actions are on track; the real challenge, however, is still to come as, with the helicopter industry and the wider oil and gas sector, we seek to turn the

progress made to date into to an enduring enhancement of the safety culture around offshore helicopters.

Such change of course depends on sustained engagement from helicopter operators, manufacturers and the industry. While we recognise that recommendations with regard to airworthiness certification require broad consultation before being formally introduced, we believe that faster progress could be made – giving helicopter operators and manufacturers greater clarity and certainty about what is expected of them. We will be strongly encouraging such activity, but the wider regulatory community, both domestically and internationally, must also play its part in making reforms and ensuring industry meets its commitments.

The safety of those who rely on offshore helicopter flights is our absolute priority: we all know exactly what is at stake. I hope that in our next progress report, we will be able to show that the short-term actions completed to date are being followed by the further steps needed to secure long-term change.

Mark Swan

Director, Safety and Airspace Regulation, CAA

Introduction

In February 2014, the CAA published a Safety Review ('the Review') of offshore helicopter operations. The Review examined the risks to helicopter operations to support the oil and gas industries in and around the North Sea. It was conducted in conjunction with the European Aviation Safety Agency (EASA) and the Norwegian Civil Aviation Authority and was peer-reviewed by independent experts. It identified a wide range of opportunities to improve the safety of those operations and in particular to increase the chances of passengers and crew surviving an accident.

While acknowledging that eliminating such accidents altogether is an unrealistic goal, the Review made it clear that more effort could and should be made to reduce the chance of accidents occurring. It therefore recommended that steps be taken to improve flight crew training and maintenance standards and place restrictions on operations in certain weather and sea conditions.

In total, the Review listed 32 actions and 29 recommendations that would all contribute towards the end goal of improving the safety of offshore helicopter operations. Some of these would necessitate long-term changes in areas such as helicopter design; others could be implemented almost immediately, and have an instant impact on survivability.

About this report

We stated we would report publicly on the progress of all actions and recommendations in the Review. This document fulfils that requirement – providing an update on progress as at January 2015. It highlights the areas where most progress has been made to date, and considers what that means for the offshore industry, the helicopter industry and those who work in both.

At the end of the report, there is a full table summarising progress against each action and recommendation. As this table shows, progress has been made on all actions and most recommendations. Not all are yet complete, but we are on track to complete them on schedule, unless specifically stated in the table. A further progress report will be produced in 2015.

Since the Review was published, several further reports have followed, including:

- the Transport Select Committee's *Offshore helicopter safety* report (July 2014) www.publications.parliament.uk/pa/cm201415/cmselect/cmtran/289/28902.htm
- the Air Accidents Investigation Branch (AAIB) *Report No: 2/2014. Report on the accidents to Eurocopter EC225 LP Super Puma G-REDW, 34 nm east of Aberdeen, Scotland on 10 May 2012 and G-CHCN, 32 nm southwest of Sumburgh, Shetland Islands on 22 October 2012* www.aaib.gov.uk/publications/formal_reports/2_2014_g_redw_g_chcn.cfm

Both have provided important insight and impetus to support the ongoing work to improve offshore helicopter safety, as have reports – official and anecdotal – of other incidents not just in the North Sea but worldwide. The CAA continues to monitor all AAIB reports, and those of its peers in other territories, and as well as addressing any specific AAIB recommendations actively seeks to learn from all incidents.

Chapter 1

Passenger safety and survivability

As the Review made clear, improving the protection of passengers in the event of an accident must be a priority. Evidence showed that just over half of the accidents in which offshore helicopters impacted the sea between 1976 and 2012 were potentially survivable, but led to 38 fatalities.

The Review announced several actions and recommendations aimed at increasing the chances of passengers and crew surviving after a water impact. In almost all cases these have progressed on schedule. Several were addressed through CAA Safety Directive SD 2014/001, issued on 21 May 2014, and replaced by SD 2014/002 on 14 October 2014; these mandated the changes.

As a result, we believe that several of the major risks identified in the original report have now been reduced, and therefore anticipate that, in the event of future accidents, the survival rate will be considerably higher.

Improving passengers' chances of escape

Of the 38 people who died from survivable water impacts between 1976 and 2012, 31 failed to escape from the helicopter. While these fatalities all took place before 1993, in August 2013, four passengers were killed when a CHC Helicopter Eurocopter AS332 crashed into the North Sea on approach to Sumburgh Airport. This accident was clearly 'survivable', but three passengers did not escape from the helicopter. This reinforced the view of the Review that steps should be taken to make escape from a ditched and/or capsized helicopter easier.

The first key step was to reduce the likelihood of the helicopter sinking. To this end, since 1 June 2014, helicopter operators have been required to ensure that the Emergency Flotation System – fitted as standard on all the helicopters in use offshore – is armed for all overwater departures and arrivals.

The Review also recommended that helicopter operators fitted a side-floating helicopter scheme, which previous research has identified as being a valuable additional safety measure. Due to the lack of any developed schemes for the helicopters currently in use in the North Sea, this has not yet been taken forward. However, regulators at EASA as well as the CAA remain strongly in favour of side-floating helicopter schemes or an equivalent technical solution: the issue is therefore under consideration as part of EASA's current Rulemaking Task activity around helicopter ditching occupant survivability (RMT.0120).

New EBS for all passengers

Progress in other areas around survivability has accelerated ahead of schedule. To make it easier to escape, the CAA Safety Directive SD 2014/001 prohibited the use of seats that are not next to authorised underwater emergency exits (push-out windows), unless the helicopter has an EASA approved side-floating scheme or equivalent fitted, or all passengers are wearing a suitable (Category A) Emergency Breathing System (EBS) as specified in CAP 1034 (Development of a Technical Standard for Emergency Breathing Systems). These systems can be deployed underwater and in less than ten seconds – a major improvement on previous equipment.

The CAA originally proposed that the requirement for the new EBS should come into force in April 2016, with the seating restrictions imposed from 1 June 2014 as an interim measure. We subsequently agreed to delay the implementation of the seating restrictions until 1 September 2014. This followed evidence from the oil and gas industry that reducing helicopter capacity through the resulting seating restrictions could have an adverse impact on critical safety maintenance work due to take place at offshore installations over the summer.

However, at the same time, we significantly brought forward the date from which the new EBS would be made compulsory, to 1 January 2015. In fact, the EBS approved by the CAA against CAP 1034 was introduced for passengers by industry ahead of schedule, from 1 September 2014. The EBS is built into new lifejackets which were approved by EASA in July 2014. A flight crew version of the new EBS is expected to be introduced during 2015.

EASA has included items from the CAA Safety Directive in the Comment Response Document (CRD) to its Notice of Proposed Amendment (NPA 2013-10). Based on responses received, an opinion containing the final draft regulations for Specific Approval for helicopter offshore operations will be published early 2015.

The oil and gas industry has worked hard to provide the basic training required on EBS usage to all offshore workers, with 57,000 trained in just six weeks. Oil and gas industry safety group Step Change in Safety (Step Change) reports that feedback from the workforce on the lifejackets – as monitored through social media – has been consistently positive.

Passenger size v window size

Arguably the single action that received the most publicity at the time the Review was published was around passengers' body size. Quite simply, if passengers cannot fit through the push-out windows, they are not only at greater risk themselves, but also increase the risk to their fellow passengers, whose access to an exit may be blocked.

The Review stated that from 1 April 2015, helicopter operators would not be allowed to carry passengers who could not fit through the push-out window exits. This provoked some comment from unions and from the Transport Select Committee. Changing window

size is a significant design issue and would take some time to be introduced and might prove impractical for existing helicopters. Therefore, the Review action might potentially mean that some of the offshore workforce would not be able to be carried in helicopters with small windows. Those that could not be carried to offshore locations might be made redundant as a result.

This was not the intention and we have worked closely with Step Change, helicopter operators and experts at Robert Gordon University (RGU) to find the best possible solution.

A minimum width and diagonal measurement has been established for push-out windows. The width of the opening corresponds to passenger chest depth and the diagonal to shoulder width. (It has been established that these measurements are more relevant to escape through an emergency exit than body weight or BMI.) It is anticipated that workers' shoulder width will be measured during an initial dedicated campaign and then monitored at convenient opportunities thereafter. Any passengers that would not fit through these push-out windows will be seated adjacent to the larger exits which are required under the airworthiness rules on all helicopters.

Evidence from the RGU study indicates that the proportion of passengers needing to be seated next to a larger exit is compatible with the availability of these seats. As a result, we are confident that no offshore workers should lose their job due to the body size/window size action.

Reducing the risk of capsizing in a ditching

From 1 September, helicopters have not been allowed to fly to or from offshore locations when the sea state exceeds the certificated ditching performance of the helicopter. This prohibition was included in the Safety Directive 2014/001 issued in May; helicopter operators were given time to work with manufacturers to confirm the certified ditching performance of their fleet.

EASA has subsequently issued Airworthiness Directives under which the demonstrated ditching performance of all offshore helicopters must be specifically notified in the Rotorcraft Flight Manual. Since first publication, EASA has further clarified the aim of the directives which is to ensure that the helicopter demonstrated capability will be known to those operating the specified aircraft and that this capability will be accounted for by the operators when assessing the safety of helicopter dispatch in any sea-state conditions.

Longer-term improvements

The Review also made the recommendation that helicopter operators should consider fast-tracking the implementation of some of the survivability improvements under discussion for inclusion in the EASA Rule-Making Task (RMT) 0120. This would mean acting in advance of the RMT being completed. Step Change has committed to investigate the feasibility of changes in these areas, working with manufacturers and helicopter operators. However, this recommendation specifically challenged helicopter operators to address the issue,

rather than the oil and gas industry. Given that survivability is high on the agenda of HeliOffshore, the newly launched industry body formed by helicopter operators, this may represent a more appropriate forum for progressing this work.

Progress is underway to review the broader safety and survival training provided to offshore workers. The Offshore Petroleum Industry Training Organisation (OPITO) leads on this and it has stated its review will be complete by February 2015, with new standards introduced by March 2015. While this is slightly later than we initially expected, it is nonetheless well underway. Further work to review pre-flight safety briefings will follow the completion of this training review. In the meantime, we are continuing to liaise closely with representatives of the offshore workforce to ensure that any concerns regarding pre-flight briefings are addressed.

Improving passengers' chances of rescue

Escaping from a ditched helicopter is only the first step to surviving an accident; the next is to make it into a life-raft and await rescue. Strong winds and high waves, both common in the North Sea, make it harder for rescue craft and helicopters to reach an accident site and locate and recover passengers and crew; these conditions can also compromise the effectiveness of the life-rafts. To mitigate this risk, we have now prohibited offshore flights when, at the planning and pre-departure stage, the significant wave height en-route and at the offshore location exceeds six metres (sea state 6 on the World Meteorological Organisation (WMO) scale). This prohibition came into force on schedule on 1 June 2014.

New clothing policy

Another important element in enhancing survival while awaiting rescue is retaining core body warmth in the cold waters of the North Sea. To that end, a new standardised clothing policy has been set by the oil and gas industry for offshore helicopter travel in UK waters having been agreed via Step Change. This industry policy requires all passengers to wear two layers of clothing under their survival suit in summer and three layers in winter (each including one long sleeve top). The specifications for the layers and the summer/winter switch-over dates have been standardised across all oil and gas companies and came into effect on 1 October 2014.

Chapter 2

Operations

While the actions toward increased survivability have led to immediate change, in the operations sphere, the actions are focused more on the medium term. Here, the Review identified some risks and issues, but set out to work with helicopter operators and the wider oil and gas industry to agree the most effective ways to raise safety standards.

Progress has broadly continued on schedule. Helicopter operators have shared their concerns and priorities, while further research has begun around helideck safety and offshore communications.

The most rapid progress has been towards the standardisation of pilot training. The input of helicopter manufacturers is leading to greater emphasis on adhering to documented procedures, particularly for the use of complex automated systems, and training is also being revised to address the operating environment of the North Sea. Developments in pilot training should ultimately help reduce incidents related to pilot error, particularly those associated with aircraft complexity; this is therefore a crucial long-term opportunity to increase the safety of helicopter travel, not only offshore but in all operations.

The engagement of helicopter operators, manufacturers and training organisations in the work to increase standardisation is welcomed, and it is anticipated that the progress to date – largely around standard-setting – will translate into more robust training programmes.

Adopting a more consistent approach to safety

One of the key findings of the Review was that while helicopter operators all had their own Safety Management Systems (SMS), there were major differences in what these addressed. The helicopter operators had already recognised this before the publication of the Review, and begun their own initiative, the Joint Operators' Review (JOR), which aims to share safety data and identify and agree on best practices. This led to the establishment of HeliOffshore, a new safety organisation consisting of five of the world's largest helicopter operators, which will also assume the roles of the trade body, the European Helicopter Operators' Committee (EHOC). HeliOffshore formally launched on 21 October 2014.

To support increased collaboration around safety, we held an SMS symposium in Aberdeen on 2 July 2014. This was attended by the main UK offshore helicopter operators, the Helideck Certification Agency, the Belgium CAA and the Danish Transport Authority.

At the symposium, we presented a detailed analysis of offshore helicopter safety occurrences and invited the industry to share their view on the risks affecting their

operation. There were open and frank discussions on safety, which led to the identification of a top ten list of issues, suggestions for their mitigation and meaningful measures of their performance. The top ten issues identified were:

- Night Operations to Helidecks
- Bow Deck Operations
- Training & Experience
- Oil & Gas Intrusion (including commercial pressure)
- Flight Deck Automation
- Operations to NUIs
- Fatigue (flight crew, engineering, ground operations staff, management)
- Helideck Standards (obstacles/collision/Fuel/HLO)
- Aircraft Design & OEM Support
- Weather (including lightning, weather information, visibility).

We are working with operators to refine these outcomes from the symposium and check that the suggested risk mitigations are appropriate.

Since the symposium, a member of our Safety Performance team has visited the three Aberdeen-based offshore helicopter operators to launch a collaborative project to raise the quality of reported safety data and its subsequent analysis. This will lead to improved ability to identify safety issues and measure safety performance (including the effectiveness of actions or controls to mitigate safety risk), which will contribute to a more effective SMS. The collaborative work will also include the development of bowtie safety risk models to target specific safety issues raised at the symposium, and any further concerns that emerge. The bowtie models will then provide the foundations for improvements that address the specific safety issues raised by the industry.

A further step towards consistency is a project being led by Oil & Gas UK which aims to harmonise processes for flight safety auditing. The project aims to identify and agree best practice standards for such audits, so that instead of undergoing multiple audits with slightly different demands for each customer, helicopter operators will increasingly be asked to demonstrate how they meet common standards. This will reduce the burden for helicopter operators but also help clarify the prime safety issues for customers.

The project is taking place in conjunction with the International Association of Oil and Gas Producers (OGP) with the aim of setting harmonised requirements. The OGP's Aviation Sub-Committee (ASC), the CAA and the helicopter operators are fully engaged with it.

The first phase outcomes will see the development of a standard Pre-Audit Questionnaire and Audit Template, available for download from Oil & Gas UK. Longer term work will

focus on improving audit management and quality, including performance measurement and auditor competence. These are important elements of addressing the commercial concerns flagged by the Transport Select Committee in its report, and are areas where we believe the industry is best placed to act collectively rather than the CAA alone. It is expected that the issue of harmonising safety audits will also be addressed in this way.

Reviewing and reducing risks around helidecks

The Review set out a longer term intention to improve safety on helidecks, in particular through the CAA taking responsibility for certifying them. The SMS symposium in July emphasised the view that a number of the most significant risks are helideck-related: by putting certification of helidecks on a more robust legal footing, safety standards on offshore helidecks should rise significantly.

Already, as per the Review's actions and recommendations, work has begun to review certain specific aspects of operations to offshore helidecks, to identify safety measures that can be taken in the shorter term.

Minimising the risk of fire

The Review endorsed our long-held position that post-crash fire is a reasonably foreseeable event and as such presents a major risk for helicopter accidents. Even though no post-crash fire is known to have occurred on an offshore platform in the UK sector, there have been isolated 'crash and burn' incidents in other offshore sectors dating back to the 1970s. CAA enforcement of good practice has not been possible due in part to the unlicensed status of helidecks, coupled with the fact that CAP 437 represents best practice standards for industry but is not applied in offshore regulation.

As a result, helicopter operators, supported by the CAA, raised the concern that fire-fighting provisions on a significant number of helidecks (those located on Normally Unattended Installations (NUIs)) is insufficient to address a worst case crash and burn event. In 2011, we wrote to Oil and Gas UK, requiring the companies that own and manage the NUIs to install additional automated fire protection equipment.

The Review reinforced our position, with recommendations specifically addressed at the oil and gas industry – to incorporate the fire-fighting provisions previously set out by the CAA for all offshore helicopter landing areas on NUIs, without delay – and at helicopter operators, to apply the same risk-reduction methodology they would use elsewhere to NUI operations too.

However, there remains significant debate between aviation regulators, helicopter operators and the oil and gas industry about what additional standards and equipment should be applied for NUIs. To bring the matter to a conclusion, we have commissioned Cranfield University to undertake a detailed review of the cases for and against improved fire-fighting services on normally unattended helidecks. The detailed study was completed in early 2015 and is presently under review. It is anticipated that the study will deliver a