SERIOUS INCIDENT

Aircraft Type and Registration:	Agusta Westland AW189, G-OENC
No & Type of Engines:	2 General Electric Co CT7-2E1 turboshaft engines
Year of Manufacture:	2017 (Serial no: 89002)
Date & Time (UTC):	25 March 2019 at 1600 hrs
Location:	Forties Charlie platform, Northern North Sea
Type of Flight:	Commercial Air Transport (Passenger)
Persons on Board:	Crew - 2 Passengers - 4
Injuries:	Crew - None Passengers - None
Nature of Damage:	None
Commander's Licence:	Airline Transport Pilot's Licence
Commander's Age:	49 years
Commander's Flying Experience:	14,000 hours (of which 600 were on type) Last 90 days - 16 hours Last 28 days - 16 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot

Synopsis

While operating to the Forties Delta platform the pilots misidentified and landed on the visually similar Forties Charlie platform.

The operator has issued a safety notice detailing the lessons learned from the incident and a Flying Staff Instruction amending the guidance in the Operations Manual on the Avoidance of Wrong Deck Landings.

History of the flight

The pilots reported for duty to conduct a multi-sector flight carrying passengers and freight to the platforms in the Forties field. The routing was Aberdeen/Dyce (Aberdeen) Airport – Forties Delta platform (40D) – Forties Alpha platform (40A) – Forties Bravo platform (40B) – Forties Echo platform (40E) – Aberdeen Airport (Figure 2). The operator had allocated an AW189 helicopter, registration G-OENC, to the flight.

The pilots shared the planning duties covering all the aspects outlined in the operator's defined MATE briefing format[1], which included discussion of the routing and the payload; they determined that there would be no requirement to re-fuel offshore. However, there was

Footnote

[1] See section MATE brief.

no detailed discussion that the similarity of the platforms could result in misidentification of the destination, nor means to mitigate this possibility. The pilots decided that the commander would carry out the PM role from the left seat, while the co-pilot would carry out the PF role from the right seat, enabling the co-pilot to gain further experience. They did not identify at this stage which of them would be conducting the deck landing for each of the helidecks.

During the cruise at 3,000 ft, the PM contacted the Forties field on the logistics frequency[2] to confirm routing and payloads. The pilots then elected to make an early en route descent and the PM transferred the flight-watch[3] to the traffic frequency[4] of the Forties field. As they were passing 1,500 ft in the descent, the pilots were able to identify all the platforms in the field including the 40D platform, which they confirmed as the destination, with the 40A platform in alignment behind. The pilots determined that the pilot in the left seat would conduct the landing on 40D, requiring a handover of control at a later stage, since the wind direction and deck orientation favoured an approach from the right. Once level at 500 ft with about 15 nm to the platform, the pilots carried out the approach checks.

Shortly afterwards, the PF commented on the unusually elevated position of the crane on the Forties Charlie (40C) platform, which was offset forward and left of track. The pilots then discussed the crane's position and the implications for an approach and landing.

With under 5 nm to the destination, the pilots completed the landing checks. However, they did not read the platform name on the helideck. While the PM was occupied making a radio call, the PF focused inside the cockpit and selected heading mode for the autopilot. On looking back up outside, the PF then made a left turn into wind towards the platform that he saw out to the left, which he identified as the destination platform (but was in fact the 40C platform).

The pilots identified that the crane by the helideck was not in the stowed position and represented a potential hazard beyond the far edge of the helideck. The PM made a radio call on the traffic frequency to the Helideck Landing Officer (HLO) of the 40D platform requesting that the crane be stowed. The HLO advised that this would close the deck and result in a delay while he mustered the crane operator to move the crane out of the way. The pilots discussed the implications and performance of the aircraft and elected to continue the approach and land.

Footnote

[2] The Logistics frequency is used by the crews to communicate with the destination platform to pass logistical and administrative information. (This is a unique frequency common to all platforms within a specified area.)

[3] Flight watch is normally provided by ATC, but when coverage is poor or absent, pilots will pass information to the traffic frequency to include callsign, helicopter type, souls on board, position and distance and time to go to destination. This enables 2-way radio communication with an agency to be maintained and enhances the awareness of crews of the activity in-field or at nearby installations.

[4] The traffic frequency is used in-field to provide radio communication in-field and at low level when ATC coverage is poor or absent. (This is a unique frequency common to all platforms within a specified area.)

Once the helicopter was established on the final stage of the approach, the commander in the left seat took over the role as PF and carried out the landing on the helideck of the 40C platform. On completion of the landing checks, the pilots noticed that no deck-crew approached the helicopter and it was at this stage the pilots noticed the 'Forties Charlie' name on the helideck.

The pilots informed the 40D platform that they had landed on the 40C platform and requested that a helideck crew muster on the platform to carry out safety checks and provide fire cover; they also requested the crane to be repositioned. The pilots briefed the passengers, completed the deck turnaround checks and continued to the 40D platform.

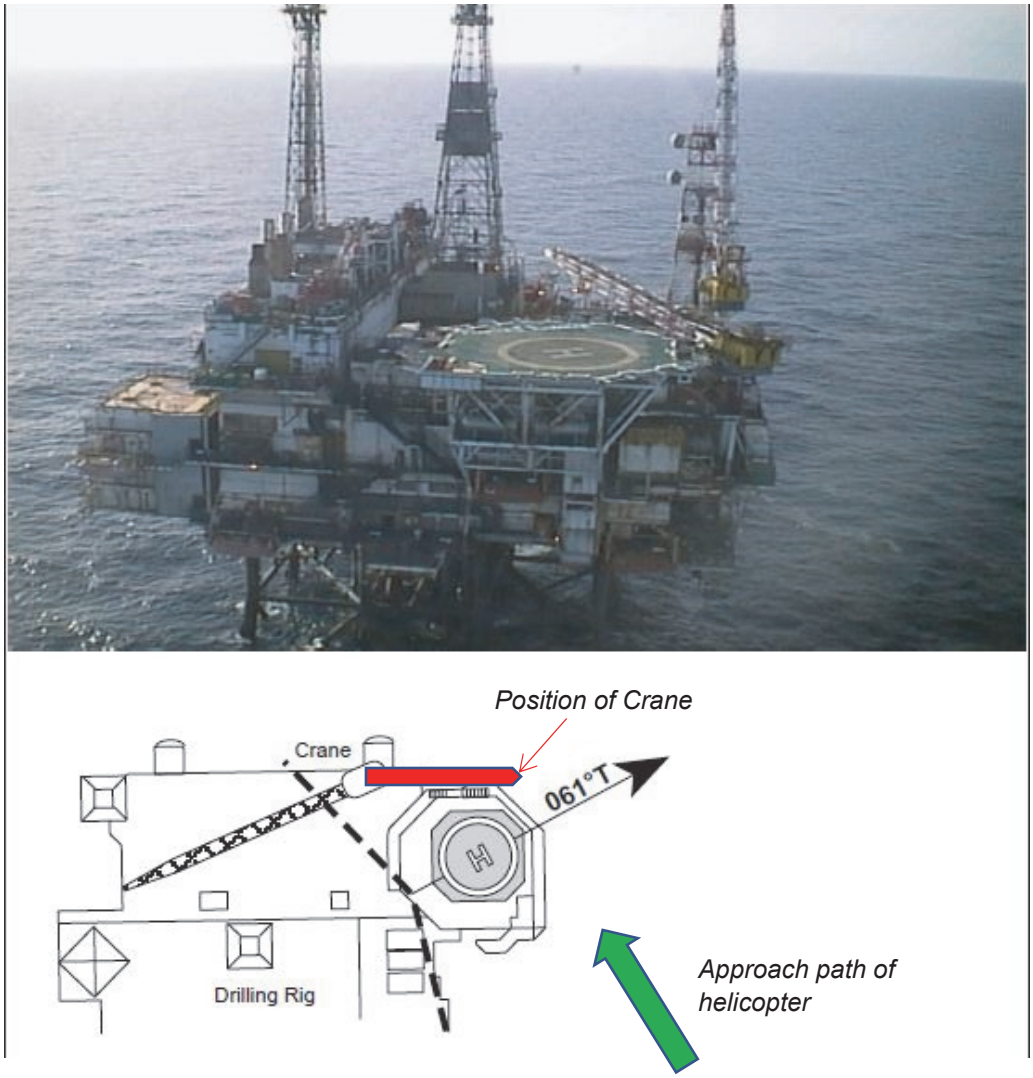

Figure 1
Forties Charlie (40C) platform

Forties field

The Forties field (Figure 2) is situated between 103 and 109 nm east of Aberdeen Airport and consists of five platforms. When viewed from height while approaching from Aberdeen, four of the platforms appear grouped in an elongated diamond with the 40C to the west, and the 40A to the east. The 40B is to the north and the 40D to the south, while the 40E lies to the east of this main group; the BP Unity platform is situated a few miles to the west.

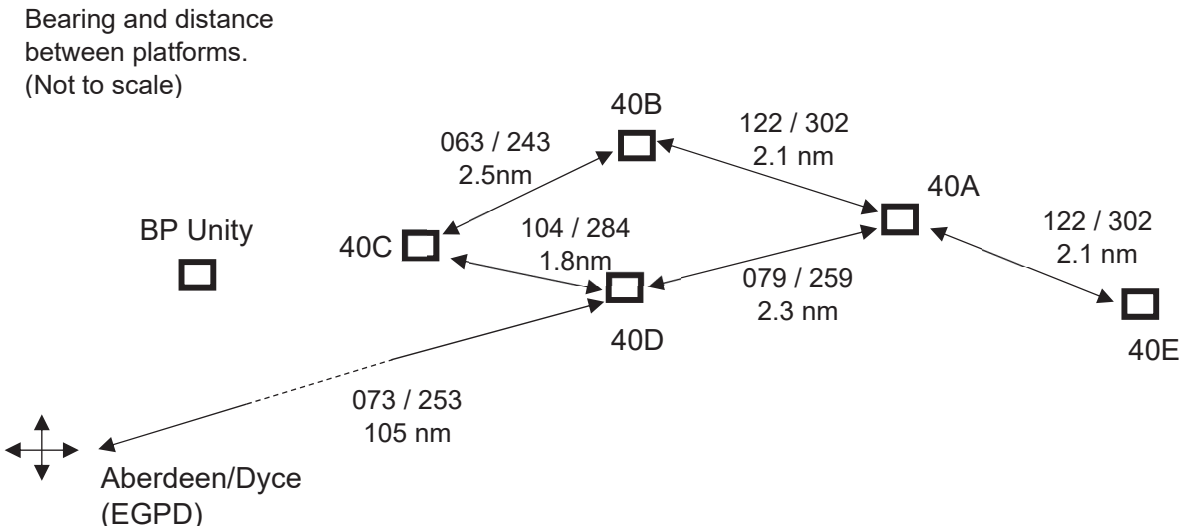

Figure 2
Forties field layout

Forties platforms

The 40A, 40B, 40C and 40D platforms look almost identical, with the helideck located on the north-east corner of the platforms, a central derrick and a vertical flare-stack on the south-west corner. Each has a crane on the northern edge of the platform adjacent to the helideck. The 40A platform is distinguishable from the other three by the addition of a bridge to a satellite platform on its western side. Both the 40C (Figure 1) and 40D (Figure 3) have their helidecks aligned on an identical heading of 061°T.

Recorded information

The length of the flight resulted in the CVR being overwritten by the time the aircraft had completed the tasking. Flight data was available from the helicopter's quick access recorder and enabled the flight path to be recreated.

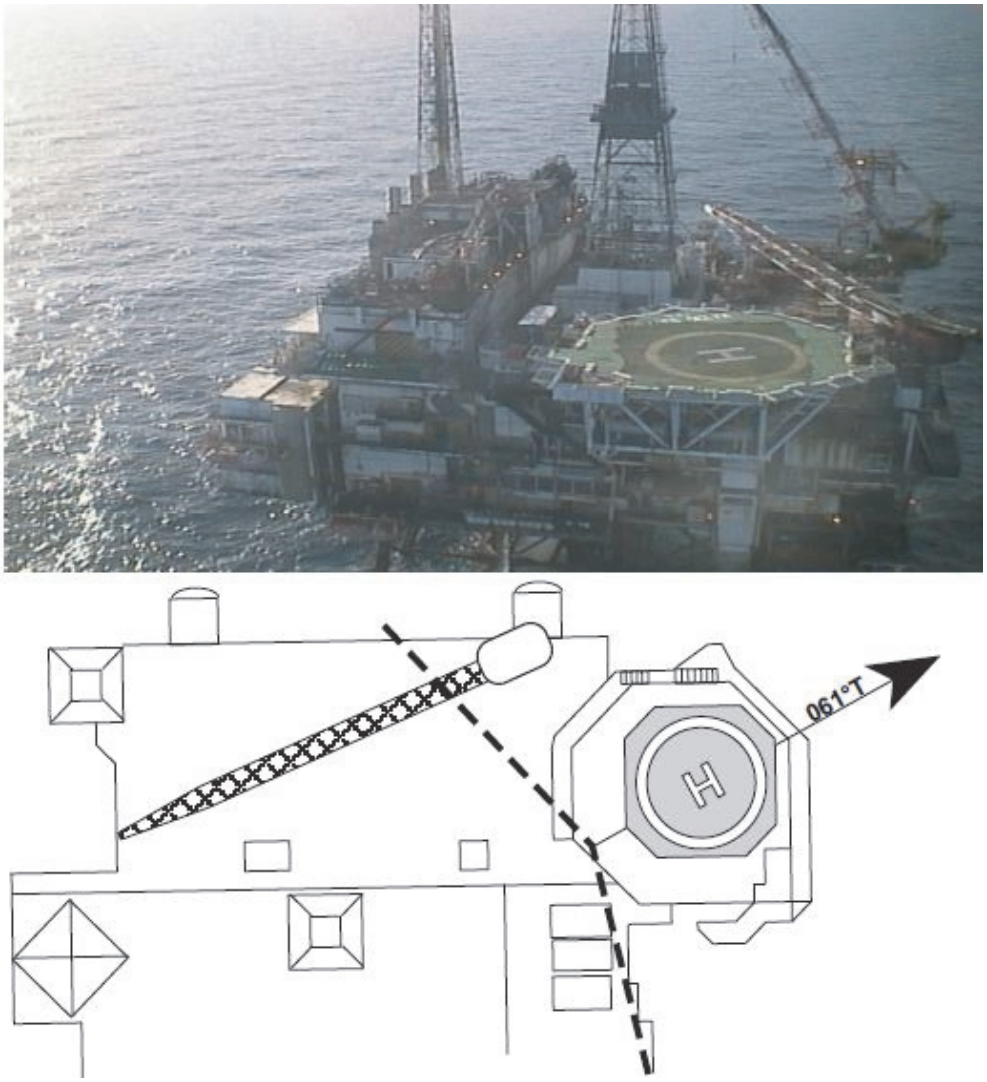

Figure 3
Forties Delta (40D) platform

Aircraft cockpit displays

The AW189 cockpit has four multi-functional displays (MFD) allowing a variety of configurations. The standard configuration is for the outer MFD on each side to have the Primary Flight Display (PFD) selected (Figure 4). The upper part of the PFD, known as the Primary Flight Indicator (PFI), displays the artificial horizon and other flight instrumentation including IAS, groundspeed, height, altitude and vertical speed information. The lower centre part of the PFD is the navigation display area which can be selected to display a compass rose in Horizontal Situation Indicator (HSI) mode, Map mode or Hover mode. In HSI mode, the compass rose has a course deviation bar which indicates whether the helicopter is deviating left or right of the track of the planned route. Below the PFI and to the bottom left of the HSI display is the Navigation Information, where the waypoint name and distance to the waypoint are displayed. Rotor instrumentation is displayed below the PFI and to the right of the compass rose, and the engine, gearbox hydraulic and fuel indications

are displayed on the let below the Crew Alerting System which is itself to the left of the PFI. (The PFD also displays annunciations for the automatic flight control system and radio frequencies).

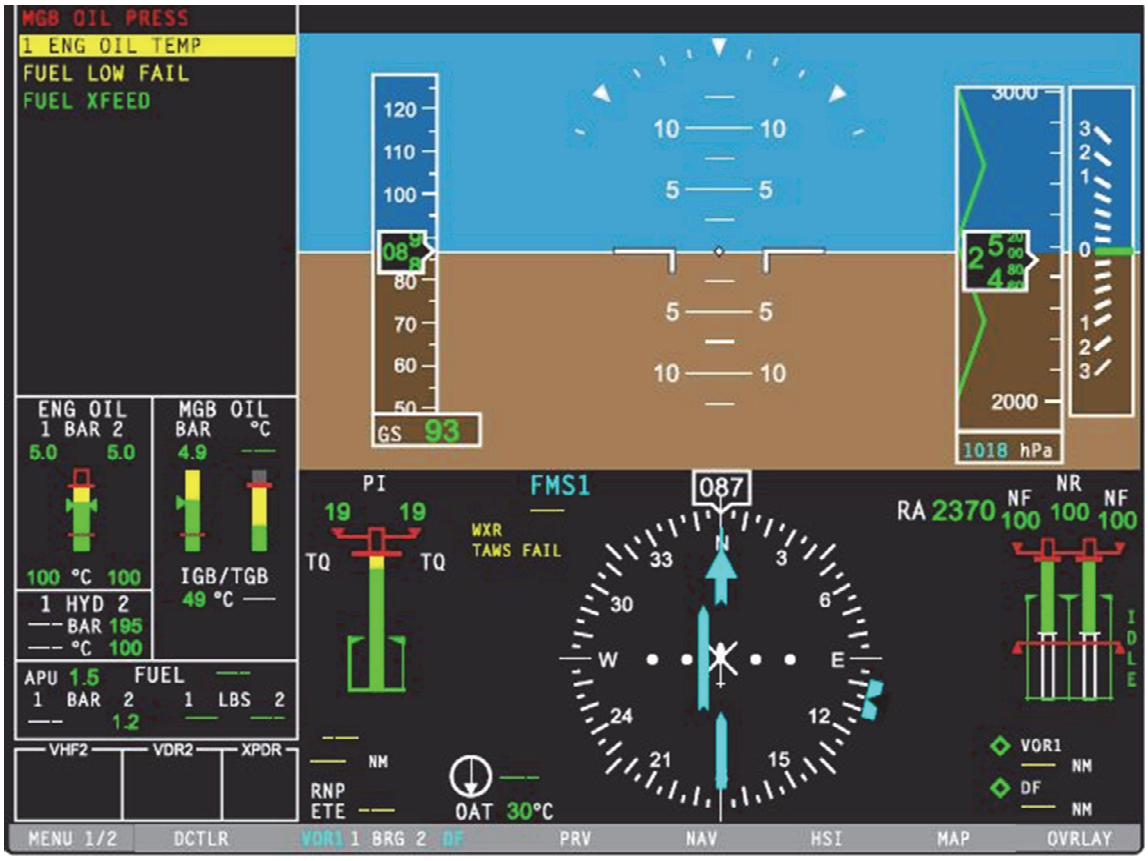

Figure 4

AW 189 Primary Flight Display

The inboard MFD can be selected to display several functions including the FPLN (flight plan) page or the P-PLANT (powerplant) page. The FPLN page displays the route of the helicopter as defined by the flight plan entered into the flight management system (FMS), while the P-PLANT page displays engine, rotor and electrical parameters.

Use of automation and the flight management system

The pilots used automation in accordance with the operator's procedure, with the FMS as the navigation source. At the time of the incident, the pilots had correctly programmed the route into the FMS and had selected the 40D platform as the destination with a 'fly-over'[5]. Once the pilots had swapped roles, the PM in the right seat selected the P-PLANT page on the inboard MFD. This resulted in the loss of the display of the FMS navigation data on the inboard MFD to the PM.

Footnote

[5] Selection of 'fly-over' is the means by which the FMS routing can be forced to overfly the waypoint. This prevents the aircraft from flying a 'smart turn' prior to the waypoint to intercept the track of the next sector.

Meteorology

There was good visibility in the Forties field at the time of the incident with medium-level cloud and the wind direction was 320 ºT at 22 kt.

Personnel

The commander was an experienced helicopter commander in the offshore oil and gas role who had recently returned from a period of absence and completed a return-to-work package including simulator and line training. This was his first flight as commander since his return. The co-pilot had operated offshore in the North Sea for over eight years.

Human factors

A report from a study into the causal factors that contribute to the occurrence of wrong deck landings categorised three types of wrong deck landings[6]. The study analysed and identified the factors that led to misidentification and the incorrect selection of platforms as the destination and why crews subsequently were not able to break their confirmation bias.

Organisational information

Since the operator has a single contract for the AW189, the group of AW189 pilots is small. Consequently, flights are regularly rostered with the same pilots, who operate primarily to the Forties field conducting multi-sector flights, often more than once, on an almost daily basis.

MATE brief

The operator employs a pre-flight planning process called a 'MATE' brief, which covers Meteorology, ATC and Airspace, Airframe, Times and en route considerations. The aim is to ensure pilots consider all the potential threats and errors, including wrong deck landings (WDL), that may arise during flight for the conditions that exist that day.

Standard operating procedures

Prevention of WDLs are specifically addressed in the Operations Manual Part A 8.2.10, *'The Avoidance of Wrong Deck Landings'*, using a 5-stage process:

1. *As part of the pre-flight planning process discuss the routeing in relation to the other platforms or rigs nearby and the possibility of a WDL. This should include approach directions and deck orientations. If the destination is a NUI[7], then consideration must be given to completing a pre-landing orbit to confirm identity, weather permitting.*

2. *Always put the full route in the FMS, using route discontinuities to ensure the next destination is held. Where possible, add other nearby locations*

Footnote

[6] Jarvis, S (2015) *Wrong Deck Landings Research and Investigation Report*, Jarvis Bagshaw Ltd.
[7] Normally unmanned installation.

to improve situational awareness. What is possible will depend upon aircraft type and guidance will be added to each Part B.

3. *Confirm that the route as planned matches the route manifested by the client and the route programmed into the FMS.*

4. *Pilot monitoring to use the HCA[8] app on company iPads as part of the approach brief. A quick review of the picture, layout and any limitations serve as a useful prompt.*

5. *Finally, read the name on the destination and cross-check with the other pilot against GPS/FMS bearing and distance. This really is the final barrier and has prevented a number of WDL's. Pilots need to be wary of 'expectation bias'; i.e. seeing what you expect to see.'*

The last item on the final approach checklist is to identify the platform and carry out a position cross-check using the GPS. The pilots did not do these checks on their approach to the helideck.

Analysis

Factors that facilitated mis-selection of the 40C platform destination

Familiarity

Repetitive tasking for pilots on the AW189 fleet means that the field layout, platform characteristics and other factors such as turbulent or restricted sectors, become familiar, allowing them to identify the potential threats quickly during the planning phase. However, it may also result in reduced scrutiny at the pre-flight planning stage. The MATE brief seeks to assist pilots to overcome familiarity by ensuring all relevant threats are considered, but such familiarity makes it more difficult for pilots to anticipate the circumstances that might lead to a WDL.

The co-pilot's familiarity with the field and its platforms prompted him to comment on the unusually high elevation of the crane on the 40C, which triggered the discussion about the implications for the approach and landing of the position of the 40C crane.

Weather

The visibility was sufficient to enable the pilots to see the platforms relative to each other from over 15 nm away, allowing the commander to refamiliarize himself with the field layout. It is likely the pilots initially identified and correctly selected the 40D platform as the destination, and that they shared an accurate understanding of the locations of each platform. However, in good visibility pilots may place reduced emphasis on the electronic aids that can help maintain their situational awareness, thereby increasing the likelihood of confusion arising from platform similarities.

Footnote

[8] Helideck Certification Agency.

Crane discussion

The discussion about the position of the crane on the 40C distracted the pilots and probably diverted their attention from the 40D to the 40C platform.

Field layout

The field layout means that, approaching from Aberdeen, the 40A platform is behind the 40D platform, with the 40C platform in front and slightly offset to the left. Once at 500 ft, the field will present a different visual perspective from that at height. Crucially, the 40A platform is likely to have been largely obscured behind the 40D platform and the pilots would only see one platform ahead, rather than the two they would expect, with the 40C platform offset to the left. It is possible they thought they saw the 40A platform ahead with the 40D platform offset to the left, when in fact the 40D platform lay ahead and the 40C platform was offset to the left. If so, this would have contributed to the subsequent mis-selection by the pilots and strengthened their expectation that the 40C platform was the destination platform.

Flight path

The wind direction and the identical helideck alignment meant that the approach to both the 40D and 40C platforms would have been the same: offset to the south of the platform followed by a left turn onto the final approach path. Also, on approaching the 40D the pilots would have expected to offset the flight path to the right of track to facilitate the left turn on to final. Therefore, the actual flight path flown, and the picture presented by the position of the platforms, matched the pilots' expectations.

Platform characteristics

The platform infrastructure on the 40D and the 40C is almost identical.

Effectiveness of prevention controls

Use of electronic aids

Before turning onto the final approach path the course deviation bar (CDB) displayed on the HSI would have shown a cross-track error, with the aircraft offset to the right. This offset would have matched the visual picture that the pilots saw in relation to the position of the 40C platform. At the point where the PF turned the aircraft towards the 40C, the distance to the 40D displayed by the FMS would have seemed to the pilots to be a reasonable match for the actual distance to the 40C. The lack of surrounding topography made accurate visual judgement of distance offshore challenging.

In the absence of a relevant standard operating procedure, crews had been encouraged during training to select the P-PLANT page on the inboard MFD to display engine parameters, which were considered relevant information to be displayed during the final stages of an approach and landing. This meant FMS navigation data was not displayed to the PM, whereas with the HSI mode displayed on the PFD the CDB would have indicated that the aircraft was left of track, highlighting that it was heading to the wrong destination.

HLO radio call

The crane on the 40C was not stowed as expected for flight operations, but this did not on its own reveal that the 40C was the wrong deck because the crane on the 40D was similarly not stowed.

Checks on final approach

Once the turn on to the final approach was complete the focus for the PF was primarily external, with the PM focusing on the key performance instruments (N_R, IAS, engine torque), rather than FMS navigation data. Selecting the P-PLANT page during the final stages of the approach encouraged a greater focus on engine parameters and probably led to the omission of the GPS cross-check.

The PF was focused on the external hazards; in particular, that of the crane. This was the most probable explanation for not reading the name of the platform on the helideck. The PM in the right seat was unable to read the name on the helideck because the nose-up attitude of the AW189 in the final stages of the approach obscures the deck and other visual cues from that side of the helicopter.

Confirmation bias

Once the pilots had switched their attention to the 40C platform and mis-selected it as the destination, several factors may have reinforced their perception and diminished their ability to identify this misidentification. These included the similar flight path, the identical platform characteristics, visibility of signage, the cranes on both the 40C and 40D platform not being in the stowed position, and the task focus that led to the omission of the GPS cross-check and the reading of the name on the helideck. Even if the pilots had paid greater attention to the FMS track and distance, it is unlikely these cues would have been powerful enough to challenge and break the mental model which the crews had developed – that the 40C, to which they were heading, was the correct destination.

Prevention controls

The operator encourages a structured approach to threat and error management, and the use of the 'MATE' brief, to help pilots identify the correct platform. Platform identification through use of electronic aids and reading the name on the helideck prior to the committal point are considered essential amongst several prevention controls. However:

> *'Pilots will always prioritise aircraft control which means the task of [platform] identification will receive little attention and may be dropped without the pilots being fully aware that they have done so.'*[9]

Footnote

[9] Jarvis, S (2015) *Wrong Deck Landings Research and Investigation Report*, Jarvis Bagshaw Ltd page 6.

Evidently, these prevention controls have been proven not to be sufficiently robust to be relied upon as the final prevention control, since these are internal controls reliant upon the flight crew.

'Error traps involving just flight crew do not prevent all WDLs from occurring.'[10]

Once the mis-selection has occurred, more robust external controls, capable of breaking the confirmation bias and mental model of the pilots, are required to be put in place to act as the final barrier to the occurrence of a WDL.

Conclusion

The pilots landed the helicopter on the Forties Charlie (40C) platform having misidentified it as the destination platform (40D). Controls in place at the time proved inadequate to break the confirmation bias of the pilots.

Discussion between the pilots about the position of the crane on the 40C platform probably resulted in them switching their attention incorrectly to this platform and away from the 40D platform. The crane was not stowed on either platform, so did not serve as a distinguishing feature.

The pilots' familiarity with the Forties field, the physical similarity of the platforms, and the identical approach and landing flight path to each of them served to reinforce their selection of the wrong deck.

The pilots did not verify they were approaching the correct platform by cross-checking the position of the platform against the FMS bearing and distance to the destination or reading the platform name on the helideck before committing to land.

Safety actions

The operator has carried out the following two safety actions:

The operator has issued a Safety Notice to pilots highlighting four lessons learned from the incident, detailing:

- when to hand over control to the landing pilot
- the importance of pilots monitoring and cross-checking the GPS/FMS bearing and distance
- that pilots must read the platform name before committing to landing
- that pilots should wait for the cranes to be stowed even if this incurs a delay

Footnote

[10] Ibid page 42.

The operator has issued a Flying Staff Instruction amending the guidance for the '*Avoidance of a Wrong Deck Landing'* given in the operations manual to emphasise the importance of the following actions:

- the need for pilots to highlight the risk of a wrong-deck landing at both the pre-flight planning and the approach brief phase
- the need for pilots to ensure the route is fully and correctly entered into the FMS
- the use of GPS/FMS needle bearing and distance guidance to the point that the platform name is read
- the need for pilots to read the platform name and cross-check with the GPS/FMS bearing and distance prior to committing to landing on the heli-deck