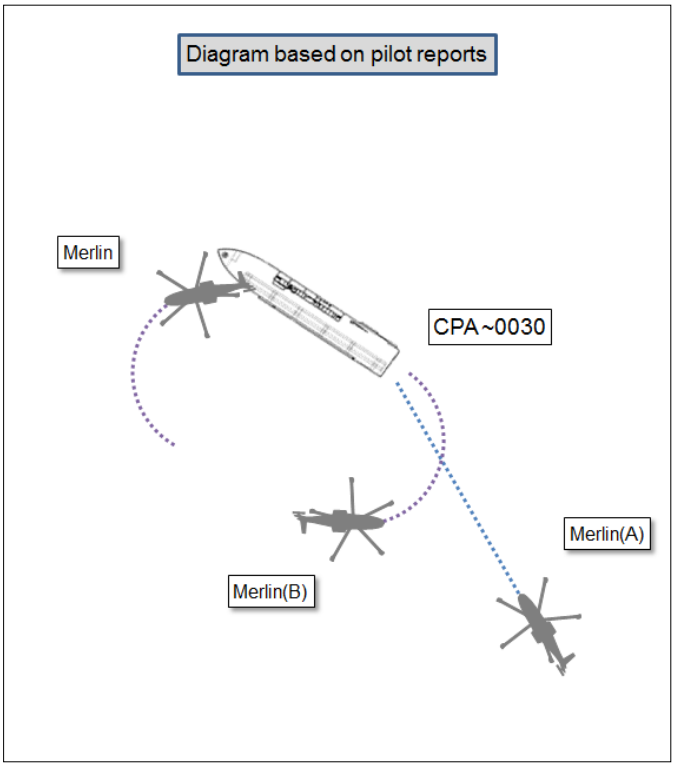
AIRPROX REPORT No 2017135

Date: 29 Jun 2017 Time: 0030Z Position: 5006N 00351W Location: 11nm SW Start Point

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Merlin(A)	Merlin(B)
Operator	MoD ATEC	RN
Airspace	London FIR	London FIR
Class	G	G
Rules	IFR	VFR
Service	NATO Broadcast	NATO Broadcast
Provider	HMS Ocean	HMS Ocean
Altitude/FL	NK	NK
Transponder	A, C, S	A, C, S
Reported		
Colours	Grey	Green
Lighting	Anti-col, nav	NK
Conditions	VMC	NK
Visibility	0km	NK
Altitude/FL	250ft	200ft
Altimeter	QNH (992hPa)	NK
Heading	305°	NK
Speed	65kt	NK
ACAS/TAS	Not fitted	TAS
Alert	N/A	TA
Separation		
Reported	0ft V/200m H	0ft V/~200m H
Recorded	NK	



THE MERLIN(A) PILOT reports conducting conventional night deck landings to HMS Ocean. The aircraft was positioned for a Ship Controlled Approach (SCA) while under a NATO Advisory service. Much of the marshalling was conducted with the aircraft IMC but, during the descent to 200ft, VMC was regained. At 1.5nm the descent was begun as usual, although both pilots felt the closure angle was more obtuse than R165[1]. At approximately 250ft, the PF (in the right seat) commented that he thought he could see another aircraft in the right 2.30 position. The PM (left seat) flicked his NVGs down and saw Merlin(B) at approximately 200m range. This was brought to the attention of the controller who called an immediate avoiding turn to the right. The crew elected not to take this due to the close proximity of the other aircraft on the right, believing that this would have decreased the safe separation between the two aircraft. The controller then called an avoiding turn to the left, by which time another Merlin aircraft in the visual circuit had come sufficiently close to the left side of the aircraft to cause the crew not to take that action either. Although the controller then called for a climb to 2000ft, the crew had identified both Merlin aircraft in the circuit, and elected to maintain safe separation visually rather than climb back into cloud. The crew were aware of both Merlins in the visual circuit but had expected the controller to have ensured the circuit was clear for their approach. The pilot noted that the workload was sufficient to keep crew stimulated, but not over-worked, and that light levels were poor, with about 0.5mLux predicted and GRN[2] met conditions.

He assessed the risk of collision as 'High'.

THE MERLIN(B) PILOT reports being in the port visual circuit at 200ft and about to turn onto final. Flight Control (FLYCO) called to state that there was instrument traffic approaching 3 miles. In accordance with HMS Ocean procedures, instrument traffic inside 2 miles has priority over visual circuit traffic and, with the traffic at 3 miles, a turn onto finals was commenced. As the aircraft

[1] 165° left of the ship's bow.
[2] Green weather colour code: Minimum visibility 2-2.7nm and/or lowest SCT or more cloudbase 700-1500ft.

intercepted the glide path indicators, the navigation lights were changed from steady bright to flashing bright and the upper anti col light turned from red to off in accordance with normal ship procedures. Shortly after this, the TAS audio sounded and, 3secs later, Merlin(A) passed down the left side, about 10 rotor spans away and proceeded between their aircraft and [another Merlin] at the end of the downwind leg. The Merlin(B) crew commented that it was strange that an aircraft would overshoot from an SCA through the circuit. They were given no explanation from FLYCO as to what had just occurred and continued with their Conventional Deck Landing training. Having read the DASOR and spoken to the Merlin(A) aircraft commander, the Merlin(B) pilot noted that had the instructions given by the controller been followed then a collision with either his aircraft or the other Merlin in the circuit would have been highly likely. He stated that they were thankful the experienced crew in Merlin(A) looked before following the instructions given.

THE HMS OCEAN RADAR CONTROLLER (HOMER) reports that Merlin(A) contacted him for an SCA. After completing the base and downwind legs at 700ft and all the admin checks as required, the controller turned Merlin(A) inbound towards the ship and descended the aircraft to 500ft amsl to begin the final part of the SCA on the ship's relative bearing of R165. Merlin(B) was airborne on the downwind leg of a visual circuit under the control of FLYCO. At 2.1nm, the controller ordered Merlin(A) to reduce speed to 65kt and not to acknowledge further instructions until requested. At this point, Merlin(B) had turned finals towards the ship at 200ft amsl and the traffic was called to Merlin(A), who was now at 1.9nm, by the controller. The Merlin(A) pilot reported visual. The SCA continued as planned but the controller noticed on radar that Merlin(A) appeared not to have fully reduced speed and continued to close on the circuit traffic which was now on short finals. The approach was continued and a clearance request was made at 1 mile, at which point a 'continue' was given by FLYCO. By the time the break-off procedure was executed by FLYCO at ½nm, passed to the controller and subsequently relayed to Merlin(A), the pilot had broken-off his approach, taking a heading to the left into the visual circuit before the controller issued an overshoot instruction to the right (of a heading of about 040-050° and to climb to 700ft). The pilot chose not to take the overshoot instruction to the right stating he had an aircraft to his right (Merlin(B)), so the controller issued a further overshoot instruction to the left and climb to 700ft. The pilot elected not to take the instruction either stating he had an aircraft to his left at 9 o'clock. The pilot carried out his own overshoot procedure of 260° and climb to 700ft and an Airprox was declared.

THE HMS OCEAN CDR FLYING (FLYCO) reports that, whilst conducting night operations, a Merlin pilot [Merlin(A)] declared an Airprox near the end of an SCA. This was in response to a perceived threat from an aircraft ahead whose pilot was cleared to land. The aircraft had already conducted a night SCA and then conducted 2 further visual serials including a hold on deck. During this time 2 other Merlins joined approximately 50 minutes early and held in the starboard wait. With Merlin(A) on deck, the other Merlins where fed in individually and conducted SCAs before joining the port visual circuit. Merlin(A) then launched into the next serial which was an SCA to overshoot into an practice Emergency Low Visibility Approach (ELVA). During the SCA, Merlin(A) was IMC at 700ft before regaining VMC at an estimated 500ft. Once fed in to the SCA pattern, the aircraft was positioned on the R165 with a relative wind of R20[3] at 30kts. As Merlin(A) approached 2.5nm, Merlin(B) was turning finals in the visual circuit. The radar controller called traffic ahead at 1.5nm which was acknowledged by the Merlin(A) pilot. In so doing, the 2nm call was missed internally but, at this point, Merlin(A) was told to reduce speed to 65kts by the radar controller, which was acknowledged. Merlin(A) was reported at 1nm and given a continue with one ahead. No clearance to land was given due to Merlin(B) on short finals approaching the deck. Merlin(A) was observed to close rapidly with Merlin(B) at ½nm and reported that they were breaking off the approach. The break-off procedure was being initiated at ½nm as Merlin(A) broke left into the circuit. The pilot was instructed to overshoot right but declined to follow this instruction so was instructed to overshoot left. This would have put them into conflict with the other Merlin, who was downwind at this point. They were given a third instruction to climb to 2000ft which was also refused as the pilot was visual with both other Merlins and passed clear. The Merlin(A) pilot declared an Airprox.

He perceived the severity of the incident as 'Medium'.

[3] 20° left of the ship's bow.

Analysis and Investigation

UKAB Secretariat

The weather in the vicinity of HMS Ocean was reported as a clear night below a 600ft cloud base with some moderate rain and poor light levels.

The Merlin(A) and Merlin(B) pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard[4].

Occurrence Investigation

The decision to allow the Mk3 Merlins to join earlier than expected (thereby increasing the relative complexity of the night serial earlier than was originally planned at the night flying briefing), was considered during the investigation as contributory; however, on balance, it was deemed safe to increase the workload. The investigation concluded with a number of findings:

1. Better lookout whilst in the visual circuit. All air systems were displaying normal lighting and this should have enhanced visual deconfliction if one pilot was looking out with the other adopting the heads-in mode.
2. Better communication between the HOMER and FLYCO would have aided the serial throughout. Missed internal liaison calls at 2nm undoubtedly contributed.
3. All crews should operate with NVG for SA in a multiple aircraft visual circuit.
4. The decision to not turn on TCAS outside of the visual circuit meant the loss of a possible source of SA.
5. Of note was the tightened timelines dictated by the requirement to achieve currency in an environment where lack of assets for multi-spot evolutions competed with other FLEET priorities.

In sum, there are valuable lessons to be learned from this incident. However the serial was covered by the staff of Flag Officer Sea Training who assessed the serials as “a well executed set of FLYEX serials demonstrating a strong level of supervision and exposure of junior personnel to aviation”.

Comments

HQ Air Command

This Airprox involved 3 aircraft all under control of HMS Ocean and took place during a busy time of training for both the ship’s company and aircrew. The 3 aircraft were a mixture of 2 aircraft in the circuit (VFR) and one making an approach (IFR). The crew of Merlin(A) were completing their approach without the use of night vision devices. However, the devices were attached to their helmets but stowed in the ‘up’ position. This allows them to be flipped down immediately if required, and, in this case, the crew were set up for the NVG circuits they were planning to do later in the sortie. Crews do not normally operate with one pilot on NVG and one conventional, especially during maritime operations, because the ship’s lighting configuration can only be set to suit one or the other. Lights which are dim enough to not dazzle or bloom the NVG are too dim to be seen unaided. Some lights (for example masthead obstruction lights or restricted-in-ability–to-manoeuvre lights) are not NVG compatible at all, so need to be turned off for NVG use. Within a crew, it should be all or none when it comes to switching to NVG, and all crew members will all be on the same standard of NVG. That said, it is not entirely unusual for the LHS occupant to have their NVG down for some of the circuit – because once away from the ship they offer improved capability – and then re-stow them in the ‘up’ position once the ship’s lighting causes degradation in the performance of the device. Crews from a Merlin Mk 2 Maritime Helicopter Force (MHF)

[4] SERA.3205 Proximity.

background would normally be flying with neither pilot on NVG because much of MHF is not yet NVG trained. This is a slightly unusual factor of this incident because the crew of Merlin(A) were flying a Merlin Mk 2 but the crew were all NVG trained. The crew of Merlin(A) was aware that the Commando callsigns were in the circuit, and had been informed about the one turning in ahead earlier in the approach, but had no other traffic information about their positions. As they were intermittent IMC during the marshalling, they were not able to see either aircraft until the incident point. The crew of Merlin(A) were caught by surprise when they became visual with Merlin(B) because they expected it to be closer to the ship or in the hover alongside. Fortunately, when the HP announced that he thought he could see an aircraft in the 2.30, the LHS occupant was able to flip his goggles down and rapidly acquire the conflicting aircraft and give more accurate range information to the HP than would have been possible without the aid of the goggles. The HP manoeuvred to increase separation and ATC was informed. During the moments that passed, the crew of Merlin(A) were more confident in their own SA regarding the 2 circuit traffic aircraft and were content to take their own path between the aircraft rather than follow the ATC directions which were at this time based on information that was obsolete due to the avoiding action of Merlin(A). Unfortunately, the ship's recording equipment wasn't working at the time; however, the combined reports of all participants allowed the investigation to gather the required information. Mixing circuit traffic with IFR traffic will always be challenging, especially with a relatively small circuit; however, the ship's company and aircrew need to train as they fight. It is heartening to see several recommendations submitted in order to improve integration and safety.

Navy HQ

For this particular occurrence, there are a couple of contributory factors that may have resulted in the Airprox developing more than it should have done; however, without a tape transcript it is difficult to know for sure how accurate the flow of information was for all concerned to build accurate SA. This is a separate issue that is being addressed by HMS OCEAN engineering staff because the ability to record ATM (and indeed Action Information Organisation activity) is a mandated requirement but appears to have failed on this occasion. The decision to allow Merlin(A) to proceed beyond "The Gate" during the SCA might have been flawed; however, if neither controller had an accurate mental model of the relative positions of all aircraft concerned, then this could be understood. That said, on approaching the flight deck at night, it goes without saying that Merlin(B) would reduce in speed significantly as it comes adjacent to the spot it was intending to land on, and this would have no doubt increased the perception that the overtake speed of the Merlin(A) was significantly more than 65kts. Due to the lack of currency of the controllers concerned, this explains the lack of awareness displayed initially during this incident. In this instance the situation was aided by the visual acuity of the crew of Merlin(A) who were able to take visual separation from the conflicting visual circuit traffic and take an appropriate course of avoiding action.

Summary

An Airprox was reported when 2 Merlins flew into proximity in the HMS Ocean visual circuit pattern at about 0030 on Thursday 29th June 2017. Both pilots were operating clear of cloud under VFR in VMC, both in receipt of a NATO Advisory Service from HMS Ocean.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, reports from the air traffic controllers involved and reports from the appropriate operating authorities.

Further information was provided by the HQ Navy Operations member, who stated that HMS Ocean was conducting a pre-deployment work-up, operating under standard NATO rules, and that consequently the crew were current but lacked recent experience; the reason for the work-up. Members first considered the actions of the ATM team on HMS Ocean and, after some discussion, agreed that it appeared that the internal coordination call between HOMER and FLYCO of SCA traffic at 2nm had been missed and that this was contributory. Notwithstanding, members noted that the

Merlin(B) pilot had stated that he was advised of traffic at 3nm before turning final, and FLYCO observed that Merlin(A) was approaching 2.5nm as Merlin(B) turned final. As such, it seemed that all involved knew that Merlin(A) was making an approach, if not its precise range at the 'Gate' which would have been the cue for a decision to be made on whether to allow Merlin(A) to continue towards the deck.

The Board also noted that both FLYCO and HOMER stated that Merlin(A) appeared to close rapidly on Merlin(B), suggesting that Merlin(A) pilot had not slowed to the required 65kt. Members discussed this possibility and felt that it would have been surprising, given his training and previous experience, that the serving naval officer test pilot flying Merlin(A) would make such an error. It was felt that it was more likely that the internal coordination within the ATM team was such that the apparently sudden arrival of Merlin(A) in the visual circuit created a perception that it had not slowed on the approach.

Some members wondered why Merlin(A) had been cleared to continue at 1nm when Merlin(B) was ahead on short final with another Merlin on the downwind leg, and commented on the little time available for FLYCO to order a break-off to HOMER at ½nm, to be passed to Merlin(A) pilot. The HQ Navy Operations member pointed out that the ship's radar resolution was such that HOMER would not be able to distinguish separate aircraft in the circuit area, and it was therefore incumbent upon FLYCO to control approaches when aircraft were close to the ship. Furthermore, he went on to say that the command at ½nm to break-off the approach was made in error; the Merlin(A) pilot should have been given break-off instructions at the 'Gate' – 2nm.

The Board agreed that the early arrival of the Merlin pair had caused an unexpected and rapid increase in the complexity and intensity of flying operations, at night and in poor weather conditions, which had resulted in a breakdown in communication within the ATM team, which members also agreed was contributory. Given that the Merlin(A) pilot should have been passed break-off instructions at 2nm, it was felt that the cause of the Airprox was that FLYCO had allowed the Merlin(A) pilot to fly into conflict with Merlin(B). Turning to risk, members acknowledged that HOMER had passed standard overshoot instructions to Merlin(A), albeit at a time and location for Merlin(A) which was inappropriate and which, had they been followed by an inexperienced crew, would have resulted in further erosion of the separation. It was fortunate that the Merlin(A) pilot's experience and competence was such that he was able to afford the capacity to process the overshoot instructions, assess their effectiveness and make a plan of his own in order to deconflict from the other 2 Merlin helicopters. In the event, the Merlin (A) crew had established late visual contact with Merlin(B) and, whilst some members felt that the risk of collision was averted, the majority felt that safety had been much reduced below the norm.

PART C: ASSESSMENT OF CAUSE, RISK AND SAFETY BARRIERS

Cause: The HMS Ocean FLYCO allowed the Merlin(A) pilot to fly into conflict with Merlin(B).

Contributory Factors: 1. Lack of co-ordination between HOMER and FLYCO.
2.Complexity and intensity of flying operations unexpectedly increased, which led to a breakdown in communication in the ATM team, still working up to full currency prior to operational deployment.

Degree of Risk: B.

Safety Barrier Assessment[5]

In assessing the effectiveness of the safety barriers associated with this incident, the Board concluded that the key factors had been that:

ANSP:

Regulations, Processes, Procedures and Compliance were assessed as **partially effective** because the missed 2nm call compromised the controllers' SA.

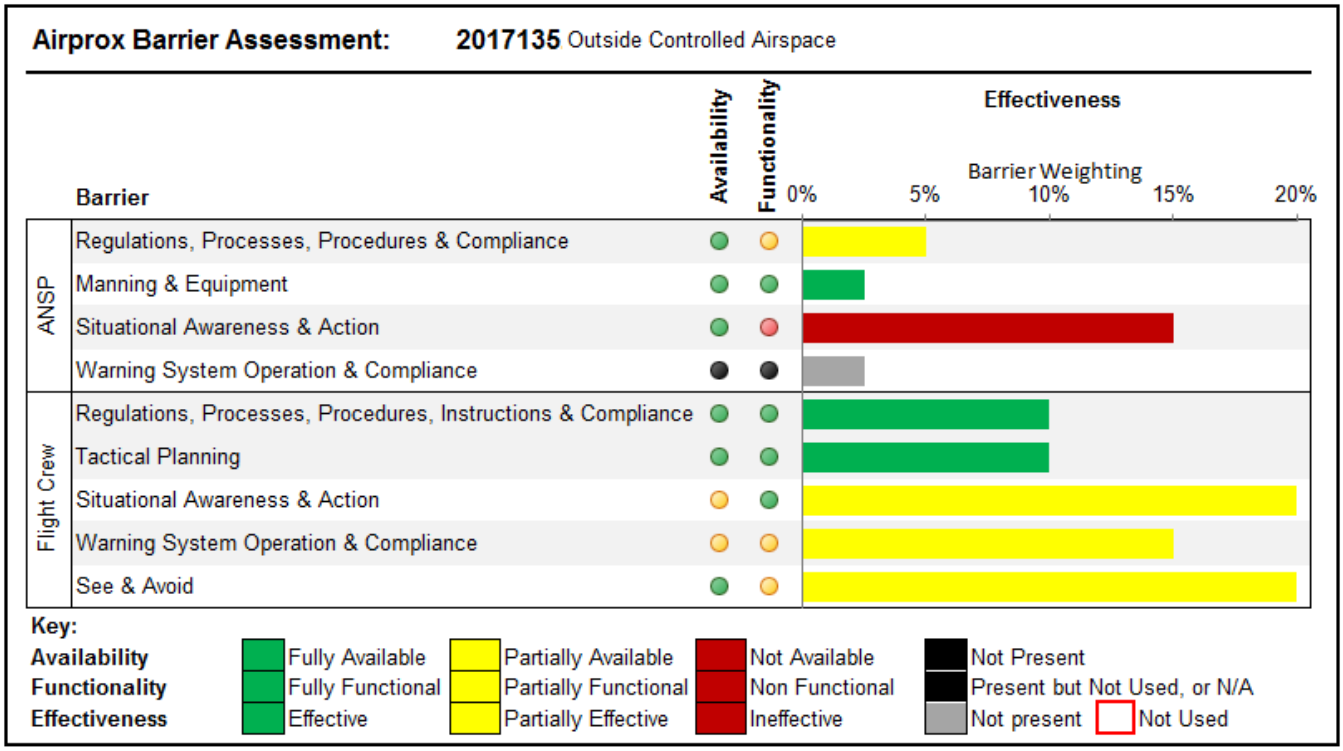
Situational Awareness and Action were assessed as **ineffective** because the controller first directed the Merlin(A) pilot to overshoot towards Merlin(B), and then towards the other Merlin in the visual circuit.

Flight Crew:

Situational Awareness and Action were assessed as **partially effective** because neither Merlin crews were aware of the proximity of the other until at a late stage; the Merlin(A) crew did not have specific SA on the location of Merlin(B), and the Merlin(B) crew only knew that Merlin(A) was somewhere on the approach until his TAS alerted only 3 seconds before the Merlin(A) passed.

Warning System Operation and Compliance were assessed as **partially effective** because only one Merlin was equipped with TAS (Merlin(B)), which did alert but at a point when effective avoiding action may have been compromised.

See and Avoid were assessed as **partially effective** because the Merlin crews saw each other at a late stage, and only the Merlin(A) pilot was able to conduct effective avoiding action.



[5] The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the UKAB Website.