

AIRPROX REPORT No 2011126

Date/Time: 24 Sep 2011 1030Z (Saturday)

Position: 5052N 00018W (2.4nm
N of Shoreham Airport -
elev 7ft)

Airspace: London FIR (Class: G)

Reporting Ac Reported Ac

Type: R22B BE90

Operator: Civ Pte NK

Alt/FL: 650ft↑ NK
QNH (1014mb) NK

Weather: VMC CAVOK NK NK

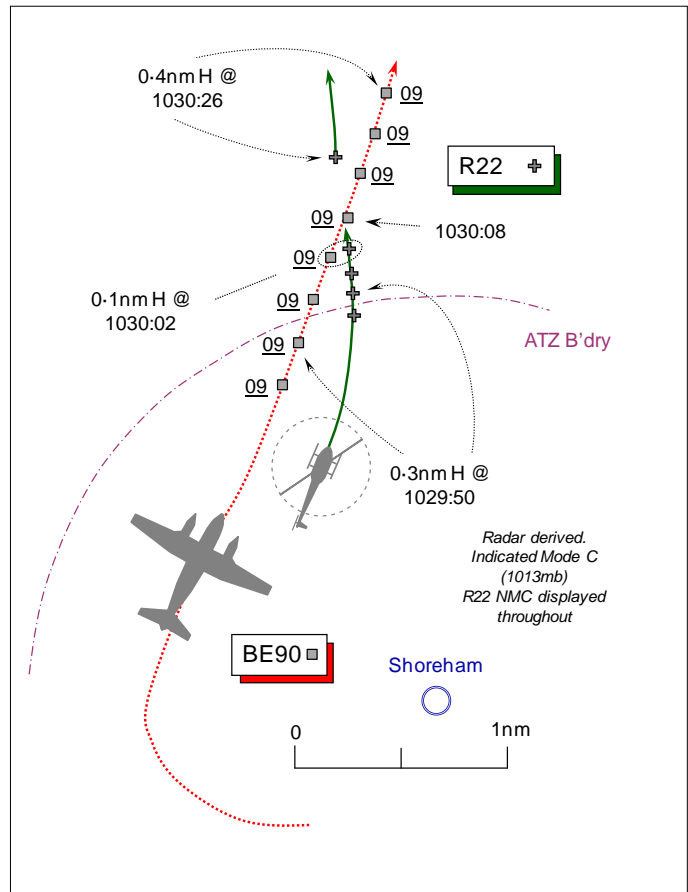
Visibility: >10km NK

Reported Separation:

80-100ft V/nil H NK

Recorded Separation:

<0.1nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE ROBINSON R22B HELICOPTER (R22) PILOT reports that he had departed from Shoreham on a local 'hours building' VFR flight with a passenger who also has flight experience. He was in communication with Shoreham APP on 123.150MHz under a 'controlled' ATS. A squawk of A7000 was selected with Mode C on, he thought. [However, no Mode C was evident on recorded radar throughout the incident.] Neither TCAS nor Mode S are fitted. His helicopter has a dark-blue colour-scheme; the HISLs were on.

After a 10-15minute delay between his initial call and a departure clearance being given, he lifted and hover-taxed to point X-ray, whence he departed into a SW'ly wind with a R turnout to the N, crossing RW20 and climbing. APP had given him a 600ft height limit in the zone which he adhered to. Shortly after crossing the ATZ boundary at the cement works heading N, following his post take-off cockpit checks, he began to reduce airspeed and pull in power to begin his ascent to his planned cruising altitude of 1200ft. Climbing through 650ft QNH (1014hPa) at an IAS of 70kt, he suddenly noticed a BE90 King Air directly O/H flying from directly astern straight and level about 80-100ft above his helicopter, as estimated by himself and his passenger at the time of the Airprox. He lowered the collective to avoid the BE90, which then began a turn to the R. He assessed the Risk as 'high', but following the Airprox carried on his flight 'as normal', routeing N towards Dunsfold A/D before returning to Shoreham. On completion of his post-flight documentation, he spoke to two instructors who advised him to call ATC on the telephone to report the Airprox, which he did.

UKAB Note (1): Despite repeated requests from the UKAB Secretariat and several indications that an account would be provided, to date the Beechcraft King Air BE90L (BE90) pilot has not submitted a report.

THE SHOREHAM COMBINED AERODROME AND APPROACH CONTROLLER (ADC) reports that the runway in use was RW20. The R22 had cleared to the N VFR when the BE90 pilot, operating VFR, in the RH cct was told to extend downwind. The BE90 pilot asked to turn R base and was given permission to do so, whilst the ac was at the ATZ boundary. The R22 was ascending from

600ft also at the ATZ boundary. The King Air descended in the cct for a 'touch and go' and the two ac passed with about 100ft vertical separation. TI was not issued.

ATSI reports that the Airprox occurred at 1030:06UTC, 2.4nm to the NNW of the Shoreham Aerodrome Reference Point (ARP), within Class G airspace and just outside the Shoreham ATZ, which is a circle, radius 2nm, centred on RW02/20 and extending to 2000ft above the aerodrome elevation of 7ft.

The pilot of the R22 helicopter was departing from Shoreham to the N on a local VFR flight. The BE90 King Air was operating VFR in the right hand visual cct for RW20, in order to complete a pre-arranged requirement to film the ac.

The Shoreham controller was operating a combined Aerodrome and Approach Control position, without the aid of surveillance equipment; his workload was assessed by ATSI as high. A left hand traffic pattern at 1100ft aal was also in use on RW20, with helicopter operations up to 600ft aal on the W side of the A/D. Aircraft were joining overhead at 2000ft aal and the controller was also utilising 1600ft for some ac joining downwind. The controller had also agreed a departure from RW13. The BE90 was instructed to operate in the right hand circuit (RHC) for the filming exercise. The UK AIP page AD 2-EGKA-1-7 (29 Jul 10), paragraph 6, states:

- c) Circuit heights are 1100ft aal for all runways.
- d) Variable circuits at discretion of ATC.
- e) Unless otherwise instructed ac joining the circuit will overfly the aerodrome maintaining 2000ft aal, until instructed to descend to circuit height on the inactive (dead) side of the runway in use and join the circuit by crossing the upwind end. Pilots should note that there would frequently be helicopters operating both 'liveside' and 'deadside' in the ATZ up to 600ft.

ATSI had access to NATS Ltd radar recordings provided by Swanwick, together with written reports from the R22 pilot, the controller and the ATSU investigation report. No report has been received from the BE90 pilot. To reflect the controller's busy workload, the number of RT transmissions between calls from the subject ac has been included in brackets.

The Shoreham 1020Z METAR: 18007KT 9999 SCT017 18/14 Q1014= (QFE 1014).

The BE90 had been operating the previous day and had arranged permission with the Shoreham controller to complete an hour's filming exercise, which involved the BE90 completing visual circuits whilst a film crew, located on the W side of the A/D, filmed the ac. The controller commented that he had hoped that the BE90 would start earlier than was the case, but no time had been agreed. The cct was active when the BE90 called for start with two slower ac in the left-hand circuit (LHC) for RW20. Because of the speed differential the controller decided to put the faster BE90 into a RHC.

At 1015:07, the BE90 was operating in the right-hand circuit for RW20, when the R22 helicopter pilot called for lift, *"..is an R 22 two P O B outside of [Company] request lift..and for a departure to the North for a local flight"*. The controller was busy and responded, *"[R22C/S] just hold position there Break....."* The controller then cleared another ac for take off.

[26 transmissions in the next 1.5 minutes.]

At 1016:53, the BE90 pilot called, *"passed..downwind abeam"* and the controller replied *"and break [BE90 C/S] number 1 report final."* This was acknowledged, *"Roger will report final number 1 [BE90 C/S]"*.

[12 transmissions in the next 50 seconds.]

At 1017:50, the BE90 pilot reported on Final and was instructed to continue approach.

After a broken transmission the BE90 was cleared for a touch and go, “[BE90 C/S] *clear touch and go into the righthand circuit wind 1-7-0/7.*” The BE90 responded, “*Clear touch and go.*”

[25 transmissions in the next 1.5 minutes.]

At 1019:34, the R22 pilot called, “*????? outside [Company] ready to lift for a northerly departure.*” The controller replied, “[R22 C/S] *air taxi line up..correction cross 2-5 to X-ray.*” The R22 pilot acknowledged, “*Lift and cross 2-5 to X-ray [R22 C/S].*”

[6 transmissions in the next 20 seconds.]

At 1020:03, the BE90 pilot reported, “*just passed downwind abeam.*” The controller replied, “*Break [BE90 C/S] can [you] extend downwind on the right hand leg.*” The pilot replied “*will extend.*”

[20 transmissions in the next 1 minute 20 seconds]

At 1021:30 the BE90 pilot called “[BE90 C/S] *are we clear for base*” and the controller responded “*not yet sir no*”. The BE90 pilot responded, “*and say again...*”, whereupon the controller transmitted, “[BE90 C/S] *and turn base now you’ll be number 3 following 2 Cessnas on final.*” The BE90 replied, “*Cessnas in sight turning base [BE90 C/S].*”

[3 further transmissions.]

At 1021:58, the R22 pilot called ready and was asked to hold position.

At 1022:12, the controller transmitted to an ac which had shut down on the taxiway. The controller indicated that this had been a distraction and required the oncoming controller to delay taking over, in order to arrange for the ac to be moved off the taxiway.

[11 transmissions in the next 36 seconds.]

At 1022:56, the BE90 pilot called on a long final and was instructed, “[BE90 C/S] *roger number 2 following the Cessna ahead who’s making a touch and go.*” The pilot acknowledged “*Roger following the Cessna.*”

[19 transmissions in the next minute.]

At 1024:12, the controller transmitted to another ac followed by, “*...break [BE90 C/S] clear touch and go into a right hand circuit wind 1-8-0/7.*” The BE90 pilot replied, “*Clear touch and go [BE90 C/S].*”

[21 transmissions in the next 1 minute 10 seconds.]

At 1025:25, the R22 called again, “[R22C/S] *at X-ray an ready for departure.*” The controller replied, “[R22C/S] *hold position.*” The pilot acknowledged, “*Holding position.*” The controller gave another ac clearance for touch and go.

At 1025:39, an inbound ac requested an RNAV approach for RW20. This was approved by the controller and the pilot was asked to report at BITLI with a conspicuity squawk A0401 and a Procedural Service was agreed. This was acknowledged.

Another ac was cleared for a touch and go and shortly afterwards the BE90 was cleared to final number 1. An ac was instructed to line up RW20.

[7 transmissions.]

At 1026:52, the R22 was advised, “[R22 C/S] *after that Cessna on your righthand side clear for take off cross 2-0 to the west caution the 1 at..the sloping ground.*” The R22 pilot replied “*Clear for take off after the er the landing Cessna er caution the helicopter on Whiskey [R22 C/S]*”.

[3 transmissions.]

The controller called the R22, “*take off now please immediate*” and the pilot responded, “*Clear for take off [R22 C/S] crossing 2-0 right turn out.*”

[2 transmissions.]

At 1027:26, the BE90 pilot called joining final and was instructed to continue approach.

The controller was waiting for the R22 helicopter to depart from X-ray across RW20 before giving a take off clearance to another light ac on the runway . The R22 had been slow to cross and the controller judged that there was not sufficient spacing to depart the light ac with the BE90 on short final.

At 1027:35, the controller transmitted, “*and [BE90 C/S] it’s not gonna work go around not below 4 hundred feet maintain Runway centreline.*” The BE90 pilot responded, “*er we’re already below 4 hundred we’re at 3 hundred feet going around on the centreline [BE90 C/S]*”. The BE90 continued straight ahead and the R22 tracked N. The controller indicated that at this point the two ac were going in opposite directions and he did not consider that TI at this point was necessary.

[27 transmissions.]

At 1029:28 the BE90 called, “[BE90 C/S] *ready for base.*” The controller replied, “[BE90 C/S] *extend downwind you’re number 3 number 2 is a Cherokee on leftbase.*” The BE90 pilot acknowledged, “*extending number 3 [BE90 C/S]*”.

[At 1029:50, radar recordings show the R22 tracking NNW and leaving the ATZ with no Mode C level reporting evident. The BE90 was in the R22 helicopter’s 8 o’clock position at a range of 0.3nm and converging maintaining 900ft (1013hPa) – about 930ft QFE.]

The controller indicated that at this point the R22 was no longer in sight and he considered that it was operating to the N of the ATZ. The controller acknowledged that TI in general terms would have aided the situational awareness of both pilots.

At 1030:08, radar recordings show the BE90, crossing ahead of the R22 from L - R at a range of less than 0.1nm. The BE90 was indicating 900ft Mode C - about 930ft QFE 1014. No report has been received from the BE90 pilot and it is not clear if the pilot had acquired the R22 visually as the BE90 extended downwind.

At 1030:18, the controller instructed the BE90, “*.. turn base your traffic about to turn one and a half mile final.*” The pilot replied, “*Roger [BE90 C/S] turning base.*”

[33 transmissions.]

At 1031:40, the BE90 reported, “[BE90 C/S] *..1 mile.*” The controller replied, “[BE90 C/S] *continue approach the 1 ahead is..making a touch and go.*” At 1032:01 the BE90 pilot was cleared for a touch and go.

The BE90 continued in the cct and at 1032:38, the R22 requested a frequency change to Farnborough.

Neither of the two pilots reported the incident to the controller on RT. The R22 pilot subsequently telephoned Shoreham ATC and reported the Airprox.

The controller stated that traffic levels started as light, increasing to medium and did not consider it was necessary to introduce traffic management measures. The controller agreed that RT recordings showed that traffic levels prior to the Airprox had gradually increased, but believed that TI had not initially been passed because the two ac were departing in opposite directions.

The controller was operating a combined Aerodrome and Approach Control position and commented that he was unable to split the positions because no staff were available.

As a result of this incident and the ATSU's own investigation, the Unit considered that workload was a factor and issued a MATS Pt2, Supplementary Instruction 01/2011, which states:

'This SI is to be read in conjunction with Shoreham MATS 2 and serves to remind all ATS staff of the need to regulate traffic as necessary in order to avoid a traffic overload situation. This may mean for example:

Saying no to circuits or landing circuit traffic.

No to IFR training traffic.

Holding traffic outside the ATZ, asking them to call in 10 minutes, etc.

Limiting the use of runways to ONE only and advising ac requesting other runways of the delay or unavailability of the runway at that time as per MATS Pt 1.

Limiting helicopter training if this impacts in a negative way.

Reducing the traffic as you need to subject to your experience levels, the weather, events etc.

The traffic situation at Shoreham is highly dynamic and the complexity depends on numerous factors such as weather, the number of students involved, the mix of slow and fast traffic, etc. As such it is not appropriate to lay down a fixed number of ac to be worked at any one time. ATCOs and ATSAs should use their judgement, taking into consideration both present and future situations as far as practicable.'

The Manual of Air Traffic Services (MATS) Part 1, Section 2, Chapter 1, paragraph 2.1, states:

'Aerodrome Control is responsible for issuing information and instructions to ac under its control to achieve a safe, orderly and expeditious flow of air traffic and to assist pilots in preventing collisions between:

a) ac flying in, and in the vicinity of, the ATZ;

b) ac taking-off and landing.'

The controller was operating a complex cct pattern whilst operating a combined aerodrome and approach position. Left and right hand ccts to RW20 were in use. The controller allowed a departure from RW13 and as traffic levels and his workload reached a high level, the controller accepted instrument traffic for an RNAV approach. A parking ac had shut down on the taxiway, which was a distraction and required the oncoming controller to leave the Tower to resolve the issue.

This experienced Shoreham controller believed he was accustomed to handling such levels of traffic. Whilst the controller believed that the workload was only medium, ATSI considered that workload was excessive and a significant factor in the controller's ability to recognise the potential for conflict and the need for pertinent TI. An excessive workload can result in a situation when an overworked controller may: have difficulty in maintaining situational awareness; overlook a developing unsafe situation; make errors of judgement; become confused or be unable to cope with a sudden increase in workload. The traffic levels at Shoreham are affected by weather, seasonal factors, weekends, training and instrument training requirements, runway in use and helicopter operations. Forward planning is essential in identifying busy periods and determining the optimum traffic management measures, rather than reacting to circumstances, when it may be too late.

Notwithstanding the fact that the controller did not pass TI, both pilots were aware that the cct was busy. It is not clear why the two ac did not acquire a visual sighting of each other. The CAA Safety Sense Leaflet 13a (June 2005), which is based on the ICAO Circular 213-AN 130, states:

'See-and-avoid' is recognised as the main method that a pilot uses to minimise the risk of collision when flying in visual meteorological conditions. 'See-and-avoid' is directly linked with a pilot's skill at looking.'

The Rules of the Air Regulations (2007), Section 4, General Flight Rules, states:

'Avoiding aerial collisions

Rule 8 (1) Notwithstanding that a flight is being made with air traffic control clearance it shall remain the duty of the commander of an ac to take all possible measures to ensure that his ac does not collide with any other ac.

Converging

Rule 9 (3) ...when two ac are converging in the air at approximately the same altitude, the ac which has the other on its right shall give way.'

The Shoreham controller's ability to provide an appropriate level of service to the ac under his control was affected by the increased levels of traffic, workload and RT loading. The controller approved multiple runway departures, with two directions of cct pattern on RW20, together with helicopter operations at 600ft. This allowed a complex situation to develop with RT loading reaching saturation levels and resulted in the controller not detecting the potential for conflict. The controller did not pass traffic information to either ac that would have aided the situational awareness of both pilots, in order to assist them in preventing collision whilst operating within, or in the close vicinity of the ATZ.

The following were considered to be contributory factors:

The controller was not aware and did not recognise that traffic levels were increasing to the point when traffic management measures were appropriate.

The two ac were travelling in opposite directions after departure [the R22 to the N and the BE90 executing the go-around on RW20. When the BE90 turned downwind, the R22 helicopter was no longer visual to the controller.

The R22 helicopter had crossed the ATZ boundary to the north and the BE90 pilot was instructed to extend downwind which took the ac outside the ATZ.

Notwithstanding the absence of TI, both pilots were operating in Class G airspace outside the ATZ [but in the vicinity of the ATZ boundary]. The R22 helicopter pilot did not acquire the BE90 ac visually, until they were in close proximity. It is not known if the BE90 pilot sighted the R22 helicopter.

ATSI Recommendations:

- a. It is recommended that the ATSU in consultation with SRG, review the levels of staffing and service provision, to ensure that Aerodrome and Approach control services can be provided from separate position when warranted.
- b. It is recommended that the ATSU in consultation with SRG, ensure that the controller is suitably apprised of the issues raised by this Airprox.

c. It is recommended that the ATSU review the guidance for operational staff in predicting, managing and limiting traffic levels, with an emphasis on the human factor effects of overload and highlighting the need for early planning and preventative measures.

d. It is recommended that the ATSU remind controllers of the requirement to pass TI to ac flying in and in the vicinity of the ATZ to achieve a safe, orderly and expeditious flow of air traffic and to assist pilots in preventing collisions.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the R22 pilot (see Post Meeting Note, below), transcripts of the relevant RT frequencies, radar video recordings, reports from the air traffic controller involved and from the appropriate ATC authority.

The Board discussed the workload experienced by the combined ADC/APP controller and agreed that he was overloaded. Members recognised that the onset of an overload situation can be insidious, once reached it is a difficult situation to resolve singlehanded and it was clear there were no additional personnel available to assist. Although the oncoming controller might have been able to help when he arrived in the VCR, he had been sent to deal with the ac that had shut down on the taxiway adding another distraction to the overloaded ADC who was operating a very complex traffic scenario indeed. The ATSI advisor mentioned the recommendations made to address the staffing levels at Shoreham and that manning levels are being closely scrutinised by CAA SRG, especially the issue of 'splitting' the ADC and APP positions when appropriate. The Board was briefed that the ADC now recognised that traffic management measures should have been implemented to reduce the traffic flow to more manageable proportions and the SI issued by the Unit had illustrated what might be done.

Thus the Board understood the background to this Airprox was one of a large amount of traffic, flying diverse patterns on the aerodrome when the ADC instructed the BE90 to extend downwind in the RH cct as No3 in the sequence and follow another aeroplane in the LH cct. Noting that 'variable' ccts are specified in the AIP, a pilot Member who operates at Shoreham advised that the RH cct to RW20 is very rarely used for fixed-wing ac and therefore the R22 pilot might not have encountered traffic here before. Because the faster BE90 was overhauling his helicopter from directly astern, the R22 pilot would not have been able to see it at all until it was at close quarters above his helicopter. Thus the appearance of the BE90 overhead would have come as a surprise unless the R22 pilot had been paying close attention to the RT and developed his SA from the instructions passed by the ADC to the BE90 pilot; the R22 pilot's account gave no indication at all that he was aware of the other ac from the RT transmissions and Members agreed that, given the rapidity and quantity of RT, it would have been extremely difficult for the R22 pilot to develop an accurate mental air picture and anticipate the appearance of the BE90 above him. Moreover, even if he had detected the ADC's extend downwind instruction to the BE90 pilot, without TI, the R22 pilot had no way of knowing the BE90 pilot would fly outside the ATZ. It was not unreasonable, therefore, that with no prior warning of other ac in the vicinity that the R22 pilot should initiate his climb clear of the ATZ to his transit altitude of 1200ft. However, a warning call, if he could get in on the RT, advising that he was leaving the ATZ and initiating his climb might have been appropriate and prompted the BE90 pilot to look for the R22.

In the absence of an account from the BE90 pilot (see Post Meeting Note), it was not clear to the Board whether he had seen the R22 helicopter before he overtook it some 80-100ft directly below him, the R22 pilot estimated. The Board was aware that the R22 helicopter's small size makes it difficult to see, so tail-on, below the horizon and against the landscape, it would have been very difficult to acquire indeed, especially with no prior warning of its presence. The radar recording reflected that both ac were outside the ATZ, some 2.4nm N of the A/D when the BE90 passed within 0.1nm – 185m – of the R22. It seemed inconceivable that the BE90 pilot would have flown this close if he had seen the small R22 and some pilot Members surmised that he had not seen it, suggesting that the Cause was: in the absence of TI, the BE90 pilot flew too close to the R22 which he may not

have seen. However, the radar recording suggests that the vertical separation might not have been quite so close as the R22 pilot estimated; the BE90 maintained 930ft (1014hPa) throughout, 280ft above the R22 pilot's reported passing altitude of 650ft (before he lowered the collective and descended). It was not possible to resolve whether the BE90 pilot had seen the R22 or not and whilst the Board accepted that the lack of TI was part of the Cause, some Members perceived this to be a conflict at the boundary of the ATZ. The ATSI advisor suggested the BE90 pilot was alert to all that was going on in the cct. However, as No 3 in the pattern, the BE90 pilot would have been monitoring the No 2 closely to judge his interval in the pattern; the No 2 was in the opposite LH cct for RW20, so the BE90 pilot would have been looking cross-cockpit to starboard to spot it and possibly concentrating on this ac. Therefore, without TI from the ADC it was entirely feasible that he had not spotted the R22 before he overflew it and then turned R onto base-leg. Weighing all these factors carefully, the Board concluded that this Airprox had resulted because, in the absence of TI, the BE90 pilot overtook the R22 causing its pilot concern. Moreover, in these circumstances the Members agreed unanimously, that the safety of the ac involved had been compromised.

Post Meeting Note: A report was eventually received from the BE90 pilot on 24 Jan 2012, too late to inform the Board's discussions. It did not provide any additional information relevant to the Airprox and made no reference to his sighting the R22 during this cct.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: In the absence of TI the BE90 pilot overtook the R22 causing its pilot concern.

Degree of Risk: B.