

AIRPROX REPORT No 2010163

Date/Time: 13 Oct 2010 1036Z

Position: 5750N 00313W (3nm
Final Approach RW23 at
Lossiemouth - elev 41ft)

Airspace: MATZ (Class: G)

Reporting Ac Reported Ac

Type: Tornado GR4 SAAB Gripen x2

Operator: HQ Air (Ops) Foreign Mil

Alt/FL: 900ft 800ft
QFE (1022mb) QFE (1022mb)

Weather: IMC IBCL VMC In rain

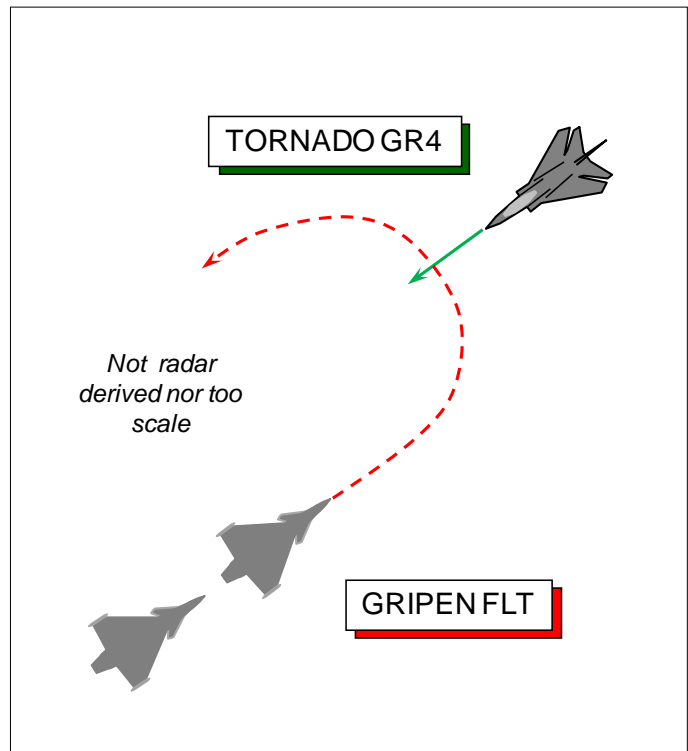
Visibility: 8km >10km

Reported Separation:

Nil V/200m H Not seen

Recorded Separation:

Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TORNADO GR4 PILOT reports flying an SRA at Lossiemouth having declared Fuel Priority (FP) and, he thought, under a 'radar control' service from Lossiemouth TALKDOWN under IFR. Although the recovery state was Radar to Visual, the weather conditions at base were poor with a cloud base of about 800ft.

Heading 224° at 200kt, they were descending wings level on the procedure through 900ft QFE (1000mb), in IMC, when they entered a break in the clouds about 4nm from the threshold of RW23. Simultaneously, both crew members saw a grey Gripen ac pass from L to R across their nose about 200m ahead at the same height in a banked turn away from them. As they descended below the cloud base the Gripen was seen on their starboard side maintaining height, in formation with a second Gripen that had not previously been seen by either crew member. Minimum horizontal separation was 200m, but as their Tornado descended the Gripen remained level, thereby resolving the confliction before avoiding action could be taken. They reported the close proximity of the Gripen ac to TALKDOWN and continued with the SRA, landing without further incident. At no stage were the positions of the Gripen ac passed to them by ATC. Their Ground Mapping Radar was being used to locate the RW threshold, so the Gripen was not detected before being sighted. He assessed the Risk as 'high'.

Their ac has a grey colour-scheme; the HISLs, anti collision beacons and landing lights were all on. The assigned squawk was selected with Mode C; TCAS is not fitted.

THE SAAB JAS39 GRIPEN PILOT, the wingman of the flight of two Gripen ac, reports they were on recovery to Lossiemouth after a local sortie and received the Weather State information as Colour Code WHITE [Vis >5km; Cloud SCT > 1500ft QFE] and that the recovery state was Radar to Visual.

When descending inbound they were visual with the water beneath at 1000ft QFE and were 'cleared' lower to get visual with the aerodrome. As they reached a height of about 800ft they called visual with the aerodrome and joined the cct at 200kt behind a 4-ship Gripen formation ahead. Whilst turning onto Final for RW23, under a BS, TOWER instructed the flight to 'go-around and climb to 1000ft'. The flight leader acknowledged the go-around, climbed and joined the new cct at 1000ft,

where they were flying in and out of cloud that made ac separation within the flight difficult so they joined a new cct at 800ft QFE in VMC for landing. They did not have enough fuel for an ILS/TALKDOWN after their go-around and therefore stayed visual with the aerodrome.

From their point of view, ATC should have known that a go-around and climb to cct height of 1000ft meant flying in IMC. It also appears that there was not enough spacing between the traffic inbound with TALKDOWN and the Gripen flight, as there were a total of 6 ac in the circuit. They did not see the Tornado GR4 flown by the reporting pilot.

His ac has a grey colour-scheme but the HISL was on. The assigned squawk was selected with Mode C 'on'.

THE LOSSIEMOUTH SRA CONTROLLER (TALKDOWN) was called to the ACR to carry out a SRA for the GR4 when traffic levels were quite high with a flurry of recoveries, mainly Radar to Visual from the N. Although the GR4 was FP and the crew's intentions were to land, the 2 formations of Gripens were vectored in to join the visual cct ahead of the GR4 as they were faster. The subject Gripen flight seemed to struggle to become visual with the aerodrome and he remembered looking at the Met cloud-base, which was given as SCT at 1200ft. He carried out the SRA for the GR4 and at the 4nm point was given a 'call by 2'. There were 2 primary contacts (SSR was selected off for the SRA) that looked like visual cct traffic, but as he was not given any TI on them he presumed they would not be a factor - either going around above the GR4, or extending behind it. At 3½nm from touchdown he realised the primary contacts were now crossing L - R against his GR4 SRA traffic. He called the contacts to the GR4 crew as, 'traffic was crossing now on the right possible visual circuit traffic', or words to that effect. The GR4 crew called visual so he continued the approach, obtaining and passing the final clearance – 'cleared to land, 4 on, 2 in' - at 2½nm from touchdown.

THE LOSSIEMOUTH AERODROME CONTROLLER (ADC) reports that a formation of 4 Gripens joined the visual cct at 1500ft QFE 1nm from the aerodrome due to cloud. Upon asking for descent to cct height they were instructed to do so, they then asked for 500ft. After it was established that this was necessary due to low cloud, further descent was approved on the Break. The subject flight of two Gripens then called to join and he gained visual contact as they were commencing their Break. At this time an 8 mile call was received from TALKDOWN for the GR4 to land - FP. The formation of four called Final gear-down individually and were given clearance to land with 'one on' and subsequently 'in turn'. The subject Gripen flight was instructed to go-around at cct height because radar traffic – the GR4 - was approaching 6miles, and given the position of the radar traffic. He thought, it was the flight leader [but actually the wingman] that then made a comment about climbing to 1500ft and it was eventually ascertained that the ac would be climbing to 1500ft and the wingman remaining at 1000ft as they had lost visual contact with each other [this is not reflected on the RT transcript]. The weather had deteriorated significantly at this stage, taking all of them by surprise. A 4 mile call was received for the GR4 to land and a 'call by 2' was issued. The formation of four landed and the GR4 was cleared to land '4 on - 2 in'. When visual contact was regained with the Gripen flight [after the Airprox] the GR4 was just overflying the RW23 ring road on short Final and the 2 Gripens appeared overhead. The Gripen flight then broke Downwind and upon receiving the Final gear down call was cleared to Land with one on and land in turn respectively. Once all ac were on the ground the SUPERVISOR (SUP) was informed that the visual cct had become unfit, the Duty Aircrew Officer (DAO) agreed and the visual cct was closed.

The Weather was reported to be 200/08kt; 15km in light drizzle; OVC cloud at 2200ft.

THE LOSSIEMOUTH ATC SUPERVISOR (SUP) reports that the Lossiemouth Weather State Colour Code was WHITE and on consultation with the DAO the recovery state was promulgated as Radar to Visual. There were multiple recoveries into both Lossiemouth & Kinloss with all control positions working extremely hard. The Gripen ac were on frequency, N of Lossiemouth, requesting a Radar to Visual approach. As with all foreign aircrew the APP controller was at maximum capacity ascertaining their exact requirements as well as vectoring the GR4 for an SRA - FP - to land. APP managed to vector the 6 Gripen ac so that they were visual with the aerodrome and switched them to

TOWER. He then received a call from the ADC to say that the Gripens had lost visual contact with the aerodrome and were carrying out a low-level cct to land. He told the ADC to inform the DAO that he was changing the recovery state to Mandatory GCA and that the visual cct was closed. The Gripen formation landed, but the flight of 2 was sent around to allow the FP GR4 to land.

HQ 1GP BM SM reports with RT transcripts that this Airprox occurred between a Tornado GR4 recovering to Lossiemouth via an SRA that had declared a fuel priority to land and a flight of 2 Gripen jets. The declared recovery state at the time was Radar to Visual. The Airprox occurred beneath recorded radar coverage.

At 1031:25, the ADC and APP were conversing on landline about a formation of 4 Gripen ac that was positioning for a Visual join ahead of the subject Gripen flight; APP advised, *"I'm going to keep these..Gripens coming"*, the ADC replying that the runway lights were required because, *"it's getting a bit scooshy out there."* This is believed to mean that the visibility [and/or cloudbase] was considered to be dropping.

At 1032:28 the first Gripen formation of four ac joined the visual cct at 1000ft. At 1032:53 they were still the only ac in the visual cct and reported they were unable to maintain 1000ft due to cloud, which they assessed as having a base of 600ft. On the tape transcript there is a live mic input when the ADC states, *"not fit they're looking for 500ft"*; however, it is not possible to determine who the ADC is speaking to [but possibly the DAO].

At 1033:18, the subject Gripen flight requested a join from the ADC, which was granted, with correct cct information being passed on the four Gripen ac downwind in the cct. At 1033:36, the subject Gripen flight reported on the Break for RW23 [LHC]. It is clear from the ADC's live mic retort *"where the...oh there they are"* that the Gripen flight could not initially be seen from the Control Tower and another indication of the degradation of conditions in the visual cct. At 1034:07, the first formation of four Gripen ac was given clearance to land 'in turn'.

At 1034:34, TALKDOWN made an on channel intercom broadcast to alert TOWER to the GR4 passing 8nm from touchdown that was to land *"fuel priority"*. The ADC said to an unknown individual on a live mic at 1034:50, *"not just now...give it 10 minutes Tornado is not gonna get in fuel priority with 6 aircraft landing."* Given that the GR4 crew had declared fuel priority, the ADC correctly accorded them priority ahead of the subject Gripen flight, instructing the Gripen flight leader at 1035:15 to, *"..go around circuit height 1 thousand feet"* that was followed by the same instruction to his wingman both of which were read back. At 1035:23, a transmission was made by the ADC to the Gripen flight leader and wingman that radar traffic, the GR4, was now passing 6nm. At 1035:29, another comment from the ADC on the open mic was captured that highlights the pressure that the controller was under, saying, *"right how many we got on the ground? Is that the third or fourth aircraft?"* This is believed to be the ADC trying to ascertain how many of the first Gripen formation had now touched down. The intercom broadcast from TALKDOWN to the ADC *"4 miles 1 thousand feet [C/S] land fuel priority"* was made at 1035:55, seeking the GR4's clearance to land. However, due to the uncertainty of the traffic situation the ADC responded, *"..call by two"*, delaying the decision on the final clearance.

At 1036:05, the transcript reveals the ADC asked, *"where's [Gripen flight lead C/S]"*. At this point the weather conditions meant that the ADC was unable to see where the cct traffic was. However, he should have still been able to utilise the Highbrite ATM to facilitate the integration of the Gripen flight and the inbound IFR GR4. Indeed, the fact that the ADC updated the position of the GR4 at 6nm to the Gripen flight indicates that he was utilising the ATM, but this Command has been unable to establish whether the ADC was able to see the Gripen flight on the Highbrite display. At this point (1036:20) the Gripen flight wingman reported *"I-M-C climbing to 1 thousand 5 hundred feet"*. However, the ADC responded to the Gripen flight giving both ac permission to descend, *"roger you may descend to 5 hundred feet for cloud"*, as the first Gripen formation had previously done so, to maintain VMC. This transmission was not acknowledged by either pilot, nor was the formation's intentions questioned by the ADC. Whilst it is impossible to determine whether the Gripen wingman

climbed to 1500ft QFE, what is clear is that both ac of the flight turned across the approach lane and at least one of them was at or about 1000ft QFE.

[UKAB Note (2): The TALKDOWN transcript reflects that at 1036:13 the GR4 is *“on centreline 3 miles 7 hundred and 50 feet approaching minimum descent point”*. (The RW23 SRA Missed Approach Point is at 1nm and the MDH 500ft.) The next transmission was at 1036:23, *“on centreline contact...on your right hand side ??? [inaudible word] traffic..2 and a half miles”*.]

Based upon the reported events, the CPA occurred when the GR4 was approaching 3nm from touchdown, with the GR4 crew gaining visual contact with both Gripens at about 2½nm from touchdown as they broke through the cloud-base.

It was a reasonable assumption for the TALKDOWN controller to report that the two primary radar contacts that had been seen were visual cct traffic. However, when he perceived that the Gripen flight posed a threat to the GR4, the TI passed to the crew was not in a useable format for them to assimilate. This would explain the GR4 pilot's statement that 'at no stage were the positions of the Gripen aircraft passed'. Furthermore, the console layout in the ACR meant that the SRA controller was on the far RHD side of the room, but unable to improve his SA by viewing the PAR or DIR's display and would have been reliant on the Supervisor [or ADC] for information on the Gripen flight.

At 1036:29, a 2½nm call was made by TALKDOWN and a clearance followed from the ADC immediately, *“clear to land four on, two in”*. The associated broadcast on the TOWER frequency was made by the ADC to visual cct traffic at 1036:36, *“Tornado 4 miles [sic] 2 miles land”* that was followed by an inaudible transmission. It is possible that the ADC was uncomfortable with the situation as at 1036:43, he immediately instructed the Gripen flight leader to *“report finals, gear down radar traffic now at 2 miles to land”* with a further warning about the GR4. At 1036:48, the Gripen flight leader stated that they were *“over threshold, 1 thousand feet VMC, now will..go around for another approach.”* However, based upon the GR4 pilot's report, it appears that this was after the CPA with the Gripen flight almost certainly when they were Deadside and tallies with the point where the GR4 gained visual contact.

It appears that the ADC was unable to assimilate the impact of the deteriorating weather on the Gripen flight's ability to execute the Go-around safely, believing that the instruction to Go-around 'made' the situation safe. Furthermore, this last transmission by the Gripen pilot indicates that they had again crossed through the approach lane for the airfield without communicating their intention to do so.

This Airprox is the epitome of a Swiss cheese barrier erosion. Supervision of the situation by both the SUP and the DAO was not robust enough to take into account the decreasing weather conditions. This meant that ac in the visual cct were unable to gain visual contact with the GR4 on instrument approach. Furthermore, the unsuitable weather conditions made it impossible for the ADC to manage the cct by visual scan alone and provide relevant information in order for the cct traffic to take appropriate action to sequence themselves against IFR traffic. That said, whilst there is evidence that information was derived from the Highbrite ATM display, its full potential was not exploited to aid integration calling into question whether the Gripens 'painted' on the Highbrite. Finally, the Gripen pilots although aware of the inbound radar traffic, appear to have turned across the approach lane without first ensuring that they were visual with the radar traffic, thereby removing the final barrier to the occurrence.

When the ADC stated *“it's not fit”* after the four-ship Gripen formation leader reported needing to get below the cloud at 600ft, the ADC had an opportunity to send the subject Gripen flight back to radar. However, it is not clear whether the ADC considered this or whether it had been discounted. The SUP was in a position to realise the potential for difficulties and insist that the Gripen flight was instructed to depart the cct and return to APP. The SUP was aware that the GR4 was fuel priority and that this would shape the way that the ADC planned the integration of the visual cct with instrument traffic. Nevertheless, it is clear from the reports and RT tape transcripts that the ATC

team were under considerable pressure to attempt to recover all of the ac as expeditiously as possible, in rapidly deteriorating weather conditions.

HQ 1Gp BM SM Spt recommends that the Unit review:

- a. The safety implications of vis cct conditions and procedures for dispersing the visual cct if weather conditions are not deemed suitable.
- b. The briefing of visiting aircrew.

UKAB Note (4): The UK MIL AIP at AD2 EGQS AD2.21 Noise Abatement procedures notes:

1. a. RW23. Visual circuit is flown outside Lossiemouth town. If it is necessary for the aircraft to go around this should be done from the end of the downwind leg provided that visual contact has been established with any aircraft carrying out instrument approaches.

UKAB Note (5): Met office archive data gives the Lossiemouth METARS as:

0950Z 25008KT 9999 FEW015 OVC022 10/08 Q1022 WHT NOSIG
1050Z 30010KT 9999-DZ SCT010 OVC022 10/09 Q1023 GRN TEMPO FEW010 BKN020 WHT

Another source gives the following special:

1016Z 28008KT 9999-DZ SCT012 OVC022 10/08 Q1023 GRN TEMPO FEW012 BKN022 WHT=

HQ AIR (OPS) concurs with HQ 1 Gp BM SM in that supervision of the situation by both the SUP and the DAO was not robust enough to take into account the decreasing weather conditions. It is disappointing that the information regarding the actual cloud base (<1000ft) was available to the ADC at 1032 that he then, at 1035, directed a formation to go around at 1000ft thereby guaranteeing that they would be unable to visually separate from the fuel priority radar traffic. Additionally, if recovering flights are caught out by unexpected deteriorations in weather and do not have the endurance to reposition for an instrument approach they should be directed to divert.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, transcripts of the relevant RT frequencies, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

HQ 1Gp BM SM had likened the circumstances surrounding this Airprox to one of a 'Swiss cheese barrier erosion', where all the holes had aligned thereby allowing the Airprox to develop unchecked. Although the outcome was not engineered, fortuitously the end result was not catastrophic. There were many facets to this Airprox, which the Board debated extensively. However, the absence of a radar recording illustrating the geometry and the timings of what actually occurred had hampered full understanding of all that transpired. The key factors considered by the Board were as follows:

- ATC were working hard to facilitate Radar-Visual recoveries in marginal weather. The ADC was extremely busy after the Gripen flight arrived in the visual cct area, with 6 ac either in or joining the cct, all having difficulty maintaining VMC and being forced below normal cct height, with the added complication of the GR4's IFR arrival.
- This rapid and unexpected deterioration in the weather, not apparently forecast, could have been acted upon earlier by any one of the supervisory team in the tower to forestall the outcome. About 2 min before the flight called to join, the ADC and APP had realised the visibility was dropping. This was an opportunity to discuss the situation with the SUP and DAO, either of whom could have initiated IFR recoveries. It seems likely that such a change would have resulted in some of the ac having to divert, and it is possible that this consequence was a factor in the controllers' and supervisors' minds. In the event, it appeared that the ADC did not appreciate just how poor the conditions had become until the

4-ship of Gripens requested to fly at 500ft in the cct to remain visual. Having realised that the cct was “unfit”, there was an opportunity to initiate IFR recoveries, and to divert the subject Gripen flight at that point if they had declared that they had insufficient fuel for a PAR recovery at Lossiemouth. However, with just 30 secs between the ADC’s agreement to 500ft ccts for the 4-ship and the pair’s break into the cct, it was a fleeting opportunity.

- The RN Member voiced concern at the absence of any dedicated ATC supervisor in the VCR. Recognising that the radar supervisor’s rightful place was overseeing the watch within the ACR, at RN Air Stations a Duty Air Traffic Control Officer is established to supervise the control of aerodrome traffic, monitor the weather and manage the operation of the aerodrome in close consultation with the officer-in-charge of flying and the ATC Supervisor.
- When the Gripen flight joined, the ADC was having difficulty keeping track of them visually. Subsequently, when TALKDOWN advised of the FP GR4 at 8nm to Land, the ADC elected to initiate the go-around, crucially instructing the Gripen flight to fly at the nominal cct height of 1000ft thereby instructing them to fly in cloud. Given the difficulties experienced in the cct by the 4-ship formation earlier, the ADC should have realised that this was unwise; this was the precursor to the flight split and the wingman climbing to 1500ft.
- The HQ Air Ops fast-jet Member noted that other crews might have refused, or at least queried this instruction, and elected to cct at a lower height.
- From the pilots’ reports and METARs the in-flight visibility beneath cloud remained entirely satisfactory; it would have been preferable to have held the Gripen flight ‘VMC below’ on a low-level cct, making greater use of the Highbrite ATM and passing copious TI, until they had either sighted the GR4 after it broke cloud or it had been seen to pass abeam, sending them back to radar on a long downwind to do so if necessary.
- ADC advised the Gripen flight that the GR4 was at 6nm, before they crossed through the approach ahead of it, but it seems the Gripen flight pilots either did not assimilate the information, were concentrating on maintaining their separation from each other while IMC, or perceived that the height specified of 1000ft would facilitate separation against the GR4 when they crossed the RW centreline into the deadside.
- As it was, the No2 Gripen pilot did well to find his leader once more after his ascent to 1500ft, but this seemed to happen as the GR4 broke through cloud just as the Airprox occurred.
- The GR4 pilot had little impact on the outcome; when advised of the traffic by TALKDOWN he could do no more than search for it visually and remain predictable by maintaining his course and ROD.
- TALKDOWN, who was providing a TS, was denied accurate height information from the Gripens’ Mode C by operating with SSR suppressed, hence he was unable to include that crucial element within his TI, which was not transmitted clearly. It was unfortunate that the SRA console was displaced away from the PAR which would also have provided accurate height information on the Gripen flight.
- None of this was visible to the ADC from the Control Tower except on the ATM. The GR4 was not seen by the Gripen pilots before one of them crossed ahead belly up to the GR4, 200m ahead at the closest point the GR4 pilot reports. Considering all of the factors, the Board concluded unanimously that earlier intervention could have forestalled the Airprox and that the root Cause was that visual circuits were permitted in unsuitable weather conditions.
- What separation that existed was purely fortuitous; the Members agreed unanimously that an actual Risk of collision had existed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Visual circuits were permitted in unsuitable weather conditions.

Degree of Risk: A.