PART 1.6 – CONVENING AUTHORITY COMMENTS

1.6.1 This Service Inquiry (SI) has taken a considerable time to complete but has been painstakingly thorough and contains a wealth of recommendations and information that will be invaluable to all military aviation operators, not just within the Tornado Force. The SI Panel should be commended for the successful completion of a difficult task which involved, amongst other things, a demanding maritime salvage operation and no eye-witnesses able to offer any substantial evidence. I support the majority of the findings and the recommendations in full but will limit my comments to what I believe to be the most significant issues. The tragedy is that we have lost three highly professional, dedicated and capable aircrew and my sympathy goes to their families, friends and colleagues. As I am sure our lost crews would support, our job now is to use what we know of their final moments and the circumstances surrounding their flights to help prevent any further Mid-air collisions. The SI Panel rightly identified the cause of the accident to be a "lack of recognition of converging flight paths which resulted in both aircraft being in the same airspace at the same time". Although factually correct, I believe it somewhat simplifies the headline issue and, whilst not disagreeing with their statement, I would add that a lack of situational awareness of each others' sortie, from the planning phase right through to the actual collision, was highly significant. Tragically, there were many opportunities to enable de-confliction but, for a number of reasons, including chance, this did not happen. As with many accidents, bad luck has to be part of the explanation, particularly in the closing stages when they were belly up to each other; a few feet difference in altitude of one of the aircraft would have created a near miss rather than this tragic accident. Unfortunately, the final safety barrier which would have generated awareness of their close proximity did not exist as the Tornado GR4 is not fitted with a Collision Warning System (CWS).

1.6.2 At the time of the accident, the Squadron was conducting split site operations[1] which appear to have been well considered and planned by the XV(R) Squadron flying executive, including a restricted flying rate, but inevitably this left the Squadron taut for supervision. There is little doubt that: fatigue management of the long days; multiple met briefs; secondary duties; Duty Authoriser handovers; ABBOT 2 rear-seat pilot being unaware he was flying until a short time before sortie planning commenced; oversight of the planning activity; missed opportunities at the sortie out-brief; lack of de-confliction; and other factors played a part in the aggregation of a situation that prevented crews and supervisors from breaking the chain of events leading to the accident. There is much to learn for all of our squadrons from the supervisory, authorisation and planning activities relating to this accident; however, by necessity our squadrons operate in different ways and we should guard against a one size fits all approach to these observations –

[1] Half the squadron were on a detachment to Cyprus.

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they will no doubt be useful to some and Duty Holders are commended to note the recommendations accordingly. Additionally, there were a number of disappointing currency issues identified within the report, none of which had any bearing on the accident but should serve as a reminder to squadron commanders to do their housekeeping. There is clearly much that we can learn at every level and it is important to highlight that these lessons should not be seen as individual failings as when seen as a whole this was a busy squadron which was highly competent and qualified, going about its business in a professional manner against a background of a significant task and taut resource.

1.6.3 The SI Panel rightly considered the flying anxiety medical condition of ASTON 1 Weapon Systems Operator (WSO) which was particularly related to flight at medium-level. The WSO had presented to medical staff with anxiety related issues which included physical symptoms of vertigo, dizziness, fear of falling, abdominal pain and others, which are clearly not compatible with operating the rear cockpit of a Tornado. Nonetheless, following presentation, he returned to duty after a period of 2 weeks off flying but only flew at low altitude (and crewed with other staff) for some period of time. Essentially, the WSO was managing his own condition between the various medical staffs and the flying executive and was being relied upon to self-assess as to whether his symptoms posed a safety hazard. The day before the accident, ASTON 1 WSO asked the instructor detailing the flight to "try and keep it at low level," most likely due to his medical condition and concern over medium-level flight. On the majority of UK sorties, there is always the chance of having to climb to medium-level for airmanship or safety reasons and allowing a crewmember exposure to this risk which might result in serious physical symptoms related to flying anxiety is unwise. The SI Panel elected to consult the Civil Aviation Authority (CAA) Chief Medical Examiner to provide a comparator to this case and she concluded unequivocally that the CAA would not allow aircrew with such symptoms to continue flying in parallel with any assessment and treatment. Whilst the WSO had been open with regard to his flying anxiety, there was no holistic Care Plan that included medical staff, the flying executive, the patient and the treatment which would have provided proper oversight and supervision. The inadequate handling of his condition has similarities with the 2009 Grob Tutor/Cirrus Glider fatal Mid-air collision where the Board of Inquiry commented that the "management of the pilot's medical condition and supervision of his suitability to carry out his duties was not robust". Ironically, this case (Tutor/Cirrus) is used as a case study during Aviation Medicine training courses to highlight the critical flow of information between the medical staffs and flying executive. It is disappointing that, in this case, lessons appear not to have been learnt from the 2009 Tutor/Cirrus accident and once again we find ourselves with a crewmember involved in an accident whose fitness to fly was questionable but continued to do so due to gaps in the interrelationship between medical and flying executive staffs.

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1.6.4 The SI Panel went to great lengths to determine whether or not ASTON 1 WSO's medical condition contributed to the accident by his haste to get back down to low level, following a weather abort to medium-level just prior to entering Tain Air Weapons Range and in the end they could not rule out that possibility. However, after much detailed analysis of the available data including the cockpit voice recorder, I do not believe, on the balance of probabilities, that ASTON 1 WSO's medical condition had any known, or at least any significant, impact on the eventual outcome of the Mid-air collision. Indeed, whilst ASTON 1's descent to low altitude was rushed and in conditions of marginal weather, this course of action was in line with the sortie objectives and there is no evidence that his anxiety played a part in his decision making. However, his airmanship decisions to continue flight in an Advisory Airway without a radar service (against local orders) and his descent into the Moray basin in marginal weather, again without a radar service, were not commensurate with his recognised experience and professional standing. The manner in which this descent was conducted contributed to ASTON 1's and ABBOT 2's lack of situational awareness as it prevented either aircraft or Lossiemouth ATC from gaining traffic information which could have potentially been used by either party for de-confliction. I agree with the Panel's conclusion that this was a contributory factor since although it did not directly cause the accident it did make it more likely.

1.6.5 Mid-air collisions have been a regular feature of military flying over many years and the SI Panel spent much effort investigating the Mid-air collision risk and the procurement record of the Tornado CWS. Between 1979 and 2001 there were 42 separate Mid-air collision events involving RAF aircraft in which 47 aircraft were totally destroyed, including 12 Tornado GR1/4s, which resulted in 40 lives being lost and a considerable cost to Defence. Since 2001 there have been a further 9 Mid-air collisions involving UK military aircraft which has resulted in 17 further deaths, including three air cadets. It is noteworthy that all 5 of the aviation Operating Duty Holders have Mid-air collision in their top level risks with 4 of them holding it as their number one risk. The Tornado GR1/4 CWS procurement has its roots back in the 1998 Strategic Defence Review (SDR) and has suffered from numerous delays, cancellations and deferments without a coherent audit trail ,which made it difficult for the SI Panel to gain a complete picture of decision making. However, we know that, following numerous accidents, the 1998 SDR instigated the development of a CWS for the Tornado GR1/4 to be fitted by "early next century". Over the next 14 years, the programme was subject to five deferrals, re-programming prioritisation, deletion in 2010 and eventual resurrection in 2012, on direction from the Secretary of State following elevation of the Tornado Mid-air collision risk by the Duty Holder community. It should be noted that, as of November 2013, Tornado Mid-air collision risk is the only aviation risk across Defence that has been elevated to the Senior Duty Holder (Chief of the Air Staff in this case) and the Secretary of State in accordance with the post Haddon-Cave operating model and demonstrates the

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seriousness with which the issue has been taken over the last 2 years. Overall, the most realistic and technically achievable first In-Service Date was 2010 and CWS should therefore have been fitted at the time of this Tornado accident. However, it is assessed that financially driven decisions made by the MOD as far back as 2005 and sometimes based on an inaccuracy or highly abbreviated impact statements, including a lack of safety consideration, resulted in no CWS being fitted at the time of the accident. Looking back over these years, Tornado CWS procurement makes uncomfortable reading; however, we must be careful not to judge historic safety related decisions on the standards that we expect today in the post Haddon-Cave world of safety improvements, better risk management and enhanced safety culture. The Nimrod Review made fundamental changes to the way in which we conduct our business but this would not have been institutionalised or embedded until the Military Aviation Authority reached operating maturity around April 2011. It would also be easy to focus on the lack of a CWS as the cause of this accident but CWS was just one important mitigation in the prevention of a Mid-air collision. Much work has been done over many years to help mitigate this risk[2] and this continues today with the Duty Holders. I acknowledge the work undertaken by the SI Panel in coming to their conclusions with regard to the risk management process operated by RAF HQ Number 1 Group at the time of the accident, and understand their logic. However, I am not persuaded that HQ Number 1 Group's risk management process did not reduce the risk of Mid-air collision to a position of As Low As Reasonably Practicable (ALARP), bearing in mind the activity taken over the years to reduce the Mid-air collision risk and the significant work predating the accident in HQ 1 Group (and Air Command) into this risk, including that generated by the Senior Duty Holder following a spike in Air Proximity (near-miss) reporting. Moreover, a fully funded programme for the fitment of CWS to Tornado existed and was being pursued by the DE&S with full haste and thus satisfying the 'R' for Reasonable in the ALARP mnemonic. Above all, we must now learn from this accident and make sure that a comprehensive plan exists for the fitment of CWS on our legacy and future military aircraft fleets to include the Typhoon and F-35B, neither of which currently has a requirement or programme.

1.6.6 There are a number of other important issues captured by the SI Panel, of which two are procurement related or at least part-procurement related and deserve mention. In the late 1980s the requirement was identified for an electronic planning and de-confliction aid but so far this has not yet been delivered to our flying community. Indeed, some major projects[3] running literally over years have not delivered conflict alert functionality to our operators. It cannot be acceptable

[2] Improved conspicuity (electronic, visual, lighting and paint schemes), mandated route flows and use of Air Traffic Control services, engagement with civilian agencies, etc.

[3] Automated Low Flying Enquiry and Notification System (ALFENS), Messaging (M)-ALFENS, Military Flying Management Information System (MFMIS), Centralised Aviation Data Service (CADS) and Defence Aviation Collision Avoidance Service (DACAS).

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for our crews in 2013 to be faxing hand drawn route traces as a means to enable some form of de-confliction across flying Wings. The inability to procure an electronic planning/de-confliction aid is assessed as a contributory factor in this accident and I wholeheartedly support this assessment. The second and most worrying issue is that the surviving pilot of ABBOT 2 suffered [redacted] on ejection and was found clinging semi-conscious to his liferaft. This accident happened in daylight and in the middle of the summer with a sea temperature of 12 degrees and just 15 miles north of a SAR helicopter base who were airborne within minutes. When he was rescued, the pilot had been in the water for 75 minutes [redacted]. In the year 2000, the UK received notice that the COSPAS-SARSAT operating on 121.5/243 MHz would be withdrawn in 2009 and changed to a satellite operating on a different frequency (406 MHz). The failed procurement of a replacement emergency locator beacon means that fast-jet aircrew do not currently have a credible automatic locater beacon that can provide immediate satellite geo-location. The earliest forecast of when the new beacon will be in service is early 2015, with the gap being mitigated by the Duty Holders using a variety of interim beacons which require extraction from a waistcoat pocket and manual operation – something that ABBOT 2 Rear Seat pilot could not complete due to injury.

1.6.7 In summary, this tragic accident was caused when four highly competent and professional aircrew ended up unaware of their proximity to each others' aircraft in a busy, fast moving situation compounded by poor weather. There was much opportunity for this Mid-air collision to be prevented by de-confliction, supervision and lookout but for a variety of reasons this did not happen and a significant safeguard of a CWS did not exist. The medical aspects of the ASTON 1 WSO are disappointing but, although the Panel were unable to rule it out, on the balance of probabilities, I do not believe his medical condition had any material bearing on the outcome of this accident. Mid-air collision remains the top aviation operating risk across Defence. This is not new and much mitigation has been introduced over the years to include the fitment of CWS on many platforms. It should be noted that a CWS is only one of many mitigations and would not necessarily prevent collisions in all cases, particularly those that are highly dynamic and at very low level. The fast-jet community has operated in the compressed airspace environment below 2,000 feet for many years and form the bulk of the Mid-air collisions and resulting deaths. It is regrettable that the fitment of the CWS on the Tornado has taken such a difficult and prolonged path and perhaps reflects the lack of priority placed on safety enhancements prior to the Haddon-Cave Review; however, we should be careful not to judge yesterday's decisions on today's standards. The elevation of the Tornado CWS programme to the Secretary of State in 2011 and subsequent funding of the programme shows a change in the handling of our safety enhancements, clear ownership and management of risk. The MOD must be able to flag its safety enhancements but there must also be no right of passage and they should be subject to the same

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intense scrutiny as other programmes. Where the cost verses benefit argument does not hold then tough decisions will need to be made and the risk held and mitigated at the right level. I anticipate that decisions will soon need to be made with regard to the requirement to fit CWS on the Typhoon and the F-35B, neither of which yet have a requirement or programme; not fitting a CWS to these aircraft is, in my view, an unsustainable position. Flying in the military environment inevitably presents risks that can materialise at any time. Tragically, for a number of reasons, including a degree of bad luck, the risk of Tornado Mid-air collision was realised on 3 July 2012 with three families losing their loved ones and the RAF losing three of its talented aircrew colleagues. It will provide little consolation to many but I hope this SI Report can now be used to draw lessons that will help prevent a further occurrence.

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