



Ministry
of Defence

Ministry of Defence
Main Building
Whitehall
London SW1A 2HB
United Kingdom

Ref: FOI2017/13752
FOI2017/13418

E-mail: DSA-Enquiries@mod.gov.uk

5 April 2018

Dear [REDACTED]

Thank you for your emails of 19 and 21 December requesting the following information:

"Under the Freedom of Information Act 2000 please release any correspondence dating from the last six months between the CAA and the MAA, setting out recommendations in respect of civil registered aircraft using military aerodromes."

and

"further to the release by the Defence Safety Authority of FOI 2017/12678 please release:

- 1. The CAA's review into the use of RAF Northolt as alluded to in the first paragraph of the letter dated 14 September 2017, from Mark Swan to Rear Admiral Paul Chivers OBE.*
- 2. Please release the full minutes of the Government Aerodromes Coordination Group from October 2017.*
- 3. The formal response of the Military Aviation Authority to the aforementioned review by the CAA.*
- 4. Further correspondence in response to the letter of 14 September 2017 (as disclosed in FOI 2017/12678) between the Military Aviation Authority, Department for Transport, Ministry of Defence and CAA."*

I am treating your correspondence as a request for information under the Freedom of Information Act 2000 (FOIA). For ease of reference I am consolidating your requests and our response.

A search for the information has now been completed within the Ministry of Defence, and I can confirm that some information in scope of your request is held.

The information you have requested can be found enclosed but some of the information falls entirely within the scope of the absolute exemption provided for at sections 40 (Personal Data) of the FOIA and has been redacted.

Section 40(2) has been applied to some of the information in order to protect personal information as governed by the Data Protection Act 1998. Section 40 is an absolute exemption and there is therefore no requirement to consider the public interest in making a decision to withhold the information.

Under Section 16 of the Act (Advice and Assistance) you may find it helpful to note that there is no information held in respect of item 4 of your request dated 21 December regarding Department for Transport.

If you are not satisfied with this response or you wish to complain about any aspect of the handling of your request, then you should contact us in the first instance at the address above. If informal resolution is not possible and you are still dissatisfied then you may apply for an independent internal review by contacting the Information Rights Compliance team, Ground Floor, MOD Main Building, Whitehall, SW1A 2HB (e-mail CIO-FOI-IR@mod.uk). Please note that any request for an internal review must be made within 40 working days of the date on which the attempt to reach informal resolution has come to an end.

If you remain dissatisfied following an internal review, you may take your complaint to the Information Commissioner under the provisions of Section 50 of the Freedom of Information Act. Please note that the Information Commissioner will not normally investigate your case until the MOD internal review process has been completed. Further details of the role and powers of the information Commissioner can be found on the Commissioner's website, <http://www.ico.org.uk>.

Yours sincerely,

DSA Secretariat

CAA/MAA GACG 'LIST OF EMERGING ACTIONS'

Action No	Subect/Action	Action	Action Owner	Response	Deadline	Open/Closed
1	Northolt: Final MAA Report –	Final report to be shared with CAA	[REDACTED]	Distributed		Closed
2	Signed MoU:	IB advised that she could not get access to the signed MoU. SB to forward her copy to IB.	[REDACTED]	[REDACTED] has now forwarded the signed copy to [REDACTED]	-	Closed
3	MoU Annex A Tranche 1/Tranche 2/Out of Scope	Annex A (list of aerodromes accepting civil operations) is divided into 'Tranche 1 and Tranche 2', although the criteria for each tranche is unclear. IB to develop a draft 'matrix' of items (ie approach service, percentage of civil operations, runway coding etc) to be included and send round to the GACG members for comment.	[REDACTED] All		31/10/2017	Open
4	Military/Civil AIP	A policy decision needs to be taken around whether Govt aerodromes are included in the Civil AIP or whether the Mil AIP is made available to all civil operators.	[REDACTED]		tbc	Open
5	Civil aerodromes accepting military operations	The CAA and MAA should establish a process to feed back MORs/intelligence on military operations at civil sites (ie Cambridge, Warton) and civil operations at military sites.	[REDACTED]		tbc	Open
6	MoU baseline information	The GACG members need to decide the key 'triggers' for an MOR analysis (ie runway incursions all aircraft/vehicles, controller issues, bird/wildlife strikes)	[REDACTED] /All	All comments back to [REDACTED]	Open	Open

Action No	Subect/Action	Action	Action Owner	Response	Deadline	Open/Closed
7	Defence Aerodrome Manuals (DAMs)	These should be made more readily available to civil operations			Tbc	Open
8	Records of Decisions (RoDs)	Put the RoDs in a more readily available format and distribute to members of GACG			31/10/2017	Open
9	MAA Representative	With [REDACTED] leaving the MAA, there is a need to identify a replacement as a matter of priority			31/12/2017	Open
10	RAF Wittering	During the meeting, both teams (CAA/MAA) raised their concerns around RAF Wittering. [REDACTED] to decide how to respond to these concerns and feed back at next meeting (before end of 2017)			31/12/2017	Open
11	GACG Meetings	Put the meetings in a calendar for the 2017/2018 period (minimum 4 per year with attendance from specialists in each domain)				



Rear Admiral P A Chivers OBE
Director MAA

Military Aviation Authority
Juniper 0 #5003,
MOD Abbey Wood (North),
Bristol BS34 8QW

Military Network: [REDACTED]
Telephone: [REDACTED]
Email: [REDACTED]
www.gov.uk/maa

Mark Swan
Group Director
Safety and Airspace Regulation
Civil Aviation Authority

20171002-DMAA_CAA
Response-O

3 Oct 17

Dear Mark,

RESPONSE TO RAF NORTHOLT LETTER

Thank you for your letter dated 14 Sep 17 and a copy of the Review into the CAA's oversight of the Civil Commercial Air Transport use of RAF Northolt. Please be assured that you have my support in taking forward some of the issues you raise. I will be meeting with both ACAS, Air Vice Marshal Mike Wigston and Director Cyber Intelligence and Information Integration (DC I3), Major General James Hockenhuil this month in order to gain better clarity on progress with the historic reviews you mention on ATM civil equivalence and the accuracy and accessibility of Aeronautical Information (notably in the context of CAT operating at government aerodromes).

Please be assured that we are fully cognisant of the MOD's responsibility to ensure that Military ATM provision offers a level of safety that is at least as effective as that required by the essential requirements of the EASA Basic Regulation. I know that my Regulations team are already working towards enhancing the output of the Government Aerodromes Coordination Group (GACG) and MOD governance work relating to ADQ-IR compliance and the Military AIP. Likewise, my Analysis and Plans team are working towards providing a response to your recent review of RAF Northolt, noting your suggested timelines.

I look forward to meeting with you on 11 Oct 17 to talk through these issues further.

Yours Aye





Rear Admiral P A Chivers OBE
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20171103_DMAA_CAA_Northolt
Review

1 Nov 17

Dear Mark,

CIVIL COMMERCIAL AIR TRANSPORT (CAT) USE OF RAF NORTHOLT - REVIEW

1. Thank you for providing me with the opportunity to comment on the review into the CAAs oversight of the Civil CAT use of RAF Northolt. You will be aware that receipt of the review has generated considerable levels of productive activity both within the MAA and through engagement with MoD stakeholders, much of which is reflected in the discrete responses to each of the recommendations included at Annex A.
2. The first of the two key findings of the review assessed that hitherto "*only limited assurance could be gained from the workings of the Government Aerodromes Coordination Group (GACG)...*" Whilst I accept that this might historically have been the case, I remain convinced that the group has much to offer as the conduit for assurance activity. With renewed strategic direction and the ongoing implementation of a number of recommendations from the review, I received very encouraging feedback from the most recent meeting on 4 Oct 17, and am keen that we continue to develop this forum; I see a fully mature GACG as the primary method by which the CAA and MAA share information regarding CAT use of Government Aerodromes.
3. The quality and availability of information provided to CAT users of RAF Northolt, highlighted as the second key finding of the review, has been the catalyst for a series of engagements and a broader review of the MOD governance of Defence Aeronautical Information Services. It is intended to review and if necessary reinforce existing regulation and oversight of Aeronautical Data distributed by the MoD, thereby enabling a robust mechanism by which the MAA can provide appropriate assurance to the CAA.
4. You would also wish to be aware that No1 AIDU will imminently be releasing a new policy for accessibility of the Mil AIP which will see the document reverting to on-line only distribution available to existing, pre-registered civilian users free of charge. It is an aspiration that this arrangement be extended across the aviation community, possibly without the requirement for pre-

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registration. Such a significant potential change to the availability of the Mil AIP, adds a new dimension to the debate about the future source of Government Aerodrome information, and I invite the GACG to revisit the subject in light of this important development.

Yours Aye



Annex:

- A. MAA response to CAA Review recommendations – Civil CAT use of RAF Northolt.

**MAA RESPONSE TO CAA REVIEW RECOMMENDATIONS - CIVIL CAT USE OF RAF
NORTHOLT**

Recommendation 2017/01: The CAA involvement with the GACG should be bolstered to include ATM, FOPS and International Strategy and Engagement (ISE) of the International Directorate (ID). This may take the form of actual attendance or a pre-meet where risks can be discussed. Consideration should be given to the need for DfT involvement.

MAA response **Accepted**

MAA comment: The MAA agrees that greater effect would be achieved through broader stakeholder engagement. At the recent meeting, an Action Matrix was proposed and review of attendees and potential pre-meet structures will be taken forward.

Recommendation 2017/02: The MAA should be asked to ensure that suitably qualified and informed representation be provided at the GACG. (This might mean representation from the front line commands). This may take the form of actual attendance or a pre-meet where risks can be discussed.

MAA response **Accepted**

MAA comment: The MAA will review the level of representation at the GACG and consider the requirement for MoD pre-meet to ensure suitably empowered, SQEP representation at the GACG.

Recommendation 2017/03: The GACG MoU be reviewed to determine its appropriate scope over and above just ICAO Annex 14.

MAA response **Accepted**

MAA comment: The GACG MoU is subject to annual review, but the MAA accepts the potential benefit of conducting an extraordinary review.

Recommendation 2017/4: A formal CAA internal process should be established to ensure that any information, including occurrence reports is shared amongst other SARG teams and a formal record made of any decision or conclusion made after validation of that information.

MAA response **Accepted**

MAA comment: Accepted as CAA internal business which might inform GACG business.

Recommendation 2017/5: An individual within the CAA should be nominated as accountable for the processing and validation of information received from the MAA/MoD.

MAA response **Accepted**

MAA comment: Establishment of an initial single point of contact within the CAA considered mutually beneficial in streamlining engagement.

Recommendation 2017/06: The MoD and DfT should determine if all Government Aerodromes should be included or removed from the civil AIP.

MAA response **Accepted**

MAA comment: It is agreed that the issue of source documentation for publication of Government Aerodromes' data (Mil or Civ AIP, or both) should be determined. The MAA has begun engagement

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with senior MoD stakeholders (ACAS, DC I3, AIDU) to ensure robust regulation for the governance of Defence AIS. A revised policy on the accessibility of the Mil AIP has been drafted and release is expected imminently; subject to registration and acceptance of T&Cs, this will provide free access to the Mil AIP for all existing pre-registered customers, with potential to extend to all members of the civil aviation community. In light of this significant change to the context of Mil AIP accessibility, the GACG should review the subject and make a recommendation about the requirement for Government Aerodrome inclusion in the Civ AIP.

Recommendation 2017/07: A review should be made of the RAF Northolt AIP entry and edits made to ensure it matches the standard required of other Licensed UK aerodromes, including the provision of an aerodrome chart, an obstacle chart and Instrument approach procedure charts.

MAA response **Partially accepted**

MAA comment: It is accepted that the RAF Northolt AIP entry should be reviewed, however alignment of the data provided with that of other Licensed UK aerodromes is subject to the outcome of the final decision regarding the source document for the provision of Government Aerodromes discussed at recommendation 2017/06.

Recommendation 2017/08: Subject to recommendation 2017/01, the GACG re-invigorates the process for ensuring that as a minimum, tranche 1 of the Government Aerodrome list (as detailed in the MoU) are included in the civil AIP. (RAF Brize Norton, RAF Valley, RNAS Yeovilton)

MAA response **Rejected**

MAA comment: It is not considered appropriate to apply a different set of criteria to Government Aerodromes based upon the frequency of use by CAT. Publication and accessibility of data should be common for all such aerodromes to ensure consistency for all users. It is proposed that all 'tranche' taxonomy in this context be removed. A decision on resolution of future source document and accessibility of Government Aerodrome data highlighted at recommendation 2017/06 will direct future CoA.

Recommendation 2017/09: The MAA, MoD, DfT and the CAA should work together to resolve the problem of notifying military and civil differences to ICAO in pursuit of the successful closing of the corrective action plan. (AIP GEN 1.7)

MAA response **Accepted**

MAA comment: This work should be initially addressed through the GACG to ensure a common understanding and combined approach to resolving the issue.

Recommendation 2017/10: Any differences from ICAO for aerodromes available for civil use, should be clearly annotated in the UK Civil AIP. (Individual aerodrome entries.)

MAA response **Partially accepted**

MAA comment: Acceptance of this recommendation is subject to the outcome of further work proposed at recommendation 2017/06 and a decision on the future source document for Government Aerodromes data.

Recommendations 2017/11: The MAA should consider if the wording in Regulatory Article 3291 should be more explicit.

MAA response **Rejected**

MAA comment: The extant wording in RA 3291 has been reviewed and is considered clear and unambiguous.

Recommendation 2017/12: The CAA should accept the MAA invitation to witness their next audits of RAF Northolt and RAF Unit Swanwick.	
MAA response	Accepted
MAA comment: Complete. ██████████ CAA Head of Aerodromes, accepted the invitation and attended the recent audit of RAF Northolt.	

Recommendation 2017/13: The CAA should ascertain what MoD's plans are for the deployment of EMAS at RAF Northolt.	
MAA response	Accepted
MAA comment: At the GACG, 4 Oct 17, the MAA provided a verbal update on the MoD's plans for the deployment of EMAS at RAF Northolt and will provide a written update on the detailed plan for civil FW and RW aircraft ops during runway refurbishment works in 2018. The MAA will continue to monitor developments, engage with RAF Northolt and will provide more detail through the GACG in due course as deployment planning matures.	

Recommendation 2017/14: The MoD consider implementing RNP APCH for runway 07 at RAF Northolt.	
MAA response	Partially accepted
MAA comment: There is currently no intention to implement an RNP APCH at RAF Northolt. However, whilst ICAO/EASA and CAP 168 do not apply to the military, potential benefits of the provision of RNP APCH are acknowledged and remain a consideration for future development.	

Recommendation 2017/15: The MoD to confirm that controllers involved in providing ATM services to civil aircraft operating into RAF Northolt (and other Government Aerodromes) are aware of the importance of stabilised approaches and have received appropriate training.	
MAA response	Accepted
MAA comment: The MoD would welcome additional training material and guidance to ensure that existing, locally provided training is sufficiently comprehensive and remains valid.	

Recommendation 2017/16: The MAA, CAA and MoD set up a formal project to identify issues with standardisation of procedures and phraseology for the varied circumstances faced by both civil and military controllers.	
MAA response	Accepted
MAA comment: It is proposed that such a review is initially established and co-ordinated by the CAA-chaired Procedures and Phraseology Working Group. Through this, the MAA is co-author of CAP413 and will remain fully engaged in matters of standardisation.	

Recommendation 2017/17: The CAA should impose a condition that when there is a tailwind component at RAF Northolt, noise abatement procedures are suspended. EGWU AD 2.21 (a) should be amended accordingly.	
MAA response	Partially accepted
MAA comment: It is proposed that further engagement between all key stakeholders be undertaken to better understand the extent of this issue in terms of frequency of occurrence, level of risk and potential 2 nd order effects.	

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This paper contains sensitive information regarding a safety review and should not be circulated without the approval of the Safety and Business Assurance team. Any printed copy is to be kept secure.

Review into the CAA's oversight of the Civil Commercial Air Transport Use of RAF Northolt

Introduction

1. Following direction from the CAA Board, a team was established to review the safety of civil aircraft using RAF Northolt (The Review) and the report below is a collection of findings, observations and recommendations. Annex 1 explains how the team used an iterative process to examine the issue.
2. At the core of this review are two findings which will be discussed in further detail:
 - a. **Only limited assurance could be gained from the workings of the Government Aerodromes Coordination Group (GACG), which is designed to be the prime method by which the CAA and MAA share information.**and,
 - b. **Only limited assurance could be given on the quality and availability of information provided to operators of Commercial Air Transport (CAT) using RAF Northolt.**
3. There are other observations within the report with associated recommendations but it is felt that these two areas are a priority for the CAA to resolve, if it is to be satisfied that it can be assured of the safety of civil aircraft using RAF Northolt.

Aim

4. In reviewing the CAA's oversight of the civil use of RAF Northolt, the team first developed two questions to more clearly establish the bounds of the review. It is important to note, that routine regulatory oversight of RAF Northolt is within the purview of the MAA and therefore, the questions are necessarily limited to the CAA's legal duties.
 - a. **Is the CAA aware of its regulatory responsibilities regarding the civil use of RAF Northolt?**
 - b. **Is the CAA fulfilling its regulatory responsibilities regarding the civil use of RAF Northolt?**
5. The first of these questions led to an examination of the respective roles of the CAA and the MAA, including an understanding of what practical measures the MoD have in place to mitigate any risks to aircraft using the aerodrome. (This is explained in more detail at Annex 2¹). The review examined the legal framework establishing the CAA's oversight obligations and how those obligations are exercised.

What this review was not

6. This review is not a regulatory audit of the aerodrome of RAF Northolt as would be conducted by an aerodrome inspector. Whilst many of the infrastructure issues were discussed and examined, it is the MAA's responsibility to conduct regulatory audits of this aerodrome and its staff, in order to determine compliance with military regulations. There have been comments made from some parties about specific infrastructure issues at Northolt

¹ Review team, interviewees and methodology.

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and whilst this is not within the legal vices of the CAA, a view is offered of some of the main topics such as arrester beds, runway end safety areas and obstructions but, these hazards are primarily for the MoD to mitigate against.

7. The review identified opportunities to strengthen or add safety barriers in some cases.²
8. This report is divided into two parts. Part 1 focuses on the two questions in para. 4 and focusses on 6 themes that emerged whilst answering those questions. Part 2 focuses on specific comment that we have on other issues under the oversight of the MAA.

PART 1 – EXAMINATION OF THE AREAS OF FOCUS

Areas of Focus

9. Six themes emerged during the review. These are:
 - a. **Accountability**- Understanding the responsibilities and accountabilities of individuals in the assurance process with regard to Government aerodromes.
 - b. **GACG³** - The clarity and availability of information provided by the MAA/MoD to the CAA, through the GACG that enables the CAA to come to a conclusion on assurance.
 - c. **Aeronautical Information** - The clarity, quality and availability of data provided to AOCs using Government Aerodromes, through the normal civil system of notification.
 - d. **ICAO Differences** - The differences with ICAO SARPS that may or may not be notified by the MoD.
 - e. **Peer Review** - The opportunity for a peer review of the MAA's oversight processes.
 - f. **Oversight** - The effectiveness of the CAA's oversight of AOC holders using Government aerodromes.
10. Focus area (a) deals with Question 1, and Focus areas (b)-(f) deals with Question 2.

Recommendations:

11. The report sets out a number of recommendations which are laid out in the report and summarised at annex 3.
- (a) **Accountability – Legal position**
12. In examining the question, '**Is the CAA aware of its responsibilities?**' it is necessary to determine the legal construct within which the CAA operates. This construct includes international obligations to ICAO under the Annexes to the Convention on International Civil Aviation of 1944, European Law as laid down in the Single European Sky Regulations and Regulations developed under the EASA 'Basic Regulation'⁴. The CAA is also subject to domestic legislation such as the Civil Aviation Act 1982 and the Air Navigation Order (ANO) the current version being 2016, as well as other related national regulations. The CAA issues detailed guidance to industry indicating best practice in this area, for example Civil Aviation Publication (CAP) 168.
13. The operators of interest are those who engage in Commercial Air Transport (CAT) and hold an Air Operator's Certificate (AOC). The review has not concerned itself with GA aircraft,

² Often referred to as 'Leading Beyond Authority' And part of the CAA's INFLUENCE strategy.

³ Government Aerodromes Coordination Group

⁴ Commission Regulation (EC) No 216/2008 of the European Parliament and of the Council of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency

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specifically those not conducting CAT, below 2730kgs or not undertaking aerial work. This specific sector was not included because the CAA's policy is primarily concerned with the safety of the consumer (using CAT) and the CAA has a deregulatory approach to the wider GA industry as detailed in its GA programme. A person undertaking Commercial Air Transport is obliged to operate that aircraft in accordance with the terms of an EU-OPS Air Operator Certificate⁵

European legislation

14. At the forefront of European law where it references the 'military', is a high level requirement that where facilities or services are provided by the military to civil aircraft, those facilities or services should demonstrate an equivalent level of safety to the essential requirements laid down in the EASA Basic Regulation.⁶
15. **Commission Regulation (EU) No 965/2012 of 5 October 2012** laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No 216/2008 sets out the general framework for civil flight operations and establishes requirements on aircraft operators to determine the adequacy of an aerodrome before they use it.
16. Regulation 965/2012, Part CAT.OP.MPA.105 states that:

'The operator shall only use aerodromes and operating sites that are adequate for the type(s) of aircraft and operation(s) concerned.'
17. An adequate aerodrome is defined in CAT.OP.MPA.107 as adequate if:

'at the time of use, the aerodrome is available and equipped with necessary ancillary services such as air traffic services, sufficient lighting, communications, weather reporting, navigation aids and emergency services'.
18. These provisions are fundamental to the question of the suitability of RAF Northolt for use by civil CAT, as they place a clear responsibility on the operator to determine, through its own safety Management System (SMS) and operations manual, using the information provided, that an aerodrome is adequate. This practice is global and there are many sites across the world, not under the CAA's oversight that are assessed for their suitability on a routine basis by AOC holders.

Domestic legislation

19. The ANO sets out the law for the use of UK airspace and facilities but, as with any national legislation, is subordinate to EU law where there may be a conflict. The ANO also does not apply outside of the jurisdiction of the territory of the United Kingdom. Articles 207 and 208 set out the use of aerodromes by civil aircraft. To be clear, CAT.OP.MPA.105, as mentioned above, places obligations on the operator to determine aerodrome suitability, not the UK regulator.
20. **Articles 211 and 212 of the ANO** set out the legal basis for use of government aerodromes and the licensing by the CAA of civil aerodromes. Article 211 states that:

With the concurrence of the Secretary of State and subject to such conditions it deems appropriate, the CAA may notify any Government aerodrome as an aerodrome available for the take-off and landing of aircraft flying on flights for the purpose of—

(a) the commercial air transport of passengers;

⁵ ANO articles 102 and 103.

⁶ EASA Basic Regulation EU 216/2008 as amended article 1.3

(b) the public transport of passengers; or

(c) instruction in flying,

21. So through article 211 the CAA can set conditions it deems appropriate. The Review has borne this in mind as the work has progressed.

The 2015 Northolt Judgment and resulting Memorandum of Understanding

22. In 2012, the MoD decided to increase the cap of civil movements, from 7,000 to 12,000 a year, which then triggered an application for Judicial Review from Oxford and Biggin Hill aerodromes.
23. In January 2015 an application for a Judicial Review⁷ into the civilian use of RAF Northolt was rejected, but the judgment by Justice Popplewell stated that, (in essence) whilst the requirements of the ANO along with the guidance in CAP 168 (and therefore ICAO/EASA) did not apply at a Government aerodrome, and the CAA still

“has a complementary duty under Article 210 of the ANO to publish details of those safety standards in the AIP with regard to government aerodromes which accept a considerable volume of civilian air traffic or which have other strategic significance (e.g. if close to Heathrow flight paths). To fulfil that duty, the CAA maintains a dialogue with the MAA as to its compliance with the relevant international safety standards and periodically reviews notification. As part of that process, the CAA has the power to impose conditions on notification, but any such conditions must be such that they do not trespass on the regulatory regime which is overseen by the MAA.”

24. The Secretary of State for Defence established, by Charter, the UK's Defence Safety Agency (DSA) to be responsible for all Defence Safety Regulators. As part of the DSA, the Military Aviation Authority (MAA) regulates all Defence aviation activities. This is achieved through the establishment and maintenance of an appropriate regulatory framework that is given effect by certification, oversight and approvals processes extending across the acquisition, operating and continuing airworthiness domains within the UK DAE. The MAA also facilitates continual improvement in the MOD's Air Safety performance and assures compliance with extant safety standards and regulatory requirements
25. Following the judgment, in November and December 2015 the CAA and the MAA signed a Memorandum of Understanding (MoU) regarding the safety regulation oversight of civil aviation at government aerodromes (not exclusively RAF Northolt).

(b) GACG.

26. Pursuant to the MoU mentioned above, the Government Aerodromes Coordination Group (GACG) was set up towards the end of 2015 with the aim of allowing the CAA to maintain an appropriate level of safety regulatory oversight of the civil use of Government aerodromes. The group is expected to facilitate the exchange of data by which the CAA can determine if any conditions (as defined in ANO article 211) should be applied. In examining the MoU the review considered that not only should the MoU be reviewed as required in the terms of the document but that the scope of the agreement be widened. The review considered these changes were required because there is evidence that the GACG has been less than effective due to a number of factors.
- a. The restricted scope of the meetings (ICAO Annex 14 only).
 - b. The low frequency of meeting.
 - c. The lack of any formal pre and post meetings with Flight OPS (FOPS) and ATM.

⁷ Case No: CO/12787/2013 R (Oxford Aviation Services and Biggin Hill Airport) v Secretary of State for Defence, Civil Aviation Authority and Secretary of State for Transport

- d. The lack of notification through this process of RAF Northolt runway closure in 2018. Runway is being resurfaced.
 - e. The group not being able to ascertain at the January 2017 meeting, the status of the EMAS⁸ replacement project.
 - f. The significant number of Government Aerodromes within the MoU without any entry in the civil AIP.
 - g. No recorded review of the MoU as required in the terms of the agreement.
27. Of these issues, the one of most concern is that the GACG focus is on ICAO Annex 14 only (Aerodromes). Whilst the rationale for this is understood, it leads to incomplete representation from both the CAA and the MAA and means that any discussion might not be looking at the total risk picture. On the CAA side, representation is solely from Aerodromes (Annex 14 focus) and there is no active involvement from either ATM or Flight Operations. If the appropriate questions are to be asked of the MAA, suitably informed representation should be provided. This is especially important as the MoU encompasses 27 Government aerodromes, all of which will have unique hazards and associated risks.
28. There appears to be no internal CAA pre-meeting to discuss any concerns, progress of actions or emerging risks and additionally, there is no formal post meeting process encompassing representatives from Aerodromes, ATM, Flight Operations and International Strategy and Engagement (ISE)⁹. Such a meeting is where decisions should be recorded and conclusions made on the basis of information and evidence provided, including occurrence reports that may involve civil aircraft. There is no nominated individual accountable for the quality of this process and no effective audit trail that clearly defines how SARG is assured of the safety at Government Aerodromes.

Recommendation 2017/01: The CAA involvement with the GACG should be bolstered to include ATM, FOPS and International Strategy and Engagement (ISE) of the International Directorate (ID). This may take the form of actual attendance or a pre-meet where risks can be discussed. Consideration should be given to the need for DfT involvement¹⁰.

Recommendation 2017/02: The MAA should be asked to ensure that suitably qualified and informed representation be provided at the GACG. (This might mean representation from the front line commands). This may take the form of actual attendance or a pre-meet where risks can be discussed.

Recommendation 2017/03: The GACG MoU be reviewed to determine its appropriate scope over and above just ICAO Annex 14.

Recommendation 2017/4: A formal CAA internal process should be established to ensure that any information, including occurrence reports is shared amongst other SARG teams and a formal record made of any decision or conclusion made after validation of that information.

Recommendation 2017/5: An individual within the CAA should be nominated as accountable for the processing and validation of information received from the MAA/MoD.

(c) **Aeronautical Information.**

29. ICAO Annex 15 requires member States

⁸ Engineered Material Arresting System

⁹ This is the group that liaises with ICAO among others and specifically deals with SARPS and UK differences etc.

¹⁰ Particularly when considering the need for the DfT to be assured of an equivalent level of safety from the MoD.

to ensure that the aeronautical data and aeronautical information provided are complete, timely and of required quality and specifically, a list of significant differences between the national regulations and practices of the State and the related ICAO Standards, Recommended Practices and Procedures, given in a form that would enable a user to differentiate readily between the requirements of the State and the related ICAO provisions¹¹.

30. It also requires that,

formal arrangements are established between originators of aeronautical data and aeronautical information and the AIS in relation to the timely and complete provision of aeronautical data and aeronautical information.

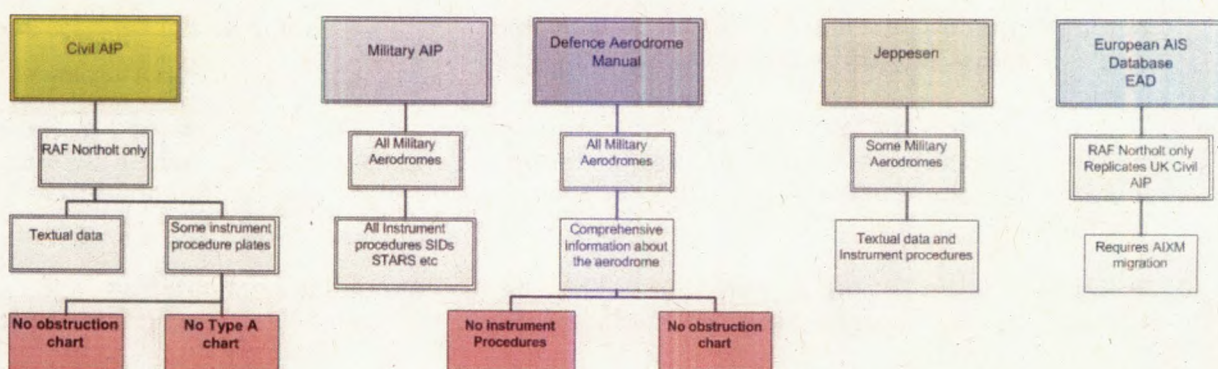
31. Commission Regulation 73/2010, the aeronautical data quality regulation sets out the requirements for the quality of such data in the European Single Sky. It specifically mentions the military in recital 10, where it states,

Military organisations providing aeronautical information for use in general air traffic operations are an essential part of the aeronautical data process and Member States should ensure that the quality of such data is sufficient to meet its intended use.

32. Noting that the requirement to 'ensure' falls on the Member State, not the CAA, it does follow that should either the MAA or the CAA be aware of information pertinent to the safe operation of aircraft then the 'formal arrangements' in place should bring that information to the attention of the operator, so that operator can make a further determination. Within the UK, that information would be provided through the civil AIP¹², AIRAC amendments or indeed by NOTAM. Attention should be placed therefore, on the availability and quality of data that will enable AOC holders to come to an assessment of the adequacy or not of a particular airfield and these issues are examined below.

(i) **Aeronautical Information - What information is available?**

33. There are a variety of sources of information available to aircraft operators using Government aerodromes, some of it free and some of it for a fee (£100-200 per month for access to UK Military Flight Information publications (MilFlips)).



(ii) **Aeronautical Information – Should information be in the Civil AIP**

34. It is clear from the examination of the legal framework that the provision of information to operators is of significant importance. This view is backed up by interviews undertaken with

¹¹ 4.1.2 AIP shall include in Part 1 — General (GEN):

¹² Where the aerodrome is licensed or certificated by the regulator.

Flight Operations inspectors, including the inspector responsible for the business aviation sector but, the team did not ascertain the views of the operators themselves directly.

35. Any data provided should be **complete, timely and of the required quality**. The Review noted that the information provided on RAF Northolt is not standardised across the various sources (MilAIP, Jeppeson, Civil Aeronautical Information Publication (AIP)) and the civil AIP entry is incomplete. In the light of this non-standardisation, one option available to the CAA; in order to ensure the wider integrity of information provided in the UK AIP; is to remove any information regarding Government aerodromes which does not meet the required standard¹³. Such an action would make it clear that there was no implied endorsement of the information presented, about any particular Government aerodrome.
36. The MoU signed between the MAA and the CAA does not stipulate where such information should be provided bar 'through the aerodrome's DAM and (non-specifically which Mil or Civ) AIP'. Across Europe, in most cases, military aerodromes that accept CAT appear in the state's Civil AIP, some Military AIPs are free to use¹⁴ and the European Commission's ambition is for all civil and military AIP information to be included in the European AIS database (EAD)¹⁵. The Military AIP is a publication not free for civil users unlike the Civil AIP published by NATS as part of their licence.
37. When considering the State's obligation for the safety of civil aircraft and the consumers flying in those aircraft however, the Review considered it appropriate that every effort should be extended to ensure the availability and accuracy of data and information, so that operators can make a determination on the suitability of a particular site. This is especially important for ad-hoc users who may not have visited the aerodrome concerned before and whose operations department would not have conducted a thorough 'route assessment'¹⁶. It is understood that Government aerodromes are Prior Permission required (PPR) only but, there are commercial and time pressures that may lead to difficulty sourcing complete information. The review considered that on balance, all information of Government aerodromes should be included in the Civil AIP.

Recommendation 2017/06: The MoD and DfT should determine if all Government Aerodromes should be included or removed from the civil AIP

38. If the premise is accepted that information and data on Government aerodromes should be provided, then it is right to examine its quality and completeness.

(iii) Aeronautical Information – Civil AIP

39. The review noted that despite there being a number of airfields detailed in the MoU between the MAA and the CAA, including 4 in the first tranche, RAF Northolt was the only airfield with any information in the Civil AIP. Neither RAF Brize Norton, which regularly receives large civil transport aircraft nor RAF Valley which is the destination aerodrome for a Public Service Obligation (PSO) scheduled service from Cardiff¹⁷, appear in the civil AIP.
40. The Civil AIP entry for Northolt (EGWU), does not include a chart of the aerodrome, nor Standard Arrival Charts (STARS) or an Instrument Approach Chart for either runway. Unlike

¹³ In such a case, all military sites are **removed** from the AIP but a condition placed on the MoD is that they provide a CD Rom (including any updates) to all civil operators that use the military airfields and that the Mil AIP includes all Tranche 1 and 2 aerodromes. A standing agenda on the GACG could confirm this takes place

¹⁴ The Danish Air Force <http://www.flv.dk/milais/>

¹⁵ EAD lets aeronautical information providers – including AIS organisations from civil aviation authorities, air navigation service providers and military administrations in the European Civil Aviation Conference (ECAC) area – enter and maintain their data in a central repository. At the same time, EAD enables data users – such as aircraft operators, private pilots and the general public – to retrieve and download AIS data from the system in real-time.

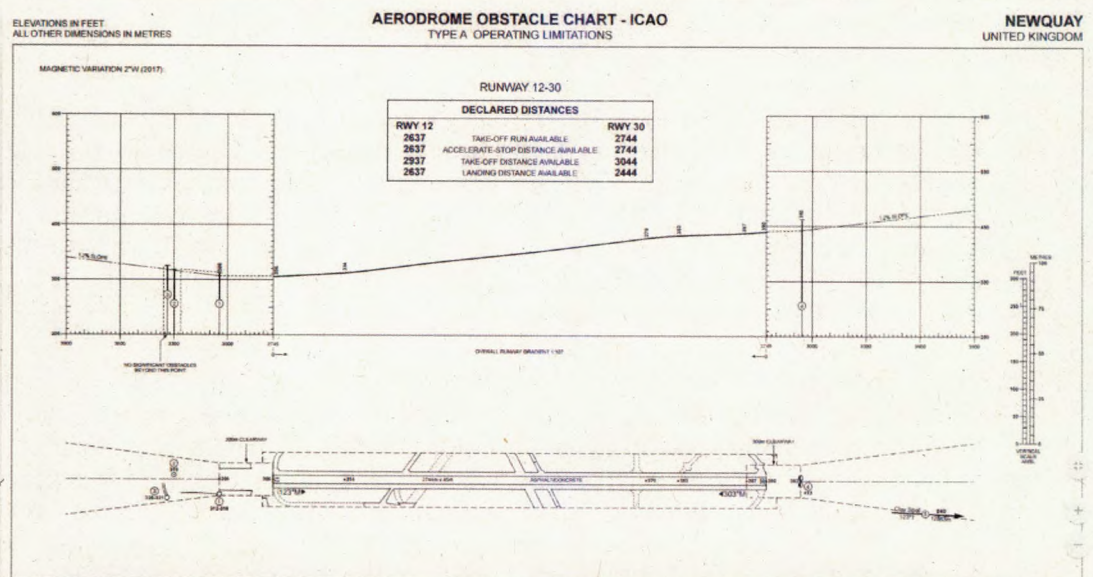
¹⁶ Routine users of aerodromes would conduct assessments such as aircraft performance and identify hazards as part of their planning to use the aerodrome for scheduled or routine flights.

¹⁷ Operated by Eastern Airways

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all other licensed civil aerodromes, the Northolt information does not include an aerodrome obstacle chart – Type A, with only tabular information provided in the main textual information entry.

Example of a Type A obstacle chart



Recommendation 2017/07: A review should be made of the RAF Northolt AIP entry and edits made to ensure it matches the standard required of other Licensed UK aerodromes, including the provision of an aerodrome chart, an obstacle chart and Instrument approach procedure charts.

Recommendation 2017/08: Subject to recommendation 2071/01 The GACG re-invigorates the process for ensuring that as a minimum, tranche 1 of the Government Aerodrome list (as detailed in the MoU) are included in the civil AIP. (RAF Brize Norton, RAF Valley, RNAS Yeovilton)

Aeronautical Information – The Defence Aerodrome Manual (DAM)

41. It is clear that significant work has gone into establishing and producing the DAM for RAF Northolt (As with many other Government aerodromes). It is available via the London VIP Airport website at <http://www.londonvipairport.com/docs/operatingmanual.pdf> and consists of 113 pages of information covering the layout of aprons, organisational structure, aerodrome infrastructure and facilities. RAF Northolt's DAM contains much more comprehensive information about the aerodrome than would be found in the Military or Civil AIPs. It is a very useful guide for visiting civil aircraft but, crucially, it does not contain any instrument plates or obstructions charts.

Aeronautical Information – Commercial Publications

42. The Pooley's RAF Northolt entry includes an Aerodrome chart but, no instrument approach procedures, nor obstacle chart. Examination of the Jeppesen entry shows that it does contain the STARS and Instrument approach charts and these appear to be a replication of the entry in the Military AIP, both of which contain much more comprehensive information than the Civil AIP entry. It is not known why there is a difference between the freely available

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information in the Civil AIP and the Commercial product of Jeppesen, which is the closest replication of information available in the Military Flight Information Publications (MilFLIPs) but, it is clear that the various sources of information on RAF Northolt are not aligned.

Aeronautical Information – CAA role

43. Whilst it is a State responsibility to set policy and ensure that the information provided is accurate and timely, the CAA has a role to play in providing such assurance. The GACG is the first line of defence in such assurance and should provide appropriate challenge to the MoD of the product it provides, removing any entry should it fail to reach the required standard. Internally, AAA have a role to play in ensuring the quality of information as part of their oversight of AIS.

ICAO Differences

44. The Civil AIP entry for RAF Northolt provides details of the aerodrome and procedures and includes a caveat that:

'Northolt is a Government aerodrome regulated by the Ministry of Defence. No guarantee can be given that this airfield meets the requirements of ICAO Annex 14 Volume I and II. Operators are to satisfy themselves that they have met all the requirements of the UK Air Navigation Order (CAP 393) and EU-OPS'.

45. This statement replicates the intent of the Assistant Chief of the Air Staff (ACAS) in his letter to the Department of Transport, dated 15 Feb 2013¹⁸ and supports the legal construct that it is for air operators to determine the 'adequacy' of an aerodrome. Individual differences to ICAO are not however, specifically identified in either the AIP, bar mention of taxiway lighting and approach lights. There are differences between MOD regulations and ICAO and differences between individual aerodromes and the MoD regulations. These issues are discussed below.
46. The United Kingdom is a signatory to the Chicago Convention. The state has an obligation to notify differences and as a department of the state, the MoD is equally obliged to fulfil its part in this process. At the last **ICAO USOAP¹⁹ audit in 2009 a finding** was raised, AGA/01 which stated:

The United Kingdom should establish a mechanism to ensure that safety oversight is performed on military aerodromes that are used for international civil operations by including these military aerodromes in the aerodrome certification process and other means.

47. The corrective action plan for the ICAO USOAP finding included 5 actions:
- h. Complete the Annex 14 checklist using JSP 554 requirements to confirm the level of implementation of relevant SARPS and send to CAA ASD for incorporation into the UK Annex 14 Compliance Checklist.
 - i. Confirm with CAA ASD those differences to Annex 14 that should be notified to ICAO and published in the UK AIP.
 - j. Provide a consolidated list of differences (civil + military) to CAA ICAO Focal Point (EIS).**
 - k. Notify consolidated list of differences to ICAO in accordance with Article 38 to the Convention and arrange for their publication in the UK AIP.**

¹⁸ Note that this letter only covers RAF Airfields and not those operated by the Royal Navy or Joint Helicopter Command
¹⁹ Universal Safety Oversight Audit Programme

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- I. Amend procedures to ensure that MoD DE²⁰ & HQ Air Cmd SO2 Aerodrome Infra²¹ are included in the ICAO State Letter consultation process for proposed amendments and adopted amendments to Annex 14, other relevant Annexes and related guidance material.
48. As of March 2017, some 8 years later, **items c. and d.**, above remain outstanding.
49. The ACAS in his 2013 letter committed to:

'identify specific examples of non-compliance at Military aerodromes stating that 'the MoD recognises its responsibilities to draw such potential disparities to the attention of civil operators'. ACAS went on to say that 'once the review is complete, the MOD will submit a consolidated list of differences...to the ICAO Oversight Audit Board and the CAA ICAO Focal Point'.
50. The ICAO Focal point received the list from the MoD at the end of 2013 however, this list is only correct up to amend 10 of the ICAO Annex and not amend 14. The information is also supplied in the incorrect format. Additionally, there are problems with notification to ICAO because for the state, there is only 1 compliance checklist and there is no facility to notify civil and military differences alongside each other. The ICAO finding also stated that 'a mechanism' needed to be established and the process is not yet a continual one and is unlikely to satisfy the intent of the finding.
51. If all the relevant differences were clearly annotated and detailed in the civil AIP, then this would make the task of AOC operators easier, when assuring themselves that RAF Northolt is an adequate aerodrome.

Recommendation 2017/09: The MAA, MoD²², DfT and the CAA should work together to resolve the problem of notifying military and civil differences to ICAO in pursuit of the successful closing of the corrective action plan. (AIP GEN 1.7)

ICAO Differences - Non-Compliance of a particular aerodrome with ICAO Annex 14

52. The differences provided by the MoD only include differences of their overarching regulations against the ICAO annexes as required in GEN 1.7. There still remains the issue of compliance at individual airfields and where they differ from both ICAO and the Military regulations. If we consider the need of an operator to determine if an airfield is adequate, they need to be able to find a reliable source of information both at a state level and at individual aerodrome level.
53. Whilst acknowledging that military aerodromes do not have to comply with ICAO SARPS, there are many aerodromes globally, that equally do not comply with ICAO SARPS or regional/national laws. These regional laws include the EASA Aerodromes regulation or in the case of UK sub-EASA aerodromes, the UK's ANO. The method used to inform users that the aerodrome is non-compliant, is through publication of differences at the State level, (when there is a uniform level of difference in the country concerned) or in the relevant AIP entry when a specific aerodrome is considered. Most States have a programme of resolving differences at aerodromes where they are able to make changes, such as signage or markings, but more permanent issues, such as geography and listed buildings, make compliance with ICAO more difficult.

²⁰ MOD Defence Estates

²¹ Title of the responsible Officer at Headquarters Air Command

²² To mean front line commands, Navy Command, Joint Helicopter Command and Air Command

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54. A difference with ICAO does not mean an aerodrome is unsafe for use. The objective is to ensure that such differences are notified and for the operator to determine, against such notification, that an aerodrome is adequate.

Recommendation 2017/10: Any differences from ICAO for aerodromes available for civil use, should be clearly annotated in the UK Civil AIP. (Individual aerodrome entries.

(e) Peer Review

55. The Judgment in the Northolt Judicial Review²³ was clear that the CAA should not trespass on the oversight of RAF Northolt by the MAA. The CAA has however, always had a close working relationship with the MoD, exemplified in its approach to the joint and integrated management of UK airspace among other arrangements. Both parties are keen to maintain close and effective cooperation and accordingly, the MAA has invited the CAA to witness its next audit of RAF Northolt and the Military Approach function in Terminal Control at RAF Northolt. Acceptance of this offer will provide the CAA with assurance of the level of scrutiny applied by the MAA during their audits.

(f) Oversight – PAR Approaches

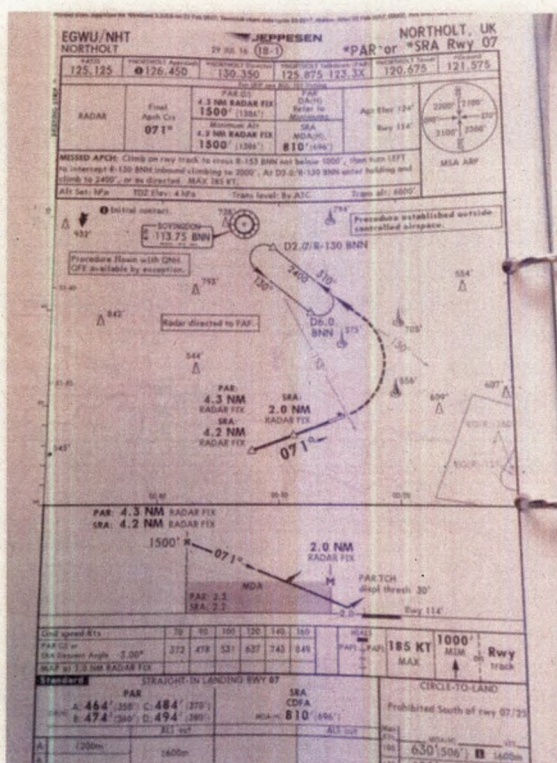
56. Precision Approach Radar (PAR) procedures are predominantly conducted by military aircraft mainly because they do not rely on any airborne equipment and also compensate for any battle damage. In such approaches, the ground based controllers provide direction in both elevation and azimuth, to enable aircraft to reach a height at which the pilot can decide to land or go around (Decision Height). The procedure requires pilots to have been trained in its use and to have conducted regular training, especially as the decision height can be as low as 150/200 feet in some cases. Some civil aircraft conducting work for the MoD will conduct PAR approaches as a normal part of their activity and it would be wrong to impose conditions on these aircraft who will have a training regime in place within their operations manuals. The main risk area is with ex-military pilots who work for business aviation organisations, who will not have such a regime or authorisation process in place and decide to conduct such approaches for a variety of reasons.
57. The Jeppesen entry for RAF Northolt includes an approach plate for PAR or SRA²⁴ for Runway 07 despite PAR approaches for civil aircraft not being normally allowed under Military regulations. MAA Regulatory Article 3291 states that military controllers '*should not assume that a civil pilot has been authorised and trained to fly a PAR*' in paragraph 39 it states '*If the captain of a civil Air System specifically requests a PAR, the approach should be provided*'.

²³ Case No: CO/12787/2013 R (Oxford Aviation Services and Biggin Hill Airport) v Secretary of State for Defence, Civil Aviation Authority and Secretary of State for Transport

²⁴ Precision Approach Radar and Surveillance Radar Approaches.

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Jeppesen Entry for RAF Northolt PAR Instrument Approach Plate



- 58. There is anecdotal evidence from CAA inspectors that some operators, who may have ex-military crews are conducting PAR approaches to government aerodromes on request and the CAA does not necessarily have routine oversight on whether such procedures are covered in a particular operator's operations manual. It was a PAR approach that EC-CKR conducted in 1996 before its crash and the procedures associated with this type of approach were noted by the AAIB as a causal factor²⁵ alongside poor CRM in the aircraft. This event led to an ILS being installed at RAF Northolt as mitigation for the risk of a runway excursion and specifically, to minimise of the chance of an unstable approach.
- 59. Unless operators have a specific approval in their operations manual to conduct PAR approaches, then civil aircraft should not be conducting them. The CAA might consider it appropriate to include such a caveat in the Civil AIP and ensure that the Jeppesen entry is also annotated accordingly. The MAA might consider making the nature of such a restriction clearer in its article 3219, with wording such as:

'Civil aircraft are not approved to conduct PAR approaches unless specifically authorised in their operating manual. Controllers should not therefore, provide a PAR approach to civil aircraft unless it is specifically requested'.

Recommendations 2017/11: The MAA should consider if the wording in Regulatory Article 3219 should be more explicit.

Oversight – UK AOC operators

²⁵ ILS does not require any fluency in language. Due to confusion the aircraft became high on the glidepath and was unable to control its speed effectively.

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60. The CAA has a continual programme of oversight of UK registered AOC operators. This oversight programme includes examination of operations manuals alongside discussion with the accountable managers about the risks each operator may be holding. Most operators using Government aerodromes in the UK will also be required to establish if aerodromes in other parts of the world are suitable and their internal procedures will be required to resolve such questions. The Review considered if any particular action was required with regard to AOC use of UK Government aerodromes and concluded that as long as an operator's management system was effective, there was no requirement to take dis-proportionate action. There was no evidence in interviews to suggest a need to examine the regime of oversight of the use of Operations Manuals. Government aerodromes open to civil use, mostly include measures that effectively put in place more safety barriers than other aerodromes around the world where such aircraft may operate. These barriers include air traffic control, radar monitoring of instrument approaches, Precision Approach Path Indicators (PAPIs), high levels of security which restricts access and controls vehicular movement etc.

Oversight - Foreign Operators

61. The review examined the issue of foreign operators flying into RAF Northolt and what the CAA's obligations were in that regard. There is contemporary evidence in a recent case that the CAA's legal options with regard to foreign operators are limited to the provision of foreign operator's certificates (through the DfT) and any permission to fly within UK airspace. Apart from these, the CAA has no legal levers over foreign operators save notification to their state of operation or EASA in the case of EU aircraft.

Recommendation 2017/12: The CAA should accept the MAA invitation to witness their next audits of RAF Northolt and RAF Unit Swanwick.

PART 2 - COMMENT ON OTHER ISSUES UNDER THE OVERSIGHT OF THE MAA

62. There has been a significant amount of correspondence between the CAA and other parties raising certain specific issues. Whilst these are predominantly under the oversight of the MAA, the Review also considered these issues as part of its work.

The Implementation of RESAs and Arrestor beds

63. Post the runway excursion in 1996 (see Annex 2), the MoD introduced Runway End Safety Areas at Northolt with embedded Lytag arrestor beds. The ANO, ICAO and EASA certification standards are clear that in some cases, optimum RESA dimensions may not be achievable due to a variety of reasons.

Dimensions of runway end safety areas It is accepted that many aerodromes were constructed before requirements for RESAs were introduced. For applicable runways where the RESA does not extend to the recommended distance, as part of their Safety Management System, aerodromes should assess the risk and implement appropriate and suitable mitigation measures as necessary²⁶

64. In the United States there are some 13 aerodromes where this is the case and all regulatory systems recognise that where such sub-optimal dimensions are in place and they cannot be increased due to geographical limitations (among other criteria), that other mitigating measures will be required. EASA Certification Standards states:

The RESA assessment should help the aerodrome operator identify the hazards and appropriate actions to reduce the risk. A range of measures may be available, singly or in combination, to reduce the risks of an overrun occurring or becoming an accident²⁷.

²⁶ EC 139/2014 GM1 ADR-DSN.C.215.

²⁷ Also reflected in CAP 168.

Additionally EASA Certification Standards(CS) state,

aerodrome operators should seek to optimise the RESA. This may be achieved through a combination of.....(v) installing suitably positioned and designed arresting systems, to supplement or as an alternative to a RESA where an equivalent level of safety is demonstrated

65. Whilst military aerodromes are not subject to ICAO SARPS (or indeed EASA 139/2014 and associated CS or CAP 168), the MoD has installed Lytag arrester beds in both RESA's at RAF Northolt. The ICAO minimum requirement for RESAs at civil sites is 90m, with a recommendation of 240 metres for an aerodrome such as RAF Northolt but, this is guidance only. If we are looking at an equivalent level of safety, ICAO, the FAA, EASA 139/2014²⁸ and the ANO through CAP 168 guidance, all allow for other mitigation measures, such as arrester systems to be added. This is the case where the optimum length of RESA cannot be achieved. There is ample evidence that Lytag beds are effective at arresting aircraft at speeds of 70 knots or less and in 90% of overrun cases, aircraft exit the runway at speeds of 70 knots or less²⁹. It is considered that the action taken by the MoD in this regard is reasonable and practicable. It is understood by the Review that the MoD had plans to install Engineered Material Arrester Systems (EMAS) at RAF Northolt but that the deployment of this system has been delayed.

Recommendation 2017/13: The CAA should ascertain what MoD's plans are for the deployment of EMAS at RAF Northolt.

66. One of the safety barriers both within the EASA regime and in the UK's ANO is to *improve the accuracy of delivery of an aircraft at the correct landing position on runways* and the minimisation of unstable approaches. The guidance to the ANO, CAP 168 states that aerodromes can as mitigation against a shortened RESA,

Consider RNAV³⁰ (GNSS³¹) approaches for runways with non-precision approaches.

67. Runway 07 has a 30 degree offset Surveillance Radar Approach (SRA)³² procedure. Course guidance is a normal practice for civil operators and whilst an extra challenge, there is no evidence to suggest that the procedure is unsafe. Nevertheless, safety barriers would be strengthened were the approach to Runway 07 be converted to a GNSS based procedure, which could then be flown automatically. Whilst ICAO/EASA and CAP168 do not apply to the Military, the MoD are partners in the UK's Future Airspace Strategy and a key theme of that strategy is to facilitate the use of Required Navigation Performance (RNP) Approach (APCH) functions for UK airport arrival procedures. The EASA Notice of Proposed Amendment 2015-01³³ states that

²⁸ CS ADR-DSN.C.215 Dimensions of runway end safety areas.

²⁹ Concerning aircraft overruns and undershoots in Runway Safety Areas (RSAs), 459 international accidents and incidents between 1978 and 2006 have been analysed (Hall et al., 2008). Landing overrun events (60%) occur more frequently than landing undershoots (20%) or take-off overruns (20%). Anomalies during accidents and incidents are mostly related to human error, weather, runway conditions, approach procedures, or other conditions or combinations thereof. Information concerning the dynamics of overrun events indicate that in 90% of cases, the aircraft exits the runway at 36 m/s (118 ft/s) (70 knots) or less

³⁰ Area Navigation (RNAV) is a method of Instrument Flight Rules (IFR) navigation that allows an aircraft to choose any course within a network of navigation beacons rather than navigating directly to and from the beacons. This can conserve flight distance, reduce congestion, and allow flights into airports without beacons.

³¹ The term 'global navigation satellite system' (GNSS) refers to a constellation of satellites providing signals from space transmitting positioning and timing data. By definition, a GNSS provides global coverage.

³² A procedure where the controller provides guidance in azimuth only.

³³ This Notice of Proposed Amendment (NPA) addresses the safety, interoperability, proportionality and coordination issues related to the implementation of Performance Based Navigation (PBN) within European airspace.

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PBN³⁴ approaches with vertical guidance (APV RNP APCH) will be required at all instrument runway ends, where there is currently only non-precision approach procedures published (PAR is excluded due to not being a civil procedure) and the aerodrome is in use by civil aircraft.

Recommendation 2017/14: The MoD consider implementing RNP APCH for runway 07 at RAF Northolt.

68. A further guidance measure to deal with limited RESAs in CAP 168 deals with unstable approaches.

In consultation with aeroplane operators and air navigation service providers formulate procedures to help ensure stabilised approaches.

Ensure an open dialogue between the aerodrome, air navigation service provider and aeroplane operators to raise awareness of the factors that could lead to a runway excursion.

69. The European Action Plan for the Prevention of Runway Excursions (EAPPRE) is the result of combined and sustained efforts of many organisations representing all areas of runway operations. The plan include many recommendations that cover aerodrome operators, air navigation service providers, aeronautical information service providers and aircraft operators. A key threat and precursor to loss of control and a runway excursion is an un-stabilised approach.
70. Air Traffic Controllers routinely contribute to the prevention of runway excursions by helping flight crews fly stabilised approaches by adhering to procedures and, for instance, avoiding short-cuts that prevent flight crews from losing the necessary height and speed during the approach. Moreover, through the provision of safety significant, "essential" information such as changes to surface wind, reduced runway lengths and runway surface conditions, Air Traffic Control ensures that flight crews have the latest aerodrome information available to enable safe takeoffs and landings. Breakdowns in these ATC functions can have unintended outcomes. For instance, sub-optimal control techniques such as late descent and inappropriate speed control can contribute to aircraft flying un-stabilised approaches with, statistically at least, an increased risk of runway excursion. In addition, interruptions, omissions or errors involving the flow of "essential" information may deprive flight crews of operational safety decision-making data at critical stages of flight.
71. EAPPRE recommendation 3.1 advises that the importance of a stabilised approach and compliance with final approach procedures is included in training and briefing for air traffic control staff.

Recommendation 2017/15: The MoD to confirm that controllers involved in providing ATM services to civil aircraft operating into RAF Northolt (and other Government Aerodromes) are aware of the importance of stabilised approaches and have received appropriate training.

72. A regular theme that arose during interviews with CAA inspectors and the MAA was the lack of standardisation of civil and military procedures, particularly phraseology. The delivery and content of the phraseology³⁵ used was a causal factor in the over-run event of 1996. The

³⁴ Performance-based Navigation (PBN) is helping the global aviation community reduce aviation congestion, conserve fuel, protect the environment, reduce the impact of aircraft noise and maintain reliable, all-weather operations, even at the most challenging airports. It provides operators with greater flexibility and better operating returns while increasing the safety of regional and national airspace systems.

³⁵ RAF phraseology during ground controlled approaches became staccato in nature due to the radio equipment in RAF service not being capable of duplex operation. And did not therefore allow an 'over speak' operation. This led to information being passed in short bursts punctuated by short transmission breaks. The RAF then developed standardised phraseology to be used during such approaches and were punctilious in its use.

OFFICIAL SENSITIVE

AAIB opined that the confusion over a gear check led the overloaded crew to climb above the glidepath which in combination with poor crew management and incorrect configuration led to the late landing and over run.

73. To the review's knowledge, AAIB recommendation 97-8 has never been satisfactorily resolved.

The Ministry of Defence should consider harmonising its ATC procedures with those laid down in the Manual of Air Traffic Services Part 1 as published by the CAA. This should be done to avoid the use of non-ICAO phraseology and procedures when controlling civilian air traffic at RAF airfields³⁶.

74. During its work, the Review also heard evidence from CAA inspectors and the MAA of such issues pertaining to civil air traffic controllers operating at MoD airfields providing services to both civil and military aircraft. It was apparent there is acknowledgement of this problem between all parties and a willingness to try and resolve it. Whilst there is some work under way in Air Command to update the MoU between the CAA and the MoD regarding phraseology and procedures, the Review believes that a much more formal project is needed to rationalise, harmonise and standardise civil and military ATM.

Recommendation 2017/16: The MAA, CAA and MoD set up a formal project to identify issues with standardisation of procedures and phraseology for the varied circumstances faced by both civil and military controllers.

75. When considering further mitigations against runway excursion, CAP 168 offers the following guidance:

Where possible reduce the number of tail wind landings and review any limitations in the use of reverse thrust due to noise abatement requirements.

76. The orientation of runway use at Northolt is determined with reference to the direction in use at London Heathrow. Whilst it is accepted that there will only be a difference on rare occasions, these different orientations might generate a tailwind component. In addition, RAF Northolt also has noise abatement procedures in place as stipulated in the civil AIP at EGWU AD 2.21. Whilst accurate wind information is provided by automated equipment at the aerodrome which is passed to aircrew, in cases where a tailwind exists, the airfield operator should remove any restrictions due to noise abatement, to ensure that maximum performance of the aircraft is available should it be required by the operator.

Recommendation 2017/17: The CAA should impose a condition that when there is a tailwind component at RAF Northolt, noise abatement procedures are suspended. EGWU AD 2.21 (a) should be amended accordingly.

Obstacles in Rwy 07 departure

77. There are obstacles in the departure plane of runway 07 at Northolt, as at many other aerodromes in the UK. It is the aircraft operator's responsibility to assess aircraft performance to ensure safe separation and the MoD's responsibility to ensure that departure procedures are well designed. One of the most significant hazards that existed during the history of civil operations at RAF Northolt was the South Harrow gas holder which was removed in 1999. This structure was some 240 feet in height and was situated only two miles from the threshold of Runway 25 and very close to the SID for runway 07. There has been no significant permanent development in the departure plane in recent years³⁷ and the MoD

³⁶ This recommendation should equally apply at airfields under Navy and Joint helicopter Command, not just 'RAF' airfields under Air Command.

³⁷ The MoD did experience some issues with cranes during the re-development of the Arla food depot in Victoria Road, South Ruislip.

OFFICIAL SENSITIVE

have taken measures to ensure that the area is appropriately safeguarded, including by objecting to a high rise development on the site of the former gas holder. Many of the other hazards, such as the petrol station and St Mary's Church have been in situ for many decades during the operation of the aerodrome. The main obligation for the CAA is to ensure that procedures exist to enable such hazards to be appropriately notified to operators and any temporary obstructions are brought to the attention of those using the aerodrome, in an expeditious and effective manner.

St Mary's Church spire (unlit).

78. St Mary's Church and its spire has been in situ since the construction of the aerodrome. There have been no recorded incidents of near misses with the church spire, despite it being unlit and it is additionally, a pin-point obstruction. In recent years, the RAF has installed ILS at RAF Northolt and approaches are monitored by its state of the art PAR system to ensure that aircraft do not fly below the glidepath³⁸. The Review concluded that the GACG should continue to debate this issue and determine a suitable outcome which could involve some form of visual or electronic conspicuity.

Conclusion

79. No system can be 100% safe. There will always be factors such as poor weather (rain, wind, snow, ice etc) or poor CRM in the aircraft, malfunctions of components such as engines or brakes etc, which will degrade safety barriers and lead to a higher probability of an accident. When examining RAF Northolt in the round, it can be seen that since the last significant event in 1996, several measures have been put in place which make the aerodrome tolerably safe³⁹. These include the establishment of RESAs, the construction of arrester beds to mitigate the sub optimum size of those beds, the availability of ILS on runway 25, with radar monitoring by a state of the art GCA system and the removal of the most significant hazard in the climb out of runway 07 (the gas holder). In addition, there is a strong command and control system in place at the aerodrome, overseen by the Military Aviation Authority that proactively looks at identification of risks and any measures to mitigate them. In addition to this, the type of aircraft operating at RAF Northolt have features of performance that are a considerable measure above those that have traditionally used the aerodrome.
80. Notwithstanding the more favourable level of safety that exists at the aerodrome in 2017, there are some measures that could be taken to further improve assurance that the aerodrome remains tolerably safe.
81. The review concluded that only limited assurance could be gained from the workings of the Government Aerodromes Coordination Group (GACG), which is designed to be the prime method by which the CAA and MAA share information and only limited assurance could be given on the quality and availability of information provided to operators of Commercial Air Transport (CAT) using RAF Northolt.

³⁸ **REGULATION (EC) No 216/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC- Annex Va**

(a) To protect aircraft proceeding to an aerodrome for landing, or for their departure from an aerodrome, arrival and departure routes or areas shall be established. Such routes or areas shall provide aircraft with the required clearance from obstacles located in the area surrounding the aerodrome taking due account of the local physical characteristics.

(b) Such obstacle clearance shall be appropriate to the phase of flight and type of operation being conducted. It shall also take into account the equipment being used for determining the position of the aircraft. (PAR monitoring)

³⁹ Safety risks assessed in the tolerable region are acceptable provided that appropriate mitigation strategies are implemented by the organization. A safety risk initially assessed as intolerable may be mitigated and subsequently moved into the tolerable region provided that such risks remain controlled by appropriate mitigation strategies. In both cases, a supplementary cost-benefit analysis may be performed if deemed appropriate. (ICAO Doc 9859 Safety Management manual)

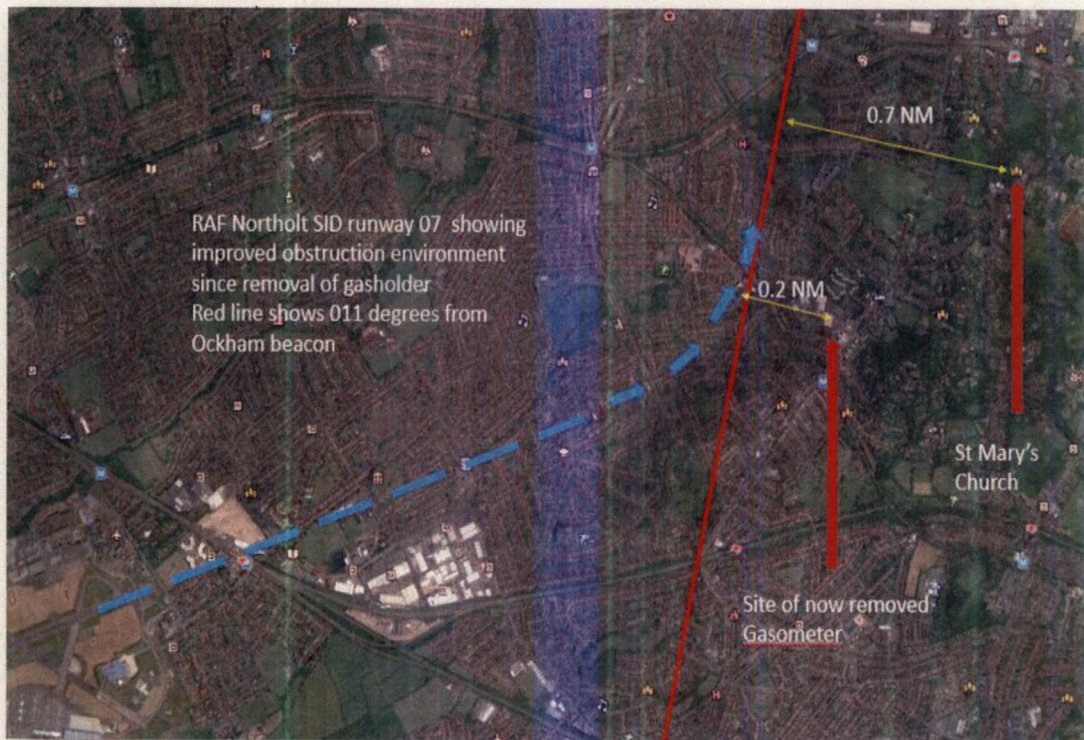
82. There are other observations within the report with associated recommendations but it is felt that these two areas are a priority for the CAA to resolve, if it is to be satisfied that it can be assured of the safety of civil aircraft using RAF Northolt.

History of RAF Northolt Operations

1. RAF Northolt has been in operation since 1915. A military airfield, during the construction of Heathrow Airport between 1944 and 1946 and on into the 1950s, it was the busiest civil airport in Europe. Since the Second World War, the aerodrome has been a base for communications and transport aircraft including many with lesser performance than today's business aircraft (Armstrong Whitworth Argosy, Short Belfasts, DH Devons and Herons) and has often accepted visiting civil registered aircraft. A decision was taken in the early 1980s to restrict the number of civil movements to 7000 a year, which equates to on average about 50% of all traffic using the aerodrome.
2. On 18 Oct 1942 a Vickers Wellington crashed near South Ruislip Station for unknown reasons.
3. On 4 July 1948 there was a mid-air collision whilst holding near Northwood between a DC6 of SAS and an Avro York C1 both inbound to RAF Northolt. Cause was due to possible atmospheric pressure setting issues.
4. 1 June 1960 an Avro Anson crashed after take-off due to engine failure. No fatalities
5. On 13 Aug 1996, following an unstable approach and incorrect configuration for landing, Learjet EC-CKR landed long on runway 25, over ran the runway and came to rest on the A40, impacting a Transit Van. The AAIB report made a number of recommendations including the installation of arrestor beds in the runway end safety areas.
6. In 1999, one of the most significant hazards in the approach to Runway 25 and the climb out of runway 07 was demolished. This was the 240' high South Harrow gasholder which was constructed in 1931. It was both a hazard (~490' below the glidepath) and a visual aid for pilots using the aerodrome being 2nm from touchdown and almost directly in line with the runway. The MoD has subsequently taken proactive action to prevent any high rise buildings replacing the structure. In contrast, the Spire of St Mary's church at 558' elevation, is some 570' below the glidepath, (an 80' greater margin of safety) so in the last 17 years, the obstruction landscape for RAF Northolt has improved.

South Harrow Gas Holder as viewed from Harrow on the Hill





7. The 'Project Ark' Technical and commercial assessment of future development options for RAF Northolt, written by Ernst and Young in 2012, highlighted options for an increase in movements to 20,000 and 50,000 per annum. In 2012, The MoD decided to increase the cap of civil movements, from 7000 to 12,000 a year, which then triggered an application for Judicial Review from Oxford and Biggin Hill aerodromes.
8. In January 2015 an application for a Judicial Review⁴⁰ into the civilian use of RAF Northolt was rejected but, the judgment by Justice Popplewell stated that, (in essence) whilst the requirements of CAP 168 and therefore ICAO/EASA did not apply at a Government aerodrome, the CAA still

"has a complementary duty under Article 210 of the ANO to publish details of those safety standards in the AIP with regard to government aerodromes which accept a considerable volume of civilian air traffic or which have other strategic significance (e.g. if close to Heathrow flight paths). To fulfil that duty, the CAA maintains a dialogue with the MAA as to its compliance with the relevant international safety standards and periodically reviews notification. As part of that process, the CAA has the power to impose conditions on notification, but any such conditions must be such that they do not trespass on the regulatory regime which is overseen by the MAA."

9. Following the judgment, in November and December 2015 the CAA and the MAA signed a MOU regarding the safety regulation oversight of civil aviation at government aerodromes (not exclusively RAF Northolt).

⁴⁰ Case No: CO/12787/2013 R (Oxford Aviation Services and Biggin Hill Airport) v Secretary of State for Defence, Civil Aviation Authority and Secretary of State for Transport

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10. In October 2016, the Government announced that a third runway at Heathrow was their preferred option, bringing that infrastructure, the new runway and associated traffic patterns within 4 miles of RAF Northolt by 2030.
11. In January 2017 the Safety and Business Assurance team was established in the CAA and the first review was tasked as being an investigation of the CAA's oversight of the civil use of RAF Northolt.

Review Team – Interviewees and Methodology

The Review Team

1. The review team consisted of:
 - a. Safety Assurance Lead – ATM Specialist⁴¹
 - b. Airspace Regulator – NATS Seconded and safety assurance specialist
 - c. Programme Head – European ATM (Independent of SARG)
 - d. Principal Legal Advisor (Independent of SARG)

Interviews

2. The following individuals were interviewed/consulted.

CAA

- a. **Head Aerodromes, ATM and Airspace** (Discussion about legal case, setting up of the GACG and subsequent work including accountabilities)
- b. **Head Flight Operations** (Discussion about oversight of AOCs, provision of information and risks)
- c. **Flight Ops Manager** (Discussion about oversight, provision of information, risks and practical experience of operating at Government aerodromes).
- d. **Manager Aerodromes** (Discussion about legal case, setting up of the GACG and subsequent work including accountabilities)
- e. **Aerodrome Inspector** (Discussion about legal case, setting up of the GACG and subsequent work including accountabilities)
- f. **Manager ATM** (Discussion about Military ATM provision to civil aircraft and Civil controllers at Military sites)
- g. **Flight Ops Inspector AOC General** (Discussion about availability and clarity of aeronautical information and business aviation procedures)
- h. **Policy Lead Flight Operations** (Discussion about European and national legal framework for Flight operations)
- i. **International Strategy and Engagement** (Discussion about ICAO aeronautical information framework, ICAO audits and findings)
- j. **Manager Safety Intelligence** (To understand what safety data was held on RAF Northolt and CAA's use of DASORS)
- k. **Safety Reporting Programme Lead** (To discuss whistleblowing reports)

MAA

- l. **MAA SO1 Oversight and Approvals Fixed Wing** (To outline intent of the review and gain support for close engagement)
- m. **MAA SO1 Oversight and Approvals ATM**(To outline intent of the review and gain support for close engagement)
- n. **MAA So2 Regulation ATM Aerodrome Infrastructure**(To outline intent of the review and gain support for close engagement)

Methodology

3. The review drew on some of the processes taught in the 'Mind at Work's' Multi Perspective Problem Solving (MPPS) tool and the methods used in generating safety bow ties. These 'tools' were used alongside a number of interviews of individuals and examination of a body of documentary evidence.
4. The MPPS tools were found to be particularly effective and indeed, the review team spent the first meeting establishing agreements between the parties involved, relative roles in the Review and examining, understanding and testing the problem statement. The problem statement was referred back to on a number of occasions and senior management was also asked to validate the statement before too much activity was undertaken. A key benefit to the

⁴¹ Including 18 years of Aerodrome Control, Ground Control, Terminal and Area Radar experience.

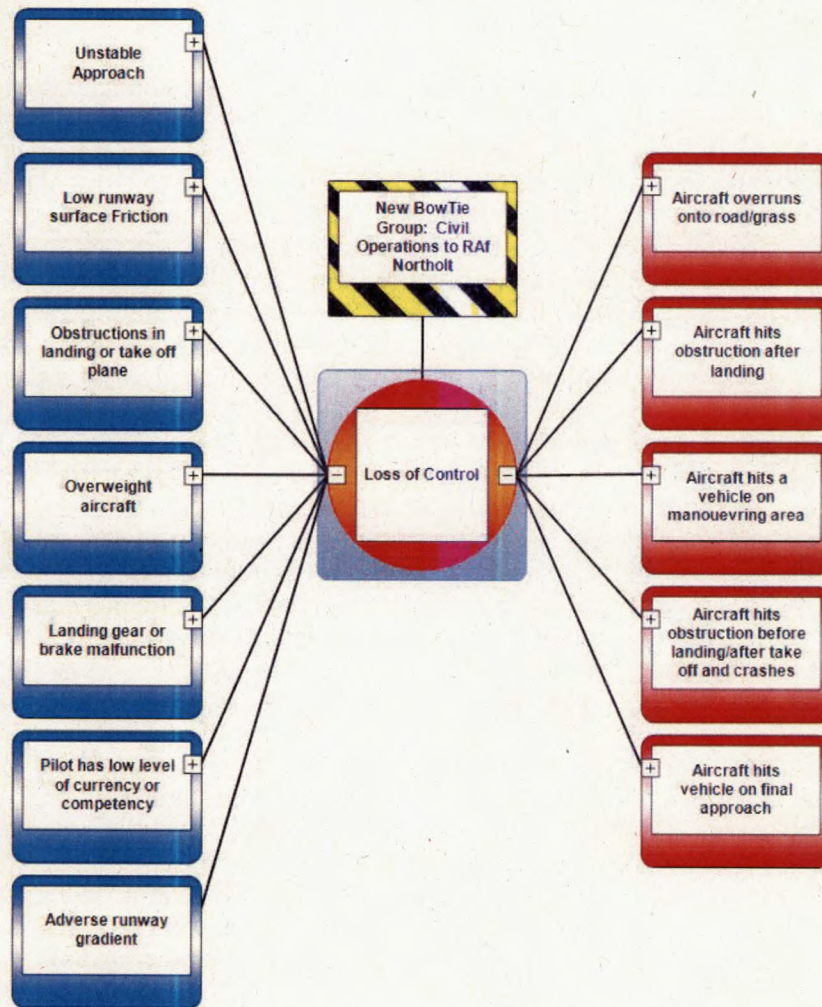
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Review was the diversity and independence of the team. This gave a broad perspective on matters and allowed fruitful debate. The Review was also time bound, which kept momentum.

5. Resource was gained from volunteers within the CAA offering about 10 hours of their time s effectively a 'challenge panel', whilst undertaking their 'day job'. Whilst this arrangement worked well for this Review, it is clear that as the Safety Assurance role develops and grows, a more formal arrangement is required. Having a team leader who guards the process and leads the team as a permanent member of Safety Assurance has significant benefits but, without further resource, all administrative tasks and report writing falls also to this permanent member. The Review considered that for future work, secondees would be beneficial on a 6 moth or yearly basis, which would enable the team to take on more tasks and also work towards career progression and development for other CAA colleagues. It was noted that this replicates the methodology used for EASA Rulemaking tasks.
6. To aid the objective assessment of the task, two bow tie diagrams were constructed, the first focussing on the top event of 'Loss of control on landing' and the second, looking at the hazards from the regulatory viewpoint and focussing on the central event of 'RAF Northolt not meeting safety criteria and standards'. Both bow ties were developed using information available and then the effectiveness or otherwise of the barriers was examined. The Review found this method of analysis very powerful and it enabled the team's focus to be in the correct place at an early stage of the Review. There are plans within Safety and Business Assurance to further develop this work in other areas to determine the existence and effectiveness (or otherwise) of safety barriers alongside accountability.
7. For this task, the main threats and consequences for each hazard were identified and these are summarised on the diagrams below. It is important to remember that the barriers in place for the 'Loss of Control on landing' event are the responsibility of the MoD to apply and for the MAA to oversee. These bow ties were constructed purely to better understand the infrastructure in place, the regulatory landscape and to identify any potential areas of deficiency. Whilst the CAA does not have the legal power to apply a particular barrier, it can impose conditions of use on civil operators, based on evidence provided.

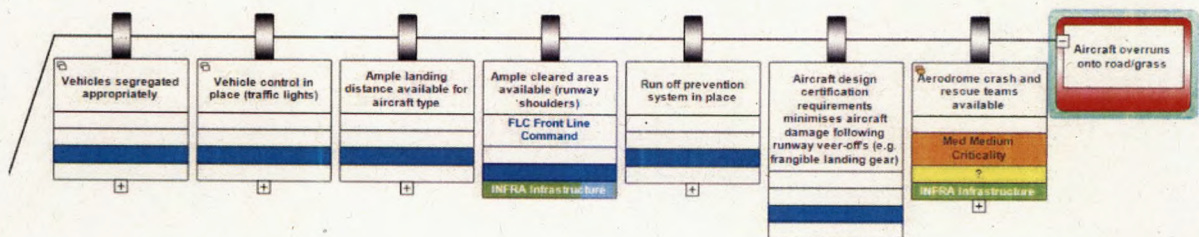
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Overview of bow tie construction



8. From analysis of the bow tie model and supporting evidence it was clear that significant mitigation had been put in place since the 1996 crash to prevent a re-occurrence. The right hand side of the bow tie, providing barrier post 'top event' appears reasonably practicable and proportionately robust.

1Expansion of the overrun consequence analysis

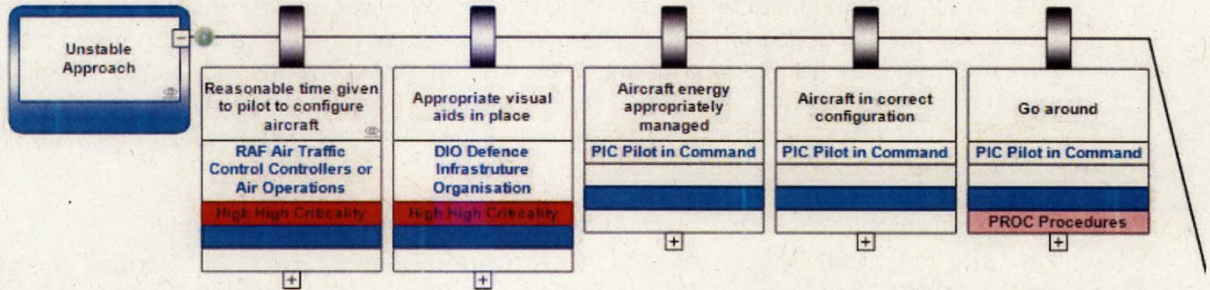


9. When looking at the left hand side of the bow tie, to the threats and their associated barriers against pre-cursor events, there was less assurance regarding the effectiveness of controls. One pre-cursor to a loss of control on landing is the threat of an unstable approach. At RAF Northolt there are a number of conditions that could cause such instability including but not limited to, Controller actions, false capture on the runway 25 ILS, an offset approach to

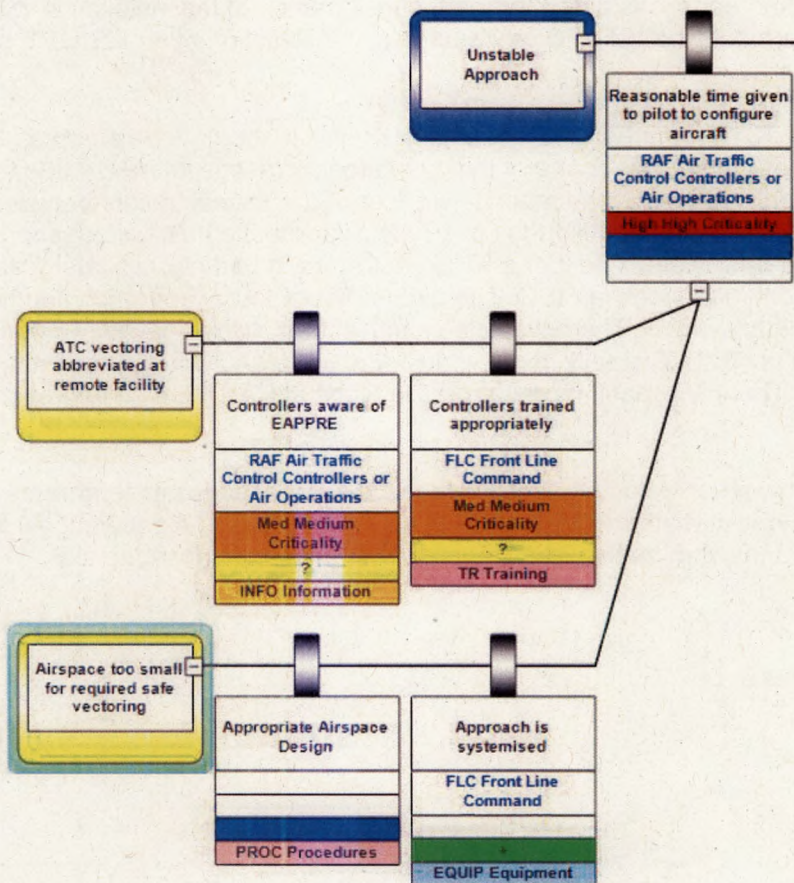
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runway 07 using SRA, the 3.5 degree Glidepath on runway 25 and the constrained airspace and proximity to the Heathrow approach and departure routes. Procedures are usually the most effective barriers to prevent an unstable approach and these range from company standard operating procedures (in the civil aircraft operator's organisation), information provided by AIP, NOTAM etc. and air traffic control procedures and training.

Expansion of the Unstable Approach threat analysis



Exposure of the escalation factors in time to configure aircraft



- When looking at the relevance of pre-cursor events it is worth also looking at some relevant accidents.

Event analysis

11. If loss of control on landing is considered as the main event within the bow tie model, then there are three pertinent events that offer some valuable data. These are the 1993 overrun and crash of Cessna G-JETB at Southampton, the 1996 overrun of Learjet EC-CKR at RAF Northolt, and the 2016 crash of Embraer 505 HZ-IBN at Blackbushe.

Southampton Crash.

12. On 26 May 1993, Cessna Citation G-JETB overran RWY 20 at Southampton and came to rest on the nearby M27 motorway, collided with two cars and caught fire. The AAIB investigation cited causal factors as being landing on a wet runway, with a tailwind that exceeded the aircraft certification. There were some crew resource management issues in play and with the tailwind component, there was not enough landing distance available. The report recommended the fitment of a ground arrester system and this work was carried out by the airport which now has a Lytag arrester system in the Runway End Safety Area of RWY 20.

RAF Northolt Crash

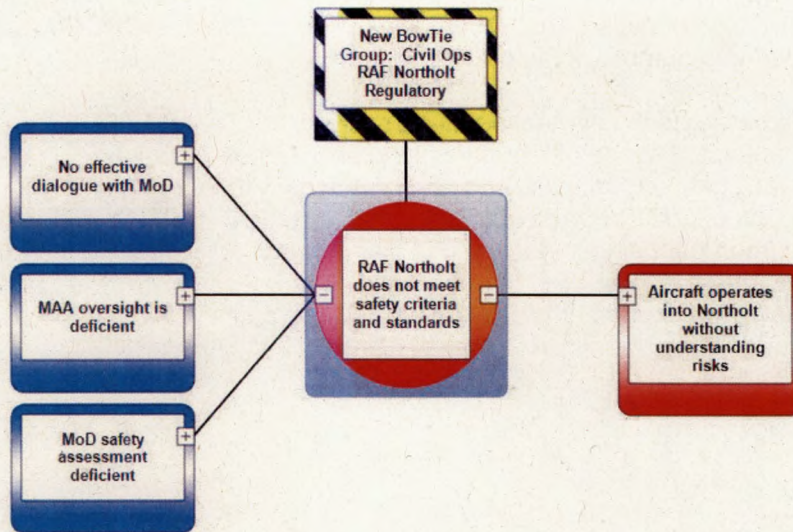
13. On 13 August 1996 Gates Learjet EC-CKR overran Runway 25 at RAF Northolt and came to rest on the A40 colliding with a Ford Transit van. The AAIB investigation reported causal factors as being the commander landing the aircraft at too high a speed and too far along the landing surface, which combined with the lack of spoiler deployment, meant that there was insufficient landing distance available. The report cited the 1993 incident at Southampton and made recommendations which included consideration of the installation of an arrester system, harmonisation of ATC procedures and installation of an ILS/DME system.

Blackbushe crash

14. On 31 July 2015, Embraer 505 Phenom, HZ-IBN crashed after a steep and fast approach at Blackbushe Airport. This is one of the most recent crashes in the UK due to an overrun event but, it is worth noting several main differences in the causal factors between this fatal event and the Southampton and Northolt overruns. Blackbushe has a much shorter runway with a LDA of 1059m. There is neither a RESA nor arrester bed at Blackbushe and no Air Traffic Management facility only a FISO. The aircraft flew a visual approach and no instrument approach was available. There was also a mix of traffic types of vastly differing speeds (Microlight conflict). Crucially this operator was not an AOC holder and it was a single pilot operation. There are many more barriers in place at RAF Northolt to prevent this kind of event.
15. The first bow tie constructed above was to look at the landscape of threats and consequences that are the MoD and MAA's responsibility. A second bow tie was then constructed to examine the CAA Regulatory threats and consequences.

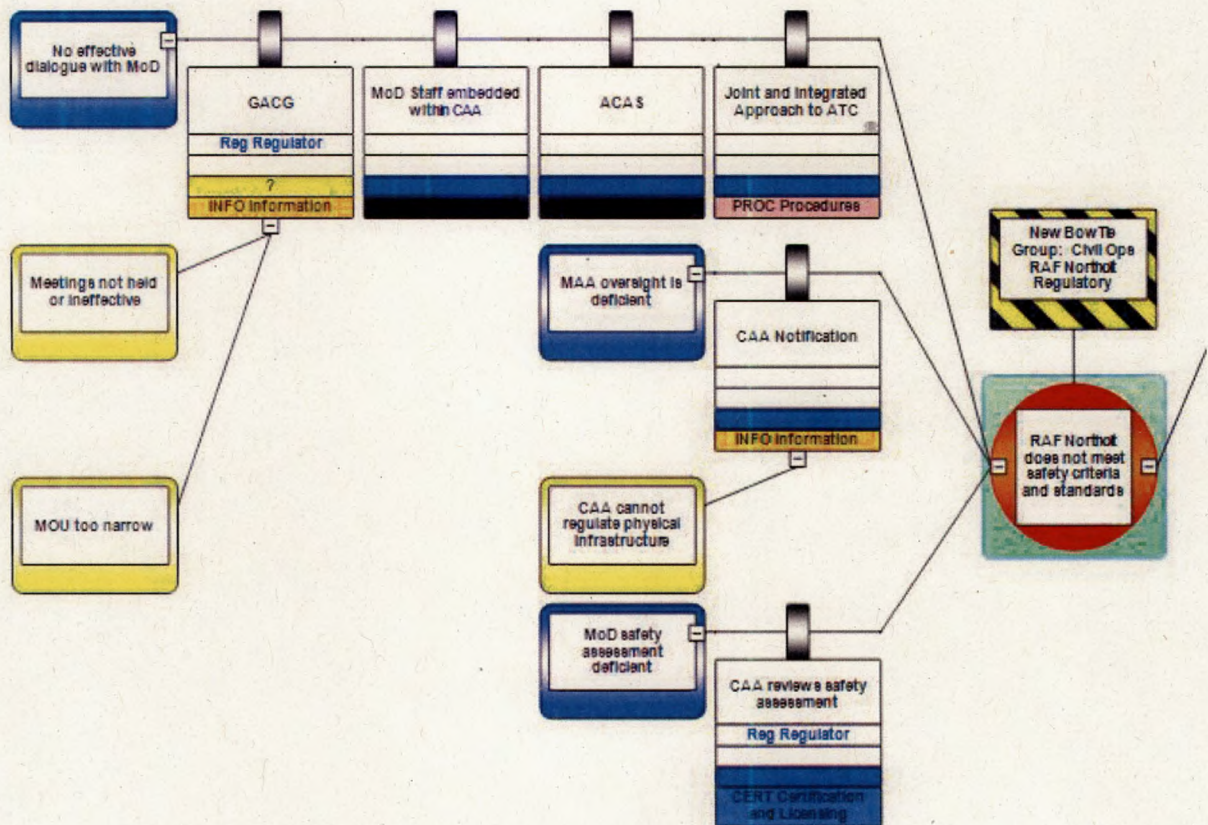
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Regulatory Bow Tie for RAF Northolt



16. The left hand side of the bow tie was then expanded to look at the threats particularly the ineffective dialogue with the MoD.

Expansion of Regulatory Bow Tie for RAF Northolt showing threats



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17. This bow tie then exposed the fact that the GACG was the first line of defence in mitigating any risk to operators and it then led the review to focus on this area and the requirements and effectiveness of notification. There was evidence that the GACG has been less than effective due to a number of factors.
- a. The low frequency of meeting.
 - b. The restricted scope of the meetings (ICAO Annex 14 only).
 - c. The lack of any formal pre and post meetings with FOPS and ATM.
 - d. The lack of notification through this process of RAF Northolt closure in 2018.
 - e. The group not being to ascertain at the January 2017 meeting the status of the EMALS replacement project.
 - f. The significant number of Government Aerodromes within the MoU without any entry in the civil AIP.

Annex 3

Table of Recommendations

Number	Areas of Focus	Recommendation
2017/01	GACG - The clarity and availability of information provided by the MAA/MoD to the CAA, through the GACG that enables the CAA to come to a conclusion on assurance.	The CAA involvement with the GACG should be bolstered to include ATM, FOPS and International Strategy and Engagement (ISE) of the International Directorate (ID). This may take the form of actual attendance or a pre-meet where risks can be discussed. Consideration should be given to the need for DfT involvement ⁴² .
2017/02	GACG - The clarity and availability of information provided by the MAA/MoD to the CAA, through the GACG that enables the CAA to come to a conclusion on assurance.	The MAA should be asked to ensure that suitably qualified and informed representation be provided at the GACG. (This might mean representation from the front line commands). This may take the form of actual attendance or a pre-meet where risks can be discussed.
2017/03	GACG - The clarity and availability of information provided by the MAA/MoD to the CAA, through the GACG that enables the CAA to come to a conclusion on assurance.	The GACG MoU be reviewed to determine its appropriate scope over and above just ICAO Annex 14.
2017/04	GACG - The clarity and availability of information provided by the MAA/MoD to the CAA, through the GACG that enables the CAA to come to a conclusion on assurance.	A formal CAA internal process should be established to ensure that any information, including occurrence reports is shared amongst other SARG teams and a formal record made of any decision or conclusion made after validation of that information.

⁴² Particularly when considering the need for the DfT to be assured of an equivalent level of safety from the MoD.

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	Oversight - The effectiveness of the CAA's oversight of AOC holders using Government aerodromes.	
2017/05	GACG - The clarity and availability of information provided by the MAA/MoD to the CAA, through the GACG that enables the CAA to come to a conclusion on assurance.	An individual within the CAA should be nominated as accountable for the processing and validation of information received from the MAA/MoD.
2017/06	Aeronautical Information - The clarity, quality and availability of data provided to AOCs using Government Aerodromes, through the normal civil system of notification.	The MoD and DfT should determine if all Government Aerodromes should be included or removed from the civil AIP
2017/07	Aeronautical Information - The clarity, quality and availability of data provided to AOCs using Government Aerodromes, through the normal civil system of notification.	A review should be made of the RAF Northolt AIP entry and edits made to ensure it matches the standard required of other Licensed UK aerodromes, including the provision of an aerodrome chart, an obstacle chart and Instrument approach procedure charts.
2017/08	GACG - The clarity and availability of information provided by the MAA/MoD to the CAA, through the GACG that enables the CAA to come to a conclusion on assurance. Aeronautical Information - The clarity, quality and availability of data provided to AOCs using Government Aerodromes, through the normal civil system of notification.	Subject to recommendation 2071/01 The GACG re-invigorates the process for ensuring that as a minimum, tranche 1 of the Government Aerodrome list (as detailed in the MoU) are included in the civil AIP. (RAF Brize Norton, RAF Valley, RNAS Yeovilton)

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2017/09	ICAO Differences - The differences with ICAO SARPS that may or may not be notified by the MoD.	The MAA, MoD ⁴³ , DfT and the CAA should work together to resolve the problem of notifying military and civil differences to ICAO in pursuit of the successful closing of the corrective action plan. (AIP GEN 1.7)
2017/10	ICAO Differences - The differences with ICAO SARPS that may or may not be notified by the MoD.	Any differences from ICAO for aerodromes available for civil use, should be clearly annotated in the UK Civil AIP. (individual aerodrome entries)
2017/11	Oversight - The effectiveness of the CAA's oversight of AOC holders using Government aerodromes	The MAA should consider if the wording in Regulatory Article 3219 should be more explicit.
2017/12	Peer Review - The opportunity for a peer review of the MAA's oversight processes.	The CAA should accept the MAA invitation to witness their next audits of RAF Northolt and RAF Unit Swanwick.
2017/13	Oversight - The effectiveness of the CAA's oversight of AOC holders using Government aerodromes.	The CAA should ascertain what MoD's plans are for the inclusion of EMAS at RAF Northolt.
2017/14	Oversight - The effectiveness of the CAA's oversight of AOC holders using Government aerodromes.	The MoD consider implementing RNP APCH for runway 07 at RAF Northolt.
2017/15	Oversight - The effectiveness of the CAA's oversight of AOC holders using Government aerodromes.	The MoD to confirm that controllers involved in providing ATM services to civil aircraft operating into RAF Northolt (and other Government Aerodromes) are aware of the importance of stabilised approaches and have received appropriate training.

⁴³ To mean front line commands, Navy Command, Joint Helicopter Command and Air Command

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2017/16	Oversight - The effectiveness of the CAA's oversight of AOC holders using Government aerodromes.	The MAA, CAA and MoD set up a formal project to identify issues with standardisation of procedures and phraseology for the varied circumstances faced by both civil and military controllers.
2017/17	Oversight - The effectiveness of the CAA's oversight of AOC holders using Government aerodromes	The CAA should impose a condition that when there is a tailwind component at RAF Northolt, noise abatement procedures are suspended. EGWU AD 2.21 (a) should be amended accordingly.

Annex 4

References, Evidence and Material Evaluated:

1. Review of the safety assessment conducted by MoD on the Lytag Arrestor beds dated 23 January 2015.
2. Cranfield University Independent Safety Assurance review of the CAA Phase 1 report. 12 January 2017.
3. Independent peer review of the documentation by [REDACTED]. Undated.
4. Letter from Biggin Hill to DSARG dated 8 July 2015.
5. Judgment of Hon. Mr Justice Popplewell dated 23 January 2015 and supporting statements. Case No: CO/12787/2013 dated 23 Jan 15 at the Royal Courts of Justice.
6. MoU between the CAA and MAA regarding the safety regulation oversight of Civil Aviation activity at Government Aerodromes dated 17 Nov and 16 Dec 2015.
7. Defence Aerodrome Manual RAF Northolt Edition 1.7 effective 29 Jul 2016.
8. UKAIP entry for RAF Northolt effective 15 September 2016.
9. United Kingdom Airprox Board report 2014170.
10. AAIB report 5/94 on the accident to Cessna 550 Citation II G-JETB at Southampton Airport on 26 May 1993.
11. AAIB report 3/97 on the accident to gates Learjet 25B EC-CKR at RAF Northolt on 13 August 1996.
12. AAIB report 12/2016 on accident to Embraer EMB-505 Phenom 300, HZ-IBN, Blackbushe Airport 31 July 2015.
13. All CAA held MOR data for RAF Northolt between the years 2014-2017.
14. ICAO C/CAR DCA/9-IP/07 Runway Safety Area Improvements in the United States.
15. DOT/FAA/PM-87-27 report into Soft Ground Arresting Systems [REDACTED] August 1987.
16. DOT/FAA/CT-93/80 soft ground arresting systems for airports [REDACTED] and [REDACTED] [REDACTED] December 1993.
17. European Action Plan for the Prevention of Runway Excursions.
18. Jeppesen airport information for EGWU printed on 22 Feb 2017

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19. ICAO Annex 14 Volume 1.
20. ICAO Annex 15
21. Single European Sky regulations of 2004 as amended.
22. Regulation (EC) No 216/2008 of 20/02/2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/E
23. Commission Regulation (EU) 2017/363 of 1 March 2017 amending Regulation (EU) No 965/2012 as regards the specific approval of single-engined turbine aeroplane operations at night or in instrument meteorological conditions and the approval requirements for the dangerous goods training relating to commercial specialised operations, non-commercial operations of complex motor-powered aircraft and non-commercial specialised operations of complex motor-powered aircraft.
24. COMMISSION REGULATION (EU) No 139/2014 of 12 February 2014 laying down requirements and administrative procedures related to aerodromes pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council.
25. Annex to ED Decision 2014/013/R Certification Specifications (CS) and Guidance Material (GM) for Aerodromes Design CS-ADR-DSN
26. UK Air Navigation Order 2016 specifically Part 5 and Part 8 Chapter 1.
27. Manual of Air Traffic Services Part 2 Swanwick Chapter 6 Northolt and Denham Procedures published 09 Dec 2016 – Commercial in Confidence.
28. ICAO PBN Manual (Doc 9613).
29. ICAO Assembly Resolution A37-11 Performance Based Navigation global goals.
30. EASA NPA 2015-01 Performance Based Navigation.
31. TAG Aviation pilot's guidance for RAF Northolt.
32. Eurocontrol Study on Existing Legislation, Regulation, Procedures and Practices across ECAC and Relevant Non-ECAC States in the Joint Civil-Military use of Military Aerodromes