TAG Farnborough Airport Ltd

Town and Country Planning Act Section 106/299A

Performance Monitoring Report.

Clause 10a of the Town and Country Planning Act Section 106/299A Agreement, between TAG Farnborough Airport Ltd and Rushmoor Borough Council, in respect of Planning Consent Reference 99/00658/OUT states:

"Within 6 weeks of the end of each calendar year, the Company shall submit to the Council a performance monitoring report detailing the performance of the Company against the objectives set out in this agreement, in a manner to be agreed with the Council."

TAG Farnborough Airport hereby submits this report summarising the Airport's performance against the requirements laid out in the Section 106/299A agreement in compliance with the requirements of clause 10 of that agreement. Every clause of the section 106/299A Agreement is taken in turn and any performance information relative to 2006 supplied.

Aircraft Movement Records

Clause:

1a Detailed records are maintained of every aircraft movement that takes place at the airport. Details stored include:
Time and date of the movement, Movement type (Arrival, or Departure) callsign, departure airport (if applicable) destination airport, aircraft registration, movement type, and aircraft type, Maximum take-off weight, aircraft ICAO Chapter, and runway used.

1b A Personal Computer linked to both the agreed recording system (the Brüel and Kjær Noise and Track Monitoring System (NTMS)) and to Rushmoor Offices is provided for use by Rushmoor Council Officers.

1c Quarterly reports summarising the data required by clauses 2r, and 2s, have been submitted to Rushmoor each within 4 weeks of the end of each quarter (as required). Reports are supplied in both electronic and paper format.

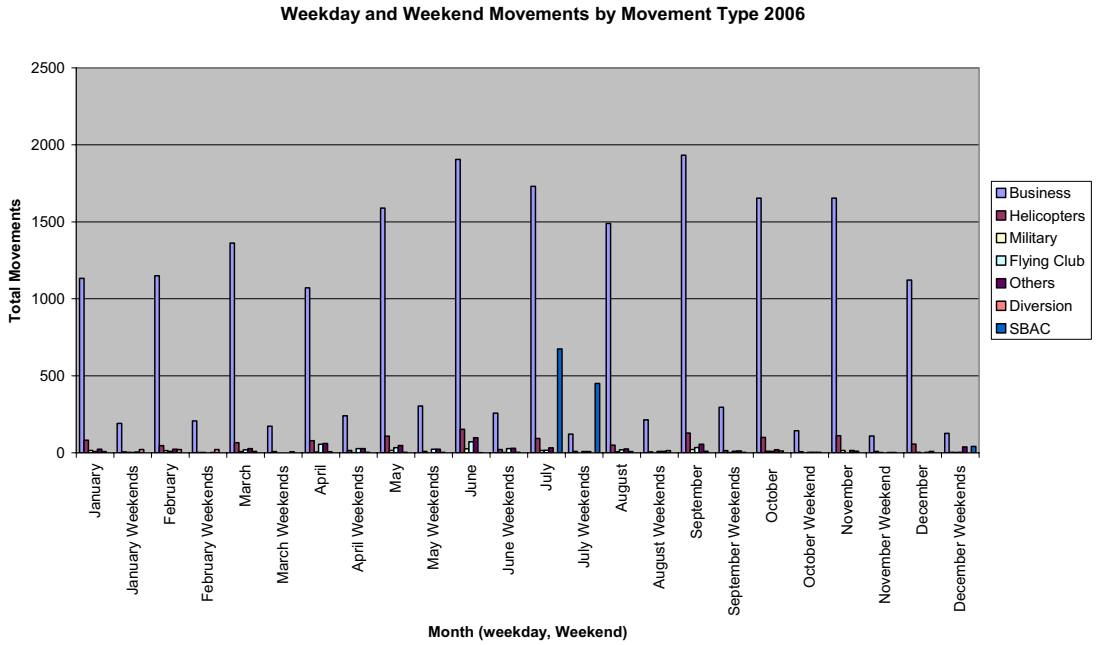

Figure 1: 2006 Movements by Movement type

Noise Control

2a Airport based Air Traffic Controllers act on TAG's behalf controlling TAG traffic so as to keep within the required annual noise budget, defined by the position of and total land within the 55dB(A) and 60dB(A) LA eq (16hr) contours.

2b During 2006, the airport has again operated successfully within the contours referenced above. The Company has therefore not sought any alternative noise budget areas.

The planning consent granted by Rushmoor referred to Figure 8 of the technical report from Acoustic Technology Ltd, Number AT 4769/1 rev 0 contour areas, as the controlling areas, in the Section 106/299A Agreement.

LEq dB (A)	1997 Contours (Km^2)	Predicted 20,000 movements (1997 mix)
55	6.43	9.07
60	2.77	4.03
65	1.24	1.70

Table 1: Control contour areas as specified in 99/00658/OUT

LA Eq (16hr) dB (A)	**July – September 2003 (Km2)**	**January – June 2004 (Km2)**	**January – December 2004**	**January – June 2005**	**January – December 2005**	**January –June 2006**	**January – December 2006**
55	3.11	3.77	3.62	3.61	3.62	4.10	4.87
60	1.4	1.64	1.56	1.56	1.57	1.70	1.98
65	0.8	0.87	0.84	0.88	0.88	0.94	1.02

Table 2: Farnborough's INM Contour areas, 2003 to date

2c All references to aircraft noise and noise controls within the existing planning consent are based on the noise metric of $L_A Eq_{16hr}$. The NTMS records L_A Eq $_{16hr}$, SEL, and EPNL for each individual aircraft noise event. All values are expressed as dB $_{(A)}$. All values are calculated from recorded aircraft derived noise and exclude (as far as possible) background noise recorded. As is evident from table 3 below the calculated EPNdBs for aircraft operating at Farnborough fall well below the local plan policy limit of 98.9 EPNdB

Aircraft Type	Average EPNdB
B462	85.1
BE20	83.3
C56X	84.6
C550	77.4
CL60	85.4
F900	84.8
GLF5	81.5
H25B	88.8
LJ45	85.5
PRM1	81.3

Table 3: Average EPNdB levels for top 10 aircraft by type, using Farnborough in 2006.

2d Standard operating procedures at the airport are continually reviewed to achieve a reduction in the noise impact of flying. The airport monitors all aircraft routes and noise using a Noise and Track Monitoring System (NTMS). The Federal Aviation Authorities' Integrated Noise Model (INM) is used twice yearly to produce noise contours based on actual aircraft fleet mix and imported radar tracks from aircraft using the airport. TAG will have been operating under the terms of the planning consent granted (and CAA License) for 5 years at the end of 2007, when the first review of the noise contours is due to take place.

2e Use of reverse thrust by pilots on landing aircraft is a procedure required by many operators' flight manuals as a safety aid. It would not be appropriate for TAG to dictate guidelines for the use of reverse thrust, as its use is entirely dependant on flight conditions. TAG Paragraph (f) of AD 2-EGLF-1-9 of the UK AIP that refers to Farnborough, reads:-

"*To minimise disturbance in areas adjacent to the aerodrome, commanders of aircraft are requested to avoid the use of reverse thrust at all times, consistent with the safe operation of the aircraft. Where the use of reverse thrust is essential, the use of idle reverse thrust should be used in preference."*

Use of reverse thrust is monitored by NATS on behalf of TAG.

2f TAG banned entry to the airport by ICAO Chapter 2 aircraft in January 2001. The ATP, 748 Jetstream aircraft has also been phased out and is no longer permitted to use the airport.

All aircraft using the airport are certified ICAO noise Chapter 3 compliant, or have been subject to hush kitting to ensure compliance. A recent study carried out at the airport has indicated that certificated noise levels for the majority of aircraft currently using the facility comply with the latest required manufacturing standard: ICAO Chapter 4.

2g Details of preferred noise routes submitted to and agreed by, Rushmoor Borough Council in compliance with this clause of the agreement. The preferred noise routes in use have been accepted by the CAA and are published in the UK Air Pilot (UK AIP) as required. All entries in the UK Air Pilot are regularly transferred and included in updates of the comparable US Flight information publication "Jeppersons". The Brüel and Kjær Noise and Track Monitoring System (NTMS) installed records full details (including speed altitude and location for all radar information points) of all aircraft radar tracks in the Farnborough radar zone. All track information is stored for future reference.

2h All Farnborough aircraft's radar tracks are checked individually using the Noise and Track monitoring system for compliance with published procedures. A staged infringement procedure has been successfully implemented to address aircraft who fail to abide by the requirements of the noise preferential routes without the consent of Air Traffic Control. Operators respond to issues of non compliance through confirmation of completion of additional flight staff briefings together on occasion with slight amendments (if required) to their standard operating procedures for Farnborough. All outstanding responses from operators are actively being sought.

Period	Total Infringements	Total Responses Accepted.
January to March	5	5
April to June	11	11
June to November	26	17
December	2	1

Table 4: Noise abatement Infringements pursued

2i Aircraft ground operations are monitored by Air Traffic Control. A dedicated engine ground running point has been established at the furthest distance from the boundary of the airport. Essential engine ground running only is permitted at weekends and public holidays, and is restricted to the hours of 09:00 and 20:00. 4 silent fixed electrical Ground Power Units (GPU's) have been installed by TAG, to reduce the requirement for aircraft to operate their Auxiliary Power Units (APU's). In order to encourage use of the units temporary buildings were removed from the area improving their accessibility. Just 5% of complaints received this year referred to ground noise

The reduction of the potential for disturbance is a primary consideration in all areas of airport ground operations.

2j Ground running of engines is only permitted to take place between the hours of 08:00 and 20:00 Monday to Friday (one hour later in summer) excluding public holidays. Prior permission for aircraft engine start-up is required from the duty air traffic controller. Engine testing is again controlled and is only permitted at the authorised Engine Ground Running Bay (see 2i)

2k Auxiliary Power Units (APU's) are not permitted to be operated between 22:30 and 06:30.

2l Whenever possible parking aircraft within the area shown on the plan: TOR 158901/SK7129/8/2000 is avoided. On the odd occasion aircraft are parked in this area they are positioned such that their intakes face away from nearby residential properties. Aircraft within this area will use Ground Power Units whenever possible.

2m All TAG helicopter pilots are required to operate in accordance with minimum noise procedures, as agreed by Rushmoor.

2n No residential, academic or health care properties have been found to lie within the 60dB (A) L_A Eq (16 Hour Annual average) contour. The 60dB (A) L_A Eq (16Hour Annual) Average) noise contour lies within the airport boundary.

2o The INM model has been prepared and run 6 times in total since the completion date, at the intervals prescribed by clauses a – e of paragraph 2o of the agreement. The results of all modelling exercises have been supplied to Rushmoor. Results of the latest modelling exercise (based on the calendar year 2006 operations) have been submitted to Rushmoor in early February 2007.

2p Noise event data is recorded by the three noise monitoring terminals continuously and noise events correlated with TAG aircraft wherever appropriate. The third (portable) noise monitor is being used to undertake noise monitoring in areas where noise is a concern to local residents. The various locations used for this monitor over 2006 have been provided as part of the quarterly monitoring submission.

2q Appended to this report, (Appendix A) is the response received from the CAA following advice being sought on the need for a further audit of the noise modelling methodology. As can be seen, the CAA see no reason for the audit of the modelling methodology to be repeated at this time. Also attached is a copy of their original audit report.

2r A dedicated PC and real time access to the noise and track monitoring system has been provided for the benefit of Rushmoor Council officers. Quarterly summaries of information as recorded by the noise and track monitoring system, together with details of movements are routinely provided to Rushmoor within 4 weeks of the end of each quarter.

2s In line with the requirements four quarterly monitoring, reports have been provided to Rushmoor covering the four quarters of 2006.

2t The noise monitoring regime has remained unaltered since the system was reviewed in conjunction with Rushmoor in January 2005. In Rushmoor's response to this consultation they confirmed their acceptance of the continued use of the system in its existing format (i.e. 2 permanent 1 portable monitor).

Air Quality

3a 13 Air quality monitoring locations have been equipped with passive Nitrogen oxide monitoring apparatus. (Nitrogen oxides are widely accepted and agreed to be the most appropriate indicator pollutants for aircraft) Two monitoring sites have active sampling devices collocated with passive diffusion tubes. The combined data from these sites is collected, regularly and results published in TAG's quarterly submission to Rushmoor.

3b The extent and scope of the air quality monitoring regime was considered as a central element of the review carried out in early 2005. Rushmoor confirmed their acceptance of the existing monitoring regime (as detailed above).

3c Full details of air quality monitoring results are included in the quarterly reports submitted to Rushmoor.

Aircraft Weight

4a In 2006 a total of 317 (just over 4% of the total) Business Aviation Aircraft with maximum take-off weights (MTOW) in excess of 50t used the airport at Farnborough. This figure represents a decrease of over 20% compared with last year.

4b No Business Aviation Aircraft with a MTOW in excess of 80 tonnes has used the airport over 2006. Farnborough International 2006 involved use of the airport by aircraft not compliant with the Section 106 agreement; however these movements formed part of the International Airshow and are specifically excluded from the requirements of the Section 106 controls. A total of 1126 movements took place by airshow aircraft this year.

Freight

5a No aircraft is permitted to carry more than a total of 100k freight into or out of the airport, except race horses.

5b A total of 100 movements are permitted under the Section 106 agreement, by aircraft carrying racehorses. In 2006, 41 involving the transportation of racehorses took place.

Safety

6a TAG continues to endeavour to improve levels of third party risk associated with the airport, through the use of external contractors recognised as leaders in the field of third party risk modelling to undertake annual reviews of third party risk associated with the airport's operations. Results of all of the modelling exercises undertaken to date have shown TAG's operations to remain well within the limits as set through the planning process for the airport.

6b Planning Consent 99/00658/OUT includes details of risk contours with which all operations must comply. All movements in 2006 when modelled produce a contour that lies within those stipulated in the Section 106/299A agreement. ESR Ltd (formerly part of AEA Technology) have undertaken an audit of the airports activity in terms of its associated third party risk. A summary of the results of this audit are attached to this report as Appendix B.

Community benefits and environmental improvements

7a A detailed management plan was submitted in 2003 that includes measures to conserve the part of Eelmoor Marsh SSSI located within the airport, the area designated by the council as a Site of Nature Conservation Interest within the aerodrome boundary and has to date successfully translocated 3 areas of species rich grassland as defined in the original Environmental Statement accompanying the planning submission.

7b Over the course of 2006 a total of 20 students have undertaken work experience placements at the airport.

7c TAG have provided a total of £43,481 funding to Rushmoor Borough Council for community environmental projects. This value reflects contributions levied at an agreed rate of £2 per aircraft movement, and £5 per aircraft movement if the aircraft has a Maximum Take Off Weight of over 50t.

Aerodrome Safeguarding

8a An airport safeguarding map was deposited with Rushmoor in December 2003 the status of this submission that was accepted by Rushmoor remains valid.

Complaints

9a A record of all complaints received by TAG is maintained details recorded include the name address and contact details of the complainant and detail of the complaint, regarding noise, air quality, odour, track keeping, and alleged vortex damage. Records are also maintained of TAG's response to any such complaints received.

Month	Total Complaints	Complaints relating to non compliant flights
January	15	3
February	21	1
March	13	3
April	17	1
May	29	6
June	50	4
July	43	3
August	26	3
September	40	11
October	36	9
November	22	4
December	15	2
Total	**329**	**50**

9b 12 reports detailing all complaints received have been forwarded to Rushmoor over the course of 2006. All reports have been received within 1 week of the end of each month period.

Performance Monitoring of the Section 106 Agreement

10a TAG hereby submits this report as a performance monitoring report for consideration under the terms of clause 10a.

Appendix A

Directorate of Airspace Policy
Environmental Research and Consultancy Department

Civil Aviation Authority

Kathy Wood
Environment Manager
TAG Farnborough Airport Ltd
Farnborough Airport
Hampshire
GU14 6XA

24 September 2004

Ref 4ER/3/35

Dear Kathy

Quality Assurance Checking of INM Input Data and Contours

Further to our revised work proposal of 7 September 2004, please find below the results of our checks on the inputs to your INM contours.

Results of verification tasks

Our checks have been based on your data CD entitled "INM 6.1 Noise Contours for CAA Review" – this contained files for 4 months, Sep-Dec 2003. The following tasks have been performed to verify the modelling process:

Verification of INM substitutions

We have looked through the list of Farnborough aircraft types and your proposed INM substitutions, the majority of which appear perfectly reasonable and valid. We do have the following comments to make on some types (excluding helicopters), which you may wish to consider:

Code	INM Code used by TAG Farnborough	Comment
B35	GASEPV	Use DHC6 (Beech 350 is twin-engined)
B350	GASEPV	Use DHC6 (Beech 350 is twin-engined)
CVLT	SN600	Use CVR580 (Convair CV-580)
T43	None	This could be an AT43 (ATR42-300)

Verification of flight tracks/traffic

You have employed individual flight tracks for both departures and arrivals based on radar data extracted from your B&K NTK system. We have already provided you with a program *farntrac.exe* to 'clean up' the radar tracks and an Excel macro to enable you to view individual flight tracks.

The individual flight tracks have been checked by inspection and all appear to be correctly assigned to the appropriate runway, etc. We have noted also the small 'blip' on the outer

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contour for November 2003 and agree that an acceptable solution would be to manually smooth it in a GIS package once the contours have been exported.

Verification of flight profiles

We have checked that the flight profiles and stage lengths chosen are suitable for the aircraft that operate at Farnborough. As modelled, the vast majority of them are Stage Length 1; the remainder (mostly Boeing 737-800s and a few other types) have longer stage lengths assigned. For future runs, you may wish to investigate whether any aircraft engage in fuel 'tankering', which could mean that longer stage lengths may be more appropriate.

Verification of other input modelling assumptions

We have inspected your INM input files to make sure that all other modelling assumptions are appropriate. The 'Refinement' and 'Tolerance' values used in the INM Run Options appear reasonable. However, we note that inconsistent Low and High Cutoff values have been used for each month (i.e. Sep - 55/85, Oct - 50/75, Nov - 55/75, Dec - 50/70). We would recommend using consistent values across all months. As good practice, we would also recommend the use of a Low Cutoff value that is lower than the minimum contour value to be plotted (e.g. use a Low Cutoff value of 50 if plotting at 55 and above).

Verification of final contours

The final contours appear reasonable and in accordance with the modelling input data used.

As requested, we have also checked your predictive contours for Jan-Jun 2004 that were attached in Simon Greener's e-mail of 6 September 2004. These were derived by assuming a correction of 10log1.2 = 0.79181 dB to account for a 20% increase in traffic. Strictly speaking, this correction only holds true if there are no changes to the traffic mix and east-west runway usage between the periods considered. If there are no significant changes to the traffic mix/runway usage, we would consider this simple correction to be reasonable. However, any significant changes to the traffic mix (especially with respect to the noise dominant types at Farnborough) and runway usage would require re-modelling to ensure that the predicted contours are reliable.

Conclusions

Based on our checks of your INM input data for Sep-Dec 2003 and the contours produced, we are satisfied that the modelling process has been carried out appropriately. We have made some recommendations for your consideration, although in practice these are not expected to have any significant effects on the final contours.

We have also checked the predictive contours for Jan-Jun 2004. The 0.79 dB correction you have employed is appropriate if there are no significant changes to the traffic mix and runway usage.

Yours sincerely

Joseph Lee

Directorate of Airspace Policy
Environmental Research and Consultancy Department

Civil Aviation Authority

Kathy Wood
Environmental Manager
TAG Farnborough Airport Ltd
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29 January 2007
Ref 4ER/3/35

Dear Kathy,

TAG Farnborough Airport Ltd: Modelling Check INM Input Methodology

Thank you for your letter dated 4th January regarding auditing of INM input data, following ERCD's full audit undertaken in 2004.

Your letter states that you have continued to obtain radar data to update the flight tracks used as an input to the noise calculation process for each set of contours produced since the audit. You have also continued to follow our audit recommendations, particularly regarding the INM grid calculation parameters (grid refinement and tolerance). You further indicate that you have adopted the latest version of the INM - Version 6.2. This brings INM a step closer to the latest international guidance, pending the release of INM 7.0. The move to INM 6.2 also provides new aircraft type data for a number of the dominant aircraft types at Farnborough and would have been a recommendation of any audit.

Based on your letter and our brief telephone discussions, I see no reason why a second full audit is necessary at this time.

I have been working closely with the FAA on future aircraft noise modelling guidance. This has been incorporated into the latest version of ANCON (v2.3) and will be implemented in INM 7.0. I would therefore recommend that you transition to version 7.0 as soon as it becomes available (current understanding is that it will be released in early 2007). In addition INM 7.0 should also provide additional data for new aircraft types.

The input process for INM 7.0 is essentially identical to earlier versions so my initial thoughts are that a full audit would not be required. However, I would like to reserve the right to reconsider this, pending final release of the software.

Yours sincerely

D. P. Rhodes.

Dr Darren P Rhodes
Project Manager Noise Modelling

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Appendix B

ESR Technology
Engineering, Safety & Risk

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Aviation

Kathy Wood
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2nd February 2007
Our Reference: D1000326

Dear Kathy

Farnborough Airport 2006 Annual Third Party Risk Audit Findings

Further to your recent request, I provide the findings of the Audit of Third Party Risk at Farnborough Airport in 2006, undertaken by ESR Technology. The context in which the audit has been undertaken is that, under the terms of the planning consent granted for civil aircraft operations at Farnborough Airport, specific conditions apply in respect of third party risk. Conditions 16 & 17 require that operations must maintain third party risk with defined limits, as characterised by the agreed 1 in 10,000 and 1 in 100,000 per annum individual risk contours, determined by use of an appropriate third party risk model. It is a further requirement that compliance with these conditions be demonstrated on an on-going basis.

Demonstration of compliance is achieved by monitoring of operations within a calendar year to gather operational data in respect of key parameters that determine the level of third party risk, as follows:

- the annual number of fixed wing aircraft movements;
- the weight of the aircraft that undertake those movements;
- the split of runway utilisation between Runway 06 and Runway 24 operations.

The risks for actual operations can then be determined and compared with those corresponding with the agreed contours. ESR Technology has determined the third party risk by using the NATS Third Party Risk Model, as previously employed to determine the agreed risk contours with which operations will apply. The third party risk was determined for operations in accordance with operational data supplied by TAG Farnborough Airport.

According to data gathered by TAG Farnborough Airport, the operations for 2006 are characterised as follows:

Movement numbers
24,455 movements in total.
23,077 fixed wing aircraft movements.
1,378 helicopter movements.

Runway Utilisation
Runway 06 Departure: 10.6%
Runway 06 Arrival: 11.9%
Runway 24 Departure: 39.7%
Runway 24 Arrival: 37.9%

Aircraft weight
Movement weighted average weight: 15.9 tonnes
Associated area destroyed in the event of aircraft crash: 0.19 hectares.

The primary parameters that determine the estimated level of risk are the number of movements and the aircraft weight. The annual number of movements in 2006 was appreciably lower than that assumed for the determination of the agreed contour (28,000 movements per annum). The average aircraft weight and associated area destroyed on the ground for 2006 operations are also lower than those assumed for the determination of the agreed contour (24.37 tonnes, 0.24 hectares). Since the level of risk at any location is directly proportional to both of these factors, on the basis of this operational data, it can readily be shown that the 2006 operations comply with the planning conditions.

Whereas, in principle, the estimated risk level may vary with a change in runway utilisation, this effect is found to be minor. The actual runway utilisation in 2006 is found not to be significantly different from that assumed in determining the agreed contours (15% Runway 06 Departure and Runway 06 Arrival and 35% Runway 24 Departure and Runway 24 Arrival).

In summary, the operations for 2006, as characterised by the above operational data, have been assessed by means of the risk modelling approach described above, to determine the level of risk associated with them, and have been found to comply with the necessary planning conditions. That is to say, the 1 in 10,000 and 1 in 100, 000 per annum risk contours on the North-East and South-West ends of the runway, determined for 2006 operations, are found to lie within the agreed risk contours.

Yours sincerely

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