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# THE REVIEW OF THE MOD'S COMPENSATION ARRANGEMENTS NEAR MILITARY AIRFIELDS

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## INTRODUCTION

1. Within any local community the level of tolerance of aircraft noise from airfields depends on many factors. Some of these are obvious, such as the noise level itself; peculiarities of pitch or frequency; operating practices (including times of operation). Others are more difficult to define, such as social expectations of what is an appropriate environmental living standard; local economic considerations; employment levels and types; and arrangements which are made, if any, to compensate for or alleviate the noise nuisance in the community.

2. This paper surveys the specific problem of compensation for noise nuisance near Military Airfields, and outlines the two year review which the Ministry of Defence undertook, between 1983 and 1985. This paper will comment on a number of problem areas related to the setting of a fair policy for compensation and alleviation of noise for the householder; will state the policy of changes resulting from the review: and will attempt to estimate the effect of these for the future.

## BACKGROUND

3. It is important first to understand the background to the review. For historical and legal reasons, military and civil airfields are treated differently. Major civil airports have progressively, since the late 1960s, introduced, with statutory backing, schemes to provide grants for sound insulation of homes to those living in the vicinity who were affected by high noise levels. By 1981 nine major civil airports had schemes, and generally homes within the 50 NNI contour qualified for a grant (in some cases 100%) for acoustic double glazing of most rooms. By contrast, the policy for military airfields was to introduce sound insulation grant schemes only at airfields where major new public works had taken place resulting in increased noise levels and homes were subject to a higher qualifying noise level (75 dB $L_{Aeq, 12Hr}$, roughly equating to 55NNI). By 1981 only one military airfield and 3 Helicopter Landing Sites had a scheme. Not surprisingly, therefore, levels of complaint increased, and in particular there was a call from local authorities for the anomoly in treatment of people living near civil and military airfields to be removed. After all, noise was, level for level, equally annoying whether civil or military aircraft were the cause.

4. As a result, a review of the compensation arrangments near military airfields was set up in 1983. The review covered many problem areas, and I will describe the main ones briefly here.

THE REVIEW OF THE MOD'S COMPENSATION ARRANGEMENTS NEAR MILITARY AIRFIELDS

## NOISE MEASUREMENT TECHNIQUES AND METHODOLOGY

5. I have noted already that the different noise indices were in use. Civil airport noise was measured by reference to the Noise and Number Index; military airfield noise by the equivalent continuous sound level method. As part of the review, therefore, the National Physical Laboratory was invited to consider the most appropriate method to measure environmental noise due to military aviation. Their report [1] made a study of literature on public reaction to aircraft noise, the latest international developments in the area, the physical relationship between the various noise measures in use, and the current state of knowledge on the noise dose/response relationship. In particular, it examined the relation between NNI and $L_{Aeq}$. It concluded that, although there is good correlation, the noise levels occurring in close proximity to many military airfields are considerably higher than any for which NNI has been validated, and strong support emerges for continued use of the $L_{Aeq}$ method. In considering this conclusion, the review also noted that the $L_{Aeq}$ system generally is better able than NNI to reflect the wide variation in noise peaks and irregular movements at military airfields. The review therefore recommended the continuing use of the $L_{Aeq}$ method for evaluating noise around Military Airfields.

6. It is interesting to note that since then the EEC have also recommended the use of the $L_{Aeq}$ index for monitoring noise around airfields; and following this the Government has issued a consultative document seeking views on whether the use of NNI in relation to civil airfields should continue.

7. As a separate issue, the review looked at methods for producing contours, particularly computer modelling techniques. This subject is dealt with in detail in anther paper [2], and it was concluded that the aim should be to improve the sophistication of the AIRNOISE suite of computer programs so that all relevant variables can be included. Work on this continues, meanwhile noise surveys must continue to be based on initial prediction by computer, validated by specific field measurements; a practice which is labour intensive and time consuming.

## QUALIFYING LEVELS FOR GOVERNMENT ASSISTANCE

8. The review re-examined the recommended external noise levels at which assistance is offered by way of sound insulation grants and by way of purchase of houses. At the highest noise levels we first determined the level above which there is the potential to damage hearing. We accepted the view [3] that even a brief exposure to noise levels of 125 dB(A) or higher had such potential. At levels just below that, it is unlikely that significant hearing damage would occur from occasional but regular exposures, although we recognised that residents would suffer a substantial deteriation in their quality of life. In recognition of these, two conclusions emerged:

a. Dwellings exposed to any maximum sound level in excess of 125 dBA should be purchased, by use of compulsory powers if necessary.

B. Dwellings exposed to maximum sound levels of between 117 and 125 dBA on a recurring basis (or equivalent 12 hour average sound level of 83 dBA or more) should be purchased if owners or occupiers wished, but no compulsory purchase should be exercised.

9. Turning to grant assistance for sound insulation, we found that there was no reason to think that military aircraft noise was less intrusive than that from civil aircraft, and that as a principle it was fair to make broadly similar arrangements for people living near either type of airfield, with qualifying noise limits set having regard for the annoyance caused to residents. Subjective annoyance research (eg References [4] and [5]) was used as the basis for deciding the scope of civil airport schemes, and we felt, in the absence of detailed appraisals of subjective reaction around military airfields which would be expensive to conduct, similar qualifying levels should be set. The main civil schemes in operation had since 1981 adopted 50 NNI as the threshold, and the best equivalent in terms of 'A' weighted 12 hour average sound levels is 70 dBA [6]. We therefore concluded that sound insulation grants should be offered to those who are exposed to this level of noise.

10. There was, however, an important rider to this relating to night time noise levels. Although our practice has been and still is to include all aircraft movements for a full 24 hour period in calculating the 12 hour $L_{Aeq}$, which weights the results to give recognition to added annoyance which it is claimed night time noise causes; we took note of research [7] which suggested that regular disturbance of sleep is particularly disturbing. We therefore concluded that, at airfields where more than 20 movements regularly take place between 2200 hrs and 0600 hrs, the qualifying noise contour should be extended to include additionally those houses subject to maximum levels of 82 dBA.

## NOISE LEVELS NEAR MILITARY AIRFIELDS

11. A major part of our research was devoted to an estimate of noise levels at all military airfields. We used our computer modelling technique, and, although at this stage of development, it could only take account of the variety of aircraft using individual airfields and the number of movements each type made, the results were illuminating. Of the 94 airfields in military use in the UK either regularly or occasionally, the following numbers of airfields had noise contours extending to include one or more properties outside the perimeter of the base at different noise levels:

TABLE 1

| | Average $L_{Aeq}$ 12 hours (dBA) | | | | Max Single Event Level 82 dBA |
|---|---|---|---|---|---|
| | 83 | 75 | 72 | 70 | |
| No of Airfields | 10 | 36 | 36 | 70 | 52 |
| No of houses | 118 | 2368 | 5075 | 6710 | 16473 |

With these figures we were able to see the effect of any change in noise compensation policy; particularly any change in qualifying levels for grant assistance.

## STANDARDS OF INSULATION

12. Here we were anxious to examine the cost effectiveness of different standards of insulation. The MOD researched [8] the relative costs and effectiveness, measured in terms of the Sound Reduction Index, of different standards of insulation, looking at windows, doors and roofs. We assumed that the walls of houses of normal brick or stone construction would have a SRI of 45-55 dB and are therefore the strongest element in the building envelope, requiring no further insulation. The results are summarised in this table:

TABLE 2. STANDARDS OF INSULATION IN BUILDINGS

| | Option | Cost (£) for an average dwelling | SRI |
|---|---|---|---|
| Windows | | | |
| 1 | Secondary windows with 4mm glass | 1070 | 36 |
| 2 | Secondary windows with 6mm glass | 1250 | 37 |
| 3 | Replace exisiting glass with 12 mm glass | 1250 | 31 |
| 4 | Replace windows with thermal double glazing | 3050 | 28 |
| 5 | Triple glazing using double glazed sealed unit secondary window | 1650 | 38 |
| Doors | | | |
| 6 | Weather stripping | 100 (max per house) | 33 |
| Roofs | | | |
| 7 | 100mm thermal insulation | 150 | 28 |
| 8 | Sarking board to underside of roof; one extra layer of 9.5mm plasterboard to ceilings; | 1100 | 40 |
| 9 | 150mm reinforced concrete roof slab | N/A | 50 |
| 10 | 50mm sand plugging between joists | 1250 | 45 |
| 11 | Two extra layers of 12.7mm plasterboard to top floor ceilings | 850 | 40 |

13. In respect of roofs, our research showed that many properties would require additional structural support in order to carry the weight of extra insulation and that the end result may not be satisfactory. In addition, standard roof construction had a SRI of about 30 dB, and additional noise reduction would only be worthwhile if windows were fully insulated. Costs and practical installation difficulties would reduce the attractiveness of this option.

14. We concluded that the most cost-effective option was to continue the present policy of providing grants for secondary double glazing (Option (2)

above). This applies to permanent dwellings. Research so far into sound insulation of mobile homes suggest that they cannot effectively be insulated, and no consideration has been given to including them in a grant scheme.

## OTHER ASPECTS OF THE REVIEW

15. We gave attention to a number of other related factors, which we considered important in the context of alleviating annoyance to the householder from military aircraft noise. Among these were:

a. Public Relations. Liaison by station commander with local communities has been shown to be beneficial. While it is important to tailor operational procedures as far as possible for the local community for instance by amending take-off patterns, circuit flight paths and limiting ground engine running, it is vital that these efforts should be known and appreciated by the community. In addition, where special exercises take place, local people should be properly informed and helped to understand their significance. This programme of awareness can bring positive benefits to all concerned. Equally, it is important that where there are provisions for grant assistance, these should be fully advertised in a clear, unambigious way. The review found that previous literature was confusing, and recommended changes.

b. Development control: Liaison with local authorities. The review found the dialogue with local authorities who have responsibility for land use planning was not generally very good in relation to questions of environmental noise. Because of the importance of this for the avoidance of future problems, we concluded that a specialist post of Environmental Noise Officer should be created within MOD, whose duties would include liaison with local authorities, and the free flow of information on noise levels between MOD and those responsible for land use planning.

c. Injurious Affection Compensation. We looked at the provision for paying compensation where depreciation in property value had occurred as a result of noise from new public works. This has on occasions been of great value in the package of compensation measures for the house-owner, and we had no hesitation in recommending its continuance.

## POLICY CHANGES RESULTING FROM REVIEW

16. The Government decided in November 1985 to make certain changes to the policy in this area as a result of the review. The main changes were:

a. A reduction from 75 to 70 dB $L_{Aeq,12Hr}$ in the qualifying level for grant assistance.

b. Additionally, the inclusion of dwellings falling in the maximum single event footprint of 82 dBA where more than 20 movements a night occur regularly.

c. Grant assistance will continue to be on the basis of acoustic secondary double glazing. with weather stripping of doors where appropriate.

d. Noise levels around military airfields should be reviewed every 5 years.

e. An appointment of a specialist Environmental Noise Officer will be made.

## THE EFFECT OF POLICY CHANGES

17. It is too early to make any accurate prediction of the overall effect in terms of reducing the annoyance and distrubance felt by communities around military airfields. However there are some encouraging signs already. The one major scheme we have introduced since the announcement of the policy changes, at RAF Upper Heyford, has been welcomed by the local authority as being fair and reasonable. Overall, we expect to spend a further £10 M on present estimates in the next five years or so on compensation schemes for some 7,000 houses. We also anticipate that improvements in publicity and liaison will contribute to a greater understanding and tolerance of military aircraft noise in the vicinity of our many military airfields.

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