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NOISE AND HEARING CONSERVATION POLICY

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1. INTRODUCTION

In this paper I describe a developing Noise Policy at Nissan Motor Manufacturing (UK) Limited (NMUK). The Policy is still in its evolutionary stages, some aspects having been operational for a considerable time others being on paper and subject to revision before becoming operational.

To help put the Policy in context I will present certain information about the Company and site prior to policy items. Specification of noise levels for machinery is seen as an important, possibly the most important, means of controlling noise levels and exposures and this will be discussed in detail.

2. ABOUT NISSAN

NMUK was established in October 1984 on the 730 acre site formerly Sunderland Airfield. The Company is a wholly owned subsidiary of Nissan Motor Company of Japan.

The initial development became operational in 1986. Facilities at this time were assembling Nissan Bluebirds from mainly imported body panels, treatment and painting of the body prior to final assembly. Just three years later body panels are pressed on site from coiled sheet steel, plastic components are moulded, engines are assembled, and engine machining will commence in the near future. European content of the vehicles exceeds 70% and will reach 80% by 1991. There is a purpose built 2.8km test track and original facilities have increased in size by over 100%. The introduction of a second Micra class model in 1992 will mean a further massive expansion including an Aluminium casting plant which will start production during 1991.

Production levels have increased from 27,000 in the first year to 75,000 for 1989 with 200,000 planned for 1992, by which time the site will provide 3500 jobs on-site with a further 1000 jobs in associated Companies. Investment on site will exceed £620 million.

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3. A DEVELOPING POLICY

In preparation for the Regulations due in January 1990 the previously existing procedures and standards have been reviewed and where necessary revised. Where required additional aspects, have been incorporated. Each of these elements combine to form an overall policy.

The major elements to the Policy are:

1. Assessment of employee exposure to noise
2. Noise Control
3. Hearing Protection
4. Monitoring hearing Status
5. Education, Training and Information
6. Records and Reporting

In many ways a "green field" site, only 3 years in operation, eliminates the problems experienced on old sites. It does, however, introduce a number of other problems: These include: very rapid growth of site; custom built equipment in many areas with little prior information available concerning noise levels; a large number of contractors building equipment, few having specialist expertise in noise control. The lack of clearly defined legal requirements coupled with a generally poor understanding of noise has also created difficulties.

Our major efforts to date have concentrated on Assessment of employee exposure, noise control and hearing protection.

3.1. Assessment of employee exposure to noise

3.1.1 New Facilities - Evaluation of each major item of machinery against specification will have been carried out previously and assessed against Specification. Operator exposure is assessed, where possible, during pre-production trials using a combination of sound level meter measurements and dosimetry. A survey carried out over a few 2 hour running periods at reduced speeds should enable main problem areas to be identified.

3.1.2 Established Production Facilities - When production levels are established detailed noise survey work can be completed. In addition to area noise level measurements carried out on the site grid system and identification of principle noise sources (including octave band analysis), task assessment is carried out using sound level meter. Where task noise exceeds 80dB(A) dosimetry is used.

Dosimetry measurement periods vary depending on the nature of the tasks.

For repetitive short cycle tasks typical of production line processes a period of at least 2 hours and more usually 4 hours is used. Unless tasks are observed to be identical and in close proximity grouping of operators is not carried out. Grouping where carried out is validated by sound level meter and using more than one subject for dosimetry. Where practical all operators are included in dosimetry.

For non-repetetive tasks such as maintenance full shift dosimetry measurements are used along with brief interviews about work done. These measurements are based on all personnel being individually assessed and often two shifts will be used. No grouping is carried out, however, by nature such measurements will only ever be indicative.

In meeting rooms and rest areas octave band analyses are carried out for comparison with NR curves.

Reassessment is undertaken as required when significant changes occur.

3.2 Noise control

Existing specifications require noise levels from machinery to be less than 84dB(A) maximum at 1 metre. Early in 1988 we became very active in enforcing this requirement. We found that many items of equipment exceeded this level and issued notices that equipment "fails to meet specification". The most usual approach for retrofit measures is use of acoustic enclosure.

The specification is under review. Any proposal for a new specification had to meet the following criteria:

a) Specific limits which can be easily and reproducibly measured
b) Flexible, giving priority to operator locations
c) Require no specialist techniques or equipment

We also wish to:

d) Allow for transient increases in noise
e) Establish a limit for tonal noise
f) Establish procedures for agreed deviation from specification
g) Accept results from other standards

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There are three documents which form the Specification

a) Noise Standard
b) Standard Method For Assessing Noise
c) Report Form

The Noise Standard requires noise levels generated by machinery to be as low as reasonably practicable. It defines limits not to be exceeded:

	at workstations	75dB(A)leq
and	at any position 1m distant	79dB(A) leq and 90dB(A) max
and	variation between adjacent octave bands not to exceed 10dB (on 'A' weighted basis)	

All measurements to be taken under maximum load conditions.

At first appearance these limits may seem low, however, we were aware of the potential for multiple sources in close proximity and believe we have allowance for 3 direct sources within 2 metres. The majority of exposures to noise on site are from a direct source, reverberant noise has not been addressed separately as we believe that there is sufficient allowance in the Standard. There is also a small allowance for increase of noise due to wear, although we have Planned Preventative Maintenance Programmes which help to minimise such problems.

Impulse noise is to be assessed on case-by-case basis. Environmental noise criteria are set with an objective of not increasing noise levels at site perimeter. For noise critical areas the Standard makes provision for lower limits to be stipulated.

There are also special conditions where the standard cannot be applied such as Ultrasonic Welding Equipment for Plastics where we established an Ultrasonic Noise Standard.

In terms of noise control techniques we believe that noise should be designed out of equipment wherever possible. Local enclosures are acceptable where other methods are not practicable. Some processes are inherently noisy and we have examples of these set in separate building compartments e.g. plastic granulators, scrap steel conveyorage and compacting equipment, and plant rooms. For such items an agreed deviation from Standard can be raised and alternative arrangements for noise control implemented.

Where problems are identified information is fedback to Planning Engineers to avoid repetition.

3.3 Hearing protection

3.3.1. Designated Areas - We designate Hearing Protection Zones where operator exposure is likely to be 85dB(A) or above. We use the first action level only because we feel that the two action levels are unworkable in practice. Conventional mandatory hearing protection signs are used.

3.3.2. Designated Tasks - Where we can associate operator exposure of 85dB(A) or above to specific tasks, rather than the task and location combination, we will designate them as Hearing Protection Tasks. This is particularly useful for portable hand tools.

3.3.3 Enforcement -Enforcement is the responsibility of operational management and supervision. They are therefore fully involved in the administrative consideration of setting-up Designated Areas

3.3.4. Selection of Hearing Protection - We make available two types of hearing protection, the E.A.R. Plugs and Peltor H7 Defenders. The selection is based on performance of these products and operator acceptance.

We evaluate suitability using the British Standard method, slightly modified and deducting twice the standard deviation from the published mean attenuation data. We feel this makes allowance for imperfect fit of plugs and deterioration of defenders over a period of time.

To date these protective devices have served for all our needs.

3.4 Monitoring Hearing Status

3.4.1 Pre-Employment - Pre-Employment Medical Screening is undertaken for all employees. Included in this is a full audiometric assessment.

3.4.2 Routine audiometry - The Company does not at present operate a routine audiometry programme. This is under consideration however and at this stage the following criteria are being considered.

High Risk Groups	(e.g. >105dB(A) Leq, unprotected) compulsory every 12 months
Medium Risk Groups	(e.g. > 90dB(A) Leq, unprotected) compulsory every 2 years
Others	(e.g. >90dB(A) Leq, unprotected) every 5 years.

3.5 Education, Training and Information

All employees receive basic instruction about hearing protection during the first day of their induction. Noise control and hearing also feature in later stages of induction training.

Those who have been identified in pre-employment screening as having defective hearing receive counselling prior to employment when noise, the damage it can cause and protection are discussed in detail.

The reports on noise surveys are published and discussed in detail with operational management who are encouraged to make the findings freely available to the workforce involved. Follow up training is also run as required.

3.6. Records

Reports on noise surveys are kept by Safety Department, with the summary results of personal dosimetry being recorded on the Company personnel data base. No time limit for retention has been decided, however, it seems likely that they will need to be retained for 40-50 years.

Results of audiometric examination are kept by the medical centre in the individuals medical record. These records to all intent and purpose are retained indefinitely.