Proceedings of the Institute of Acoustics

CODES, STANDARDS AND CRITERIA FOR MOTOR SPORT NOISE

A E Watson

Partner, Acoustic Consultancy Services
Chairman, RACMSA Environmental Advisory Group

1. INTRODUCTION

In previous papers I have referred to a programme funded by the RACMSA (RAC Motor Sport Association) and the AMRCO (Association of Motor Racing Circuit Owners) The object of this programme was to investigate the effects of motor sport noise and establish better methods of controlling noise from fixed venues. The investigation began in 1994 and the Guidelines were published in 1996.

This paper discusses the need for the guidelines, the main issues addressed and some of the reaction to their introduction.

2. NEED FOR GUIDELINES

There are no established standards or criteria relating directly to noise from motor sport events. Like most outdoor leisure activities the onus seems to rest with the administrators of the sport to produce guidelines or codes of practice and with the venue operators to implement controls.

Noise in Motor sport has been controlled by the RACMSA since 1979 and the Regulations governing the sport include noise test methods and maximum permitted levels for the various types of motor sport throughout the UK. The tests are designed to provide the initial overall control of noise levels and prevent noisy vehicles from access to circuits.

It was recognised that this form of pre-event static testing was a fair and effective method of testing and controlling the noise from individual vehicles but did not relate directly to environmental noise impact. Vehicles being driven competitively under load can show different characteristics and the noise impact of a venue depends on many factors other than the loudness of individual vehicles.

There was, therefore, a need to produce some guidelines that could help venue operators to control noise more effectively and also assist officials who have the responsibility for controlling community noise levels. It should be made clear that the objective was to produce practical guidelines for noise control and not to try to establish standards or criteria for levels of motorsport noise.

3. THE MAIN ISSUES

The guidelines break down into two main areas of control.

a) SOURCE CONTROL

b) VENUE AND EVENT MANAGEMENT TO MINIMISE INTRUSION

These two areas have been the source of much confusion within the sport. It has been claimed that the existing noise regulations which control the source noise are not effective enough and there has been pressure to change the system. It is correct to say that in many cases the existing controls are not enough, but it is a mistake to say that changing the methods of controlling the source noise will provide the answer to noise problems.

The investigation into motor sport noise carried out as part of the development of the guidelines showed that community response to noise depends on many factors. It is important that, as well as using source controls, each venue produces its own management plan to reduce the effects of environmental noise. The guidelines include advice on other factors some or all of which may be applicable to individual venues.

a) SOURCE CONTROL

This can take various forms, it can simply be the selection of specific types of quiet vehicles (e.g. electric cars) or the inspection of approved silencing systems. The inspection of systems may not be sufficient to ensure compliance with noise regulations and this may require the judgement of a trained official who may carry out noise tests. In an event run under RACMSA regulations vehicle noise testing is compulsory, but venues do not require to carry out noise tests for other track use. The guidelines recommend that testing of some kind be carried out for all types of track activity before vehicles are permitted to use the track as this prevents the occurrence of high noise levels. The venue also has the ability to reduce the noise levels in the Regulations if necessary.

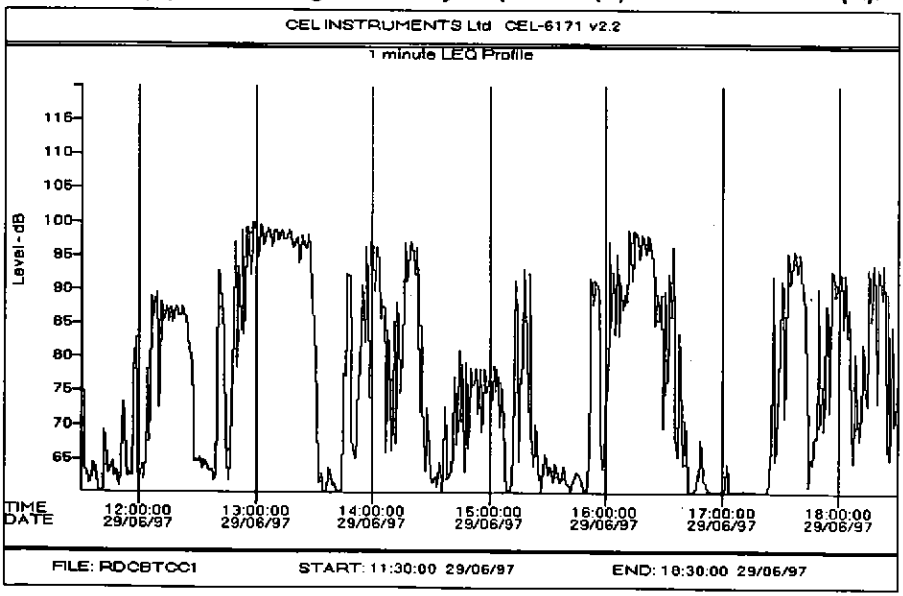
Other sources of noise from a circuit include tyre squeal, noise from public address systems and other activities not directly related to motor vehicles. Control of these sources is the responsibility of the venue operator.

b) VENUE AND EVENT MANAGEMENT

The object is to control the overall community noise impact of the venue and this requires addressing different issues to those associated with source control. As each venue is different, these controls will be venue specific and should form part of the management plan for operation of the venue. Noise from motor sport events does not remain constant throughout a day nor does it take place every day.

Even during one main race day the levels can change considerably.

1 minute dB(A)Leq levels of race meeting at 10m. from track.
Leq 90.2dB(A) 7 hours. Highest hourly Leq 95.5dB(A). Maximum 99.8dB(A).



One other factor for larger venues is the variation between noise from different track sections and their effect at specific locations. Variations in received noise at 500m from a circuit can exceed 20dB(A) between different sections of track at one location. These variables need to be understood when trying to control noise affecting areas close to the venue.

The changing nature of the noise allows for flexibility in managing venues to minimise impact in the community.

The factors to be considered include the following:

Hours of circuit use.
Number of days use.
Mix of quieter /noisier events
Timing of noisiest events.
Inclusion of breaks during an event day.
Pre-arranged quiet days with no community noise.
Monitoring and control of circuit noise.
Liaison with the Local Authority and the community.

The correct combination of some or all of the above factors is of more benefit than reducing individual vehicle noise by 2 or 3 decibels. Although vehicle noise reduction is important in the long term, small reductions may not be noticed by the community. Breaks in the noise and quiet days will be noticed.

As noise levels from vehicles have decreased over the years, further source reductions become more difficult and greater emphasis must be placed on the other methods of controlling noise from venues.

4. REACTION TO GUIDELINES

Although the Guidelines were compiled by a Technical working group comprising a broad section of informed opinion, it was felt that other bodies and individuals should be able to make constructive comments following the initial use of the document.

In 1996 the AMRCO and the RACMSA published "Guidance Notes on Noise Control at Motor Sport Circuits" as a Consultative Document . To date there has been a very mixed response. There has been some praise from those who have welcomed the advice but some individuals and Local Authority officials have been critical about the lack of specific environmental noise values. This is an understandable reaction from officials who have to deal with noise complaints as it would make their job easier if there was a set of values they could use. This reaction completely misunderstands the purpose of the Guidelines and tries to make them into a "Standard" or a set of criteria to be used to assess impact or nuisance.

5.FUTURE DEVELOPMENTS

At present there is no intention to try to develop the guidelines into a Standard or to try to establish general criteria for noise levels. The Technical Working Group (TWG) responsible for producing the Motor sport guidelines were quite clear that trying to assess annoyance from an extremely variable source affecting residential and rural communities on occasional days was too complex an issue.

The latest version (1997) of British Standard 4142 admits that the quantitative assessment of community annoyance and the assessment of nuisance is beyond the scope of the standard. BS4142 deals with the effects of industrial noise affecting mixed residential and Industrial areas. That type of source noise is usually similar every day and simpler to assess than occasional noise from leisure activities. This surely confirms the decision by the TWG to concentrate on providing useful advice rather than try to produce standards or criteria.

From many discussions with track operators, Local Authority officials and community groups, it has been established that "acceptable" noise levels and methods of control are best left to local agreements. There are several venues throughout the UK which operate on this basis and have implemented their own controls which work effectively for their own local circumstances.

The RACMSA, as the sports governing body, recognises that it has a responsibility to provide an overall framework for noise control within the UK. It will continue to include noise regulations applicable to all competing vehicles and to train officials to carry out the tests required by the regulations. As these tests apply to all categories of the sport throughout the country, they must be fair, repeatable, relatively quick to carry out and understandable by officials and competitors. Failing a noise test can result in a refusal to start or exclusion from an event and this means that the test results may be subject to scrutiny at an appeal hearing. This imposes restrictions on the methods available

for noise testing and although the current static test may not be perfect, It meets the judicial requirements and has contributed to the overall reduction in noise from motor sport.

Future developments for source noise control are always under review by the RACMSA and there are several proposals for 1998. These include further reductions in static test levels for certain classes of competing vehicles with a view to creating quieter periods throughout an event day. Other methods of controlling individual vehicle noise will be examined to try to reduce the need for static testing of all vehicles prior to every event. In some cases where static testing is difficult (e.g. Kart Racing) it may be possible to approve known effective silencing systems which would only require random testing. Other methods to be investigated include drive-by tests for hill climbs and sprints where the vehicles compete singly and can be measured individually.

The various methods under consideration are being examined to try to improve the effectiveness and standardisation of noise testing of individual vehicles. The overall responsibility for control of environmental noise impact must continue to rest with the venue owner or operator. It is only at this local level that individual decisions can be made as to the best method of noise control and management of the venue.

Although control of local noise is not the direct responsibility of the sport's governing body, the RACMSA will continue to provide assistance and back up to venues. The MSA employs a full time official responsible for Environmental and Health & Safety matters and he can provide advice on noise issues. There is an Environmental Advisory Group which can address noise issues raised by Clubs and Officials and also assist Local Authorities and other groups. During the last three years the MSA has trained and licenced over 200 Environmental Scrutineers to carry out noise testing at venues.

I would suggest that the best way forward is to ensure that venues try to comply with current regulations and the advice contained in the guidelines. This would certainly have a much greater effect on noise impact in the community than trying to introduce new standards or criteria that would be unacceptable to many operators and many local communities. In the final analysis all standards and criteria are compromises between what is acceptable and what is practicable. In dealing with outdoor leisure noise it is much better if this compromise can be reached at a local level rather than by the imposition of a National standard.

For those situations where agreement is impossible, the outcome is likely to be settled by a Court which would then apply its own standards, taking account of local conditions. Although this outcome may be less satisfactory to some parties, it is still likely to lead to a better solution than an inflexible National standard.