OVERVIEW OF ENVIRONMENTAL NOISE POLICIES IN AUSTRALIA*

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Abstract: Across Australia, legislation for environmental noise is largely the responsibility of each of the six States and two Territories. The Federal government has the responsibility for national issues such as aircraft noise and also to encourage harmonisation of the legislation and regulations among the States and Territories. Even though there has been an Australian Standard (AS 1055) on environmental noise for some decades, the assessment methods in this Standard are not necessarily followed in each jurisdiction. In some cases the assessment of the noise is on a different basis, such as comparison with background noise level or with a zone noise standard. In other cases the differences are minor, such as differences in the times for day and night. This paper will summarise and discuss the implications of the differences in the legislation and regulations.

1. INTRODUCTION

Australia is a federation of six States and two Territories (referred to as States throughout the paper). There are three levels of government: Federal, State and Local.

At the Federal level, the Department of Environment and Heritage includes Environment Australia. This organisation aims to achieve three major outcomes for the Commonwealth Government: the protection and conservation of the environment, especially those aspects that are matters of national environmental significance; benefit to Australia from meteorological and related science and services; and advancement of Australia's interests in Antarctica. There are divisions within Environment Australia with specific responsibility for aspects of the environment such as air and water but there is none specifically addressing noise. The predecessor to the current organisation (the Australian Environment Council) did take an active role in overseeing noise issues. In 1987 it produced a document summarising the approaches to legislation employed by governments throughout Australia for controlling various types of noise [1]. Unfortunately there is no such strong direction for harmonisation of noise legislation from Environment Australia. The Intergovernmental Agreement on the Environment (IGAE) [2] sets out the 'ground rules' under which the Commonwealth, State/Territory and Local Governments interact on the environment. It includes a broad set of principles to guide the development of environment policies and, in a series of schedules, sets out cooperative arrangements on a wide range of specific issues. The National Environmental Protection Act [3] allows for measures related to noise but only if differences would have an 'adverse effect on national markets for goods and services'.

The only noise sources that are controlled at the Federal level are aircraft and motor vehicles. Type approval noise testing is provided for prior to approval for registration. Each State has a department or agency responsible for development and implementation of environmental legislation and policy. Most of these are currently named Environment Protection Agency or some similar title. Local government is responsible for the implementation of many of the policies developed by State governments, particularly those dealing with noise from residential premises.

2. FEDERAL NOISE LEGISLATION

The Federal noise legislation for motor vehicles relates to the maximum noise emission for approval for registration in Australia. This legislation is based on the International Standard 'drive by' test and the limits are in general agreement with international best practice [4]. The need to update the Australian Design Rules as more stringent criteria are established (usually in Europe) is carefully considered by the appropriate authorities. It is the responsibility of State governments to control the noise of in-service vehicles. Compliance with noise limits for certification of new aircraft types is in accordance with international specifications [ICAO]. Environmental Protection Regulations for Airports [5] include noise criteria which specifically address airport activities and do not apply to aircraft when in flight, landing, taking off or taxiing. An Australian Standard, AS2021 [6], provides guidelines for land use planning in the vicinity of airports with criteria based on the Australian Noise Exposure Forecast (ANEF). Compliance with these guidelines is not mandatory but is strongly supported by Air Services Australia and the Federal Department of Transport and Regional Services (DOTARS). This Department has a management role over any works to minimise the noise impact of major airport developments, such as the Sydney Airport Noise Insulation Program following the construction of a new runway.

* The views expressed in this paper are not necessarily those of the authors' organisations

3. STATE NOISE LEGISLATION

While there had been some means of controlling clearly excessive noise, it was not until the 1970s that comprehensive noise legislation was introduced by most of the Australian States. This legislation was usually specific to noise, with names such as 'Noise Control Act'. Subsequent revisions and changes in approaches to policy throughout most of Australia led to the introduction of integrated environmental legislation to cover all aspects of the environment. Environment protection policies, regulations or guidelines were then introduced to address specific aspects of the environment. A major advantage of this approach is that it allows changes to be made more rapidly than would be the case should the Act need to be changed.

It is acknowledged that changes in the views of the States on the appropriate approach for controlling environmental noise impact are brought about by many factors. These include experience with the implementation of the current policy, changes in community expectations, changes in government, dissemination of research information, technological improvements in noise measurement, international experience, etc. Revision of policy documents generally occurs around every 7 to 10 years. As the different State agencies do not revise their policies at the same time, there will inevitably be differences in approach. However, as long as the States justify to themselves the need for different criteria, there will be an impact on companies and suppliers operating on an Australia-wide basis. Noise assessments may need to be repeated because of the different State legislation. Plant designed to meet the requirements in one State may need modification to operate in another State. Cooperation between State authorities will be required to deal with noise issues arising from any activities operating close to adjoining State boundaries.

3.1 Industrial Noise

In each of the States, the basic method for assessing excessive noise involves measurement or prediction of the noise level in terms of dB(A). A correction for the nature of the noise is applied and comparison is made with the criteria considered to be acceptable for the time of day and the nature of the area. However, there are important differences between the States in the implementation of this basic procedure.

An Australian Standard specifying measurement and assessment methods for environmental noise was first published in 1973 and has been revised and expanded on a regular basis [7]. The standard (AS 1055) includes inter alia an assessment method based on measurement of the background noise level. It also gives estimated average background levels based on six types of areas and three time periods; 0700 to1800, 1800 to 2200 and 2200 to 0700 hrs. For Sundays and public holidays 0700 hr is changed to 0900 hr to allow for additional sleep. It is important to note that an Australian Standard has no legislative power itself. It is up to each State to decide if it wants to refer to all or part of the

Table 1. General Methods of Assessing the Extent of Noise Impact

State	Assessment	Descriptor	Time Zones*	Web based information
Queensland	Background	L_{Aeq}, L_{A10}	0700-1800 1800-2200 2200-0700	www.epa.qld.gov.au/environment/misc/publications/
New South Wales	Zone and Background	L_{Aeq}	0700-1800 1800-2200 2200-0700	www.epa.nsw.gov.au/publications/noise.htm
Victoria	Zone and Background	L_{Aeq}	0700-1800 1800-2200[1] 2200-0700	www.epa.vic.gov.au/publications/legislation/sepps.asp#noise
Tasmania	Background	L_{Aeq}	0700-1800 1800-2200 2200-0700	www.dpiwe.tas.gov.au
South Australia	Zone and Background	L_{A10}	0700-2200 2200-0700	www.environment.sa.gov.au/epa/pub.html
Western Australia	Zone	L_{A1},L_{A10}, L_{Amax}	0700-1900[2] 1900-2200 2200-0700	www.epa.wa.gov.au/
A.C.T.	Zone	L_{A10}	0700-2200 2200-0700	www.environment.act.gov.au
Northern Territory	Zone	L_{Aeq}	0700-2200 2200-0700	www.lpe.nt.gov.au

* Night-time for Sundays and public holidays is extended in most States

[1] Saturdays 1300 – 1800 and Sundays and public holidays 0700 – 1800 treated as evening

[2] Sundays and public holidays: 0700 – 0900 treated as night and 0900 – 1900 as evening.

standard in legislation.

There are some parts of the Standard that have been adopted by the States. For example, there is general agreement that the measurement location for the assessment of annoyance should be at the nearest affected residence. For those States that base the criteria for assessment on limits for noise zones, there may be additional measurement locations required at the zone boundary. All States require the assessment to be in terms of A-weighted decibels. Formerly, the percentile level (L_{A10}) or the average-maximum value (L_{Amax}) was the descriptor used for assessment of the noise from a source, but now there is a general trend towards the use of the equivalent energy level (L_{Aeq}) and recent changes in legislation have incorporated its use [8]. The minimum time period for monitoring is normally 15 minutes. However, the availability of automatic data loggers enables the noise monitoring to be commonly undertaken for longer time periods, with shorter attended measurements used to verify the actual sources of the noise. The methods for applying corrections for the nature of the noise are generally similar and based on the procedures in AS 1055, but there are some differences in applying multiple corrections, such as for a noise which is both tonal and intermittent.

Table 1 summarises the general method of assessing the extent of noise impact for each of the States. It is clear from this table that assessment procedures used by the States differ. Earlier versions of AS 1055 essentially recommended comparison with background noise as the primary method of assessment and most States adopted this approach in earlier legislation with the criterion being an excess of +5 dB(A). The current move away from this method of assessment reflects the difficulties that were encountered in practice, in particular the difficulties experienced in basing the assessment on a noise level descriptor which itself varied from day to day and from week to week. An interesting approach is the recent NSW Industrial Noise Policy [8] which allows for assessment based on intrusiveness using comparison with background noise levels and/or amenity using comparison with criteria specific to the land use.

3.2 Specific Noise Sources

In addition to a policy for controlling noise from industry, each of the States has introduced policies or guidelines for dealing with other types of community noise sources, such as outdoor concerts, motor sports, shooting ranges, standby generators, chain saws, etc. These specific policies establish environmental noise criteria to meet the needs of the surrounding communities whilst accepting the rights of other members of the community to participate in various activities. Considerable negotiation is often required between the representatives from the organisations involved with the noisy activity and the surrounding community. Different approaches have been found to be more effective for different types of noise source.

Permitted hours of operation

This method has been found to be an effective approach for controlling general community noise. For example, the use of lawn mowers has been restricted to daytime hours, while amplified music/parties are allowed until late at night. Of course the policies allow for further investigation if the noise is excessive even during normally permitted hours. This control method is easy to enforce by administering authorities such as the police or council officers since noise measurements are not required. In addition, the complainants have a clear statement of their rights. This approach is also used for activities such as construction, which are known to be noisy but are generally short-term. Usually such activities are permitted only during daytime, Monday to Saturday, thus providing for a quiet Sunday.

Maximum noise levels

For other types of noise sources in community areas a maximum allowable noise level is specified. Some examples of this type of control are noise limits for mobile street vendors, residential pool pumps and domestic air conditioners. This approach requires measurement and so needs investigation by the local government noise inspector.

Combination of controls

Some community activities can be controlled by a combination of methods. Typical examples are outdoor recreational activities such as concerts and motor sports, which occur on an irregular basis. There is a need to establish a balance between the rights of the nearby residents and the rights of those who enjoy the activity. The goal of most of the State policies for this type of noise is to encourage good management of the facility and minimisation of the environmental noise impact. Another approach is to set an upper limit for the noise but also use incentives to encourage the proponents to further limit noise levels. Such a policy is that developed in one of the States for motor sports [9]. The venue receives an annual allowance of event credits, each having a value of 5 dB(A). Thus more events can be held if there is simultaneous use of the venue by less noisy activities.

There is as yet no environmental legislation specifically addressing vibration. However, vibration is accepted as an issue and some agencies are currently drafting guidelines for its control. Most States have policies and guidelines for vibration associated with blasting and mining and these are generally in accord with the Guidelines to minimise annoyance due to blasting overpressure and ground vibration published by the Australian and New Zealand Environment Council [10]. The guidelines specify limits at the nearest affected residences for blast overpressure and ground vibration. Incentives for blasting during the day are provided by having lower limits specified at other times. Guidelines for vibration in buildings where occupants could be affected can be based on whole body vibration limits in accordance with the Australian Standard [11]. The British Standard, BS 7385 Part 2 [12], is commonly used for evaluating effects of vibration on structures.

3.3 Transportation Noise

Over recent decades there has been a growing community reaction to noise from all forms of transportation (road, rail, air and water). Noise has been an important issue to be resolved in the environmental impact assessment of new and

upgraded transportation links. When the issue has not been resolved adequately, considerable community reaction to developments considered to produce unacceptable noise has continued and ultimately resulted in the installation of mitigation measures. This result has emphasised the importance of resolution of potential problems at the approval stage and the demonstration that best management practices are being used.

Setting noise limits for aircraft as part of certification is the responsibility of the Federal government. In relation to planning guidelines, criteria are given in Australian Standard AS2021 [6] in terms of ANEFs (Australian Noise Exposure Forecasts). Compliance with these criteria is not mandatory for State and Local governments.

The control of noise from road traffic is the responsibility of State and local governments. Most States have maximum noise levels specified in guidelines or expressed as environmental goals. These levels may be specified in policies or codes of practice prepared by the agency involved, which could be a transport and/or environmental authority. Many of the guideline criteria have been based on an $L_{A10(18hr)}$ value measured at 1 m from a building facade. Typically the criteria for residential areas near existing roads vary from 65 to 68 dB(A) with a lower criterion of 63 dB(A) for new or upgraded roads. There is a trend towards the use of L_{Aeq} and a general lowering of the criteria for new developments. The recently adopted criteria in New South Wales [13] are in terms of daytime, $L_{Aeq(15hr)}$, and night time $L_{Aeq(9hr)}$ levels. The majority of the criteria are based on measurements taken from the front of an affected building facing a busy road. The ACT Government acknowledges that a lower criterion is applicable to the private open space in a garden and uses a guideline $L_{A10(18hr)}$ value of 58 dB(A).

The criteria are usually applied on the basis that the responsibility for any change lies with the proponent. Thus it is the authority that is building a new road or upgrading an existing road that needs to ensure compliance with the criteria by including mitigation measures where necessary. For new developments near existing roads it is the responsibility of the developer to incorporate mitigation measures to ensure compliance with the criteria.

The States also have the responsibility for controlling noise from rail traffic. Most specify maximum noise levels in guidelines or express them as environmental goals in policies or codes of practice. The greater demand for public transport has led to a growth in rail travel in the major cities, with duplication of portions of the existing network, the installation of new sections of line and proposals for faster trains. The noise impact of these upgrades has been of concern to nearby residents and a number of the agencies are developing more comprehensive policies to address these concerns.

4. FUTURE DIRECTIONS

In general, the various environmental agencies in Australia can best be described as reactive rather than proactive. However, there is a growing recognition, the result of an increasing number of complaints, that more emphasis should be placed on prevention of noise problems. Unfortunately, there is very little research undertaken in Australia to assess the effects of noise on people. There is also little formal assessment of the effectiveness of noise policies and procedures. Any statistics that are collected are related to the number of complaints received and processed and the number of environmental impact assessments evaluated.

Thus the Australian environmental agencies tend to look to international initiatives when assessing the need for new or changed policies. For this reason the recent European Parliament Directive on Environmental Noise 2002/49/EC [14] may, in due course, have some impact on environmental noise in Australia. This directive aims to provide a common basis for tackling the noise problem across the European Union. A key feature is the production of "strategic noise maps" for towns with more than 250,000 inhabitants. The Australian agencies should be able to learn from the experience that will be gained by this large European undertaking and decide if such mapping would be worthwhile. The European Directive also requires assessment in terms of L_{den} (day-evening-night equivalent level) and L_{night} (night equivalent level). The L_{den} has a weighting of +5 dB(A) for evening hours (1900 to 2300) and +10 dB(A) for night (2300 to 0700). There is already a tendency in Australia to move towards the use of L_{Aeq} for noise assessment, so again the vast experience gained with the use of these units in Europe may influence future Australian criteria.

5. CONCLUSION

Most of the environmental legislation in Australia is developed, implemented and enforced by State governments and there are still important differences between the States on approaches to noise assessment and setting criteria. There is a move toward harmonisation of policy approaches. Until harmonisation has been achieved, the differences will continue to cause problems for companies and product distributors operating in more than one State in areas close to adjoining State boundaries.

Industrial noise is assessed by comparison of measured levels with either background noise levels or zone noise standards. Criteria have been established by most States for road and rail noise. The approaches to noise control for other types of noise source take into account the nature of the noise source with the most common control measures based on permitted hours of operation and maximum allowable noise levels. As the various agencies are mainly reactive, any assessment of the effectiveness of a policy is usually based only on a reduction in the number of complaints.

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