

OCCUPATIONAL NOISE CONTROL IN AUSTRALIA – ITS POLICY AND MANAGEMENT

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ABSTRACT

Noise has long been recognized as one of the priority occupational hazards in Australia. Noise-induced hearing loss (NIHL) is probably the most prevalent occupational disease in Australian industries and it is the major cause of deafness in Australia. All six Australian States, the two Territories and the Commonwealth Government have their own legislation to manage occupational noise. Whilst these are not all the same they are similar and nearly all States and Territories have now adopted the Australian National Occupational Noise Standard into their legislation. The government structures and agencies that administer occupational noise legislation are also different in the different States and Territories. In this paper occupational noise legislation in the Commonwealth jurisdiction and in all Australian States and Territories will be summarized. Brief comparisons with legislation in American and European countries will be made. The government structure and relevant legislation and policies for occupational noise management in Western Australia will be explained. The role of WorkSafe Western Australia in enforcing the legislation and assisting workplaces to comply with it will be discussed.

SOMMAIRE

Le bruit est depuis longtemps reconnu comme étant l'un des principaux dangers dans le milieu professionnel en Australie. La perte auditive due aux nuisances sonores est, probablement, la maladie professionnelle la plus répandue dans les industries australiennes et est considérée comme étant la cause principale de surdité en Australie. Les six états composant l'Australie, les deux territoires et le gouvernement du Commonwealth ont chacun leur propre législation pour contrôler le bruit dans le milieu professionnel. Même si ces législations ne sont pas toutes identiques, elles présentent des similitudes et presque tous les états et territoires ont jusqu'à présent adopté dans leurs législations les normes nationales australiennes concernant les nuisances sonores dans le milieu professionnel. Par ailleurs, chaque état et territoire est doté de structures et d'agences gouvernementales propres pour lutter contre le bruit au travail. Cet article résumera les législations appliquées en matière de bruits dans la juridiction du Commonwealth ainsi que dans tous les états et territoires australiens. De brèves comparaisons avec les législations américaines et européennes seront faites. Des explications seront apportées concernant la structure gouvernementale, la législation et les politiques appropriées mises en place pour la gestion du bruit dans le milieu professionnel en Australie Occidentale. Le rôle que joue l'organisme "WorkSafe Western Australia" dans le renforcement de la législation et dans l'aide apportée sur les lieux de travail, pour faire respecter les lois, sera examiné en détail.

1. INTRODUCTION

Noise at workplaces is one of the major occupational hazards in Australian industries and a major cause of deafness in Australia. Noise-induced hearing loss (NIHL) is one of the most common occupational diseases and costs Australian industry around \$33 million annually in compensation costs. The Australian National Occupational Health and Safety Commission (NOHSC) has declared noise as one of the seven national priority standards¹, which together are estimated to cover eighty percent of work related injury, death and disease within Australia.

Occupational noise had been managed in all six

Australian States, the two Territories and the Commonwealth Government under their own legislation. Since declaration of the Australian National Standard for Occupational Noise in 1993, which introduced the occupational noise exposure level of 85 dB(A), it took several years for most of the Australian jurisdictions to adopt the National Standard into their own legislation. This adoption process has not been completed yet, as South Australia is still in the final stage of its adoption. The adoption of the amendment made to National Standard for Occupational Noise in 2000 was much quicker. This changed the peak sound level from 140 dB(lin) to 140 dB(C). Most of the jurisdictions have already made the change in their legislation.

With the declaration of the new European Union Directive on the Minimum Health and Safety Requirements Regarding Exposure of Workers to the Risks Arising from Physical Agents (Noise) on 15 February 2003 (EU Directive 2003/10/EC 2003), which requires action to be taken at significantly lower noise levels, NOHSC has recommended a full review of the Australian National Standard for Occupational Noise commencing in mid-2004¹. It is expected that some major changes are going to be made through the review, which will help significantly improve the acoustical environment of Australian workplaces.

2. REGULATIONS FOR NOISE CONTROL IN AUSTRALIA

As a commonwealth country, Australia consists of six States – New South Wales (NSW), Victoria (VIC), Queensland (QLD), Western Australia (WA), South Australia (SA) and Tasmania (TAS), and two Territories – Northern Territory (NT) and Australian Capital Territory (ACT). Combined with the Commonwealth Government, there are nine jurisdictions in Australia and each of them is responsible for its own occupational health and safety acts and regulations, making occupational noise related regulations vary across the nation.

2.1 Australian National Standard for Occupational Noise

The National Standard for Occupational Noise, which referenced Australian Standard AS 1269, was declared by NOHSC in 1993. This gave the exposure standard in the occupational environment as an eight-hour equivalent continuous A-weighted sound pressure level, $L_{Aeq,8h}$, of 85 dB(A). The peak noise level standard started as a linear peak sound pressure level, L_{peak} of 140 dB(lin). In 2000, NOHSC amended the National Standard for Occupational Noise and the relevant Code of Practice to update the measurement of peak noise level to a C-weighted peak sound pressure level, $L_{C,peak}$, after AS/NZS 1269 made this revision in 1998.

The Australian NOHSC National Standard is generally consistent with most international practices, such as the United States NIOSH (National Institute for Occupational Safety and Health) recommended standard, the New Zealand standard and most Canadian standards (like Australia, exposure level standards set in Canada vary across its 14 jurisdictions). The Australian NOHSC National Standard is generally consistent with the present European legislation but differs from the new EU Directive 2003/10/EC 2003, as follows¹:

the EU Directive requires the provision of worker information and training, noise assessment, personal hearing protectors and audiometric health surveillance at an exposure level of 80 dB(A) $L_{Ex,8h}$;

the EU Directive identifies an 87 dB(A) continuous exposure limit and 137 dB(C) peak exposure limit.

the EU Directive requires that noise risk assessments take into account exposure to ototoxic chemicals.

NOHSC is planning a full review of the National Standard and National Code of Practice from mid-2004¹. The issues listed below are recommended for consideration as part of the review:

1. whether to adopt an 80 dB(A) action point and a peak noise level $L_{C,peak}$ of 135 dB(C);
2. whether to include the risks associated with the non-auditory effects of noise;
3. whether up-stream responsibilities should be incorporated in the National Standard or retained in the National Code of Practice;
4. whether to include information on the effects of noise in the range 55-85 dB(A);
5. whether to include reference to the effects of ototoxins in the Code of Practice;
6. whether to include information on acoustic shock in the Code of Practice.

2.2 Occupational Noise Regulations across Australia

The National Standard in itself does not have any legislative force. In Australia's nine jurisdictions, each has its own legislation for occupational health and safety. National Standards and Codes of Practice are declared as guidance and encouragement for a uniform approach across the Nation. However there is no compulsion on jurisdictions to take up the National Standards. Some jurisdictions have automatic update to the latest version of any Australian Standard referenced in their legislation, while others require an amendment. More and more States and Territories have now adopted the National Standard for Occupational Noise into their legislation. Ten years after the declaration of the National Standard, the process of adoption is still going on. The status of adoption of the National Standard for Occupational Noise cross Australian jurisdictions is shown in Table 1.

Table 2 summarises the Acts and Regulations across Australian jurisdictions for administering occupational noise². It can be seen that in some jurisdictions, the Occupational Safety and Health Regulations also cover the mining and petroleum sectors, and in other jurisdictions, there are individual regulations for mining and petroleum industries.

Key Element	Consistency by Jurisdiction								
	NSW	Vic	QLD	WA	SA	TAS	NT	CWTH	ACT
1 Exposure is an eight-hour equivalent period.	Y	Y	Y	Y	Y	Y	Y	Y	Y ⁴
2 Continuous exposure is an A-weighted level of 85dB.	Y	Y	Y	Y	N ³	Y	Y	Y	Y ⁴
3 Peak noise exposure is a C-weighted level of 140dB.	Y	Y	Y	Y	M ²	M ²	M ²	Y	Y ⁴
4 Exposure is measured at the employee's ear position.	Y	Y	Y	Y	Y	Y	Y	Y	Y ⁴
5 Measurement does not take account of protection from personal hearing protectors.	Y	Y	Y	Y	Y	Y	Y	Y	Y ⁴

Table 1 Status of adoption of the National Standard for Occupational Noise (as at 30 January 2004)

NOTES:

- Adoption is assessed against key elements of the National Standard (which are defined as aspects of the standard for which national consistency is considered important). The assessment is as follows:
- the following coding has been used to record each jurisdiction's legal requirements against each key element:
 - Y** the key element has been fully adopted in the jurisdictional framework;
 - M** most of the key element has been adopted in the jurisdictional framework;
 - N** the key element has not been adopted in the jurisdictional framework; and
- the assessment is not restricted to OHS regulations. It is determined by whether a jurisdiction has a legal requirement equivalent to the key element irrespective of the body of legislation or legal practice that provides the basis for the requirement.
- Peak noise measurement was revised from linear to C-weighting in the second edition of the National Standard, which was released in 2000. Some jurisdictions have not yet adopted this change, although all intend to do so.
- South Australian (SA) regulation, which still has an exposure standard, $L_{Aeq,8h}$, of 90 dB(A) for existing workplaces, is currently being revised to adopt the national exposure standard of 85dB(A). The new regulation is expected to be declared in 2004.
- The National Standard and Code of Practice are adopted as codes of practice under the ACT *Occupational Health and Safety Act 1989*.

3. NOISE-INDUCED HEARING LOSS IN AUSTRALIA

One of the most important and also obvious consequences of noise exposure is noise-induced hearing loss (NIHL). Occupational induced deafness represents a very significant social and economic burden for Australia, and it is still the only indicator for the impact of occupational noise.

3.1 NIHL Compensation Claims and Costs

Workers compensation data from 2000-01 identify that 3.9% of all claims were for sound and pressure related injury, and deafness accounted for 22.1% of all work-related disease claims. In total there were 5565 work-related deafness compensation claims. The average cost of each of those claims is about \$6000, which sums up to over \$33 million a year³. It has been estimated that the actual cost, direct and indirect, of workers' compensation claims is at least 10 times the average direct cost⁴. Based on the national average this would be a cost of \$330 million per year to the country.

When compared with data of the previous years, it can be seen that the number of NIHL claims decreased significantly from 1995 (Fig. 1¹). The total number of NIHL claims in 2000-2001 was only 43% of that in 1995-1996. The total cost of NIHL compensation dropped even more, from about \$85 million in 1995-1996 to about \$33 million in 2000-2001. Preliminary figures for 2001-2002 show similar results with 4792 claims costing \$32 million⁵.

Jurisdiction	Regulations
ACT	ACT has no regulations on occupational noise, but approved the National Standard and National Code as its own Code of Practice on 1 March 2001.
NSW	(i) Occupational Health and Safety Regulation 2001. (ii) Mines Inspection General Rule 2000. (Covers minerals) (iii) There are currently no regulations on occupational noise for coal and shale mines. The government is intending to adopt the relevant provisions of the Occupational Health and Safety Regulation 2001 by November 2004.
VIC	(i) Occupational Health and Safety (Noise) Regulations 2004. (Also covers mines)
QLD	(i) Workplace Health and Safety Regulation 1997 (Part 10 : Noise). (ii) Mining and Quarrying Safety and Health Regulation 2001 (Covers minerals). (iii) Coal Mining Safety and Health Regulation 2001.
SA	Occupational Health, Safety and Welfare Regulations 1995 (also cover mines and petroleum).
WA	(i) Occupational Safety and Health Regulations 1996. (ii) Mines Safety Inspection Regulations 1995 (covers coal and minerals). (iii) Petroleum Act 1967 (Onshore). (iv) Petroleum (Submerged Lands) Act 1982 (Coastal Waters).
TAS	Workplace Health and Safety Regulations 1998.
NT	(i) Work Health (Occupational Health and Safety) Regulations 1992 (ii) Mining Management Act 2001. (iii) Petroleum (Occupational Health and Safety) Regulations 2001.
CWTH	Occupational Health and Safety (Commonwealth Employment) (National Standards) Regulations 1994.

Table 2. Regulations and Acts in Australian jurisdictions governing occupational noise (as at 31 March 2004)

Although the NIHL claim reduction appears significant, it does not mean that noise-induced deafness in Australia has been reduced significantly. On the contrary, a recent study by MINEHEALTH of the Department of Industry and Resources of the Western Australian Government has found that the proportion of mine workers with a hearing loss more than five per cent (adjusted for age) has increased by 4.3 per cent over the past 5-6 years, despite high levels of industry compliance with existing noise control regulations⁶.

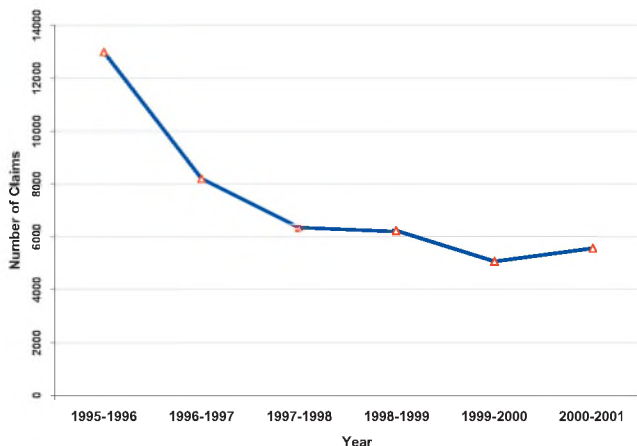


Figure 1. Five-year trend of NIHL claims.

4. Thresholds for NIHL Compensation

A likely reason for the decreasing number of deafness claims is that the various jurisdictions in Australia have introduced compensation thresholds for percentage loss of hearing (PLH) in the past few years. These thresholds vary between jurisdictions¹, as illustrated in Table 3. The thresholds used in each jurisdiction require that a certain PLH be attained before a NIHL claim is valid. Also introduced with the thresholds were more closely controlled audiometric testing and analysis procedures. Other factors in the changing labour market, such as more self-insured, casual, contract hire, subcontracting workers, may also have contributed to the decreasing number of NIHL claims in the national compensation statistics.

Table 4 shows the number of deafness claims and its percentage ratio to all work-related diseases in each Australian jurisdiction in 2000-2001³. It demonstrates that variations in the treatment of deafness claims across jurisdictions do affect the number of deafness claims and also its ratio over all disease within a jurisdiction. For instance, WA, TAS, NT and the Commonwealth had very few claims approved in 2000-2001.

Jurisdiction	WA ^a	SA	NT ^b	ACT	CWTH ^c	TAS ^d	QLD	VIC	NSW
% hearing loss threshold	10	5	5	5	20	5	5	7	6

Table 3 Industrial deafness thresholds in Australian jurisdictions
(as at 30 November 2001)

NOTE:

- a. Above baseline hearing loss previously assessed.
- b. Binaural hearing impairment.
- c. New legislation with 5% threshold has been implemented since 2001.
- d. Whole person impairment (percentage loss of whole body).

Jurisdiction	WA	SA	NT	ACT	CWTH	TAS	QLD	VIC	NSW	Australia
All disease	1431	3190	223	171	651	416	3557	4111	10246	23978
Deafness	95	270	0	0	24	0	447	465	3999	5300
%	6.6	8.5	0	0	3.7	0	12.6	11.3	39.0	22.1

Table 4 Number of occupational deafness claims and its ratio to all work-related disease claims across Australian jurisdictions in 2000-2001

Government Department	Acts and Regulations	Jurisdiction	Standards
Comcare Ministry of Employment and Workplace Relations Australian Commonwealth Government	Occupational Health and Safety Act 1991 (Commonwealth Employment) Occupational Health and Safety (Commonwealth Employment) (National Standards) Regulations 1994	Employees of Commonwealth Government within WA	$L_{Aeq,8h}$: 85dB(A) L_{peak} : 140 dB(C)
Safety, Health and Environment Division Petroleum Division Department of Industry and Resources Government of WA	1. Mines Safety and Inspection Regulations 1995 (covers coal and minerals) 2. Petroleum Act 1967 (Onshore) 3. Petroleum Act 1982 (Coastal Waters).	Employees in the mineral and petroleum resources industries within WA	$L_{Aeq,8h}$: 85dB(A) L_{peak} : 140 dB(lin)
WorkSafe WA Department of Consumer and Employment Protection Government of WA	1. Occupational Safety and Health Act 1984 2. Occupational Safety and Health Regulations 1996	Employees of all other workplaces within WA	$L_{Aeq,8h}$: 85dB(A) L_{peak} : 140 dB(C)

Table 5 Government Departments administering occupational noise in WA

5. OCCUPATIONAL NOISE MANAGEMENT IN WESTERN AUSTRALIA

In Western Australia (WA), noise at workplaces not only causes most of the deafness in the state, but also leads to increased absenteeism, employee turnover and lowered work performance. However, as Western Australia currently has the highest threshold for compensable hearing loss in Australia, the extent of the occupational noise problem might be significantly underestimated, compared with other jurisdictions.

5.1 Government structure in managing occupational noise in Western Australia

There are three government departments administering different occupational noise related Acts or Regulations in different jurisdictions within Western Australia, as illustrated in Table 5.

Comcare also manages the compensation of work-related injuries and diseases for commonwealth employees through the administration of the Safety, Rehabilitation and Compensation Act 1988. Another Western Australian government department - WorkCover - administers the Workers' Compensation and Rehabilitation Act 1981 for all other employees in Western Australia, in which $L_{Aeq,8h} > 90$ dB(A) and $L_{peak} > 140$ dB(lin) are currently used to define the "prescribed noisy workplaces" for baseline hearing tests.

5.2 The role of WorkSafe Western Australia

The WorkSafe Division of the Department of Consumer and Employment Protection (WorkSafe) is the state government agency in Western Australia responsible for the administration and enforcement of State's Occupational Safety and Health Act and Regulations through its 80 inspectors. Its jurisdiction covers all employees across the state except for Commonwealth employees and those working in the mining and petroleum sectors. This accounts for over 80% of all workers within the state. In addition to its regulatory role, WorkSafe provides information to industry and the community to assist in the prevention of work-related injury and disease. Its internet service, SafetyLine: Online (www.safetyline.wa.gov.au), is one of the leading services of its kind in the world and provides ready access to high quality information on occupational safety and health.

Regulations and Codes of Practice for controlling occupational noise

Western Australia's Occupational Safety and Health

Regulations 1996 adopted the National Standard for Occupational Noise and reduced the state's daily occupational noise exposure standard $L_{Aeq,8h}$ from 90 dB(A) to 85 dB(A) in 1999, and changed the peak level L_{peak} standard from 140 dB(lin) to 140 dB(C) in 2002. For technical aspects of noise measurement and selection of hearing protectors the regulations make reference to Australian/New Zealand Standard AS/NZS 1269⁷. The WorkSafe WA Commission published the *Code of Practice for Managing Noise at Workplaces* in 2002⁸, which provides Western Australian workplaces with practical guidance for managing excessive noise. Another Code of Practice, *Control of Noise in the Music Entertainment Industry*, originally issued in 1991, was revised and reissued by WorkSafe WA Commission in 1999 and again in 2003⁹. This was the first such Code of Practice in Australia and provides additional information on controlling noise in the entertainment industry.

All WorkSafe Inspectors are empowered to inspect all occupational hazards - including noise - in workplaces. They are supported technically by WorkSafe noise specialists. They have to check if the noise level in the workplace is excessive or not, and if so, they check if the noise has been controlled to its minimum practicably achievable level or not.

Practicable and control hierarchy

In many workplaces, when there is an excessive noise problem, employers simply choose the easy solution by providing their employees with hearing protectors. However, according to WA Occupational Safety and Health Regulations 1996, the employer '... must, as far as practicable, ensure that noise to which a person is exposed at the workplace does not exceed the exposure standard for noise.' Hearing protectors are to be used when it is not practicable to reduce the noise by other means.

The Code of Practice actually describes a noise control hierarchy when there is excessive noise in the workplace;

1. Eliminate the noise by replacing the noise sources or modifying the production techniques or procedures.
2. Engineering control of the noise by using passive or active noise control technologies.
3. Administrative control of the noise exposure levels by organising the work patterns to limit the exposure time of workers.

Thus, it is obvious that what is practicable is very important in controlling the noise at workplaces. When there is an excessive noise at a workplace, it is the employer's duty to demonstrate that the best practicable control measures have been implemented by assessing the noise problem and the control measures. WorkSafe Inspectors need to check if the employer has followed the

control hierarchy and implemented the best practicable control measures.

Proactive investigation of occupational noise issues in WA

In addition to responding to noise complaints, WorkSafe Noise Specialists also conduct proactive noise control projects, which target industries that have been identified as having more noise problems. A research project in the construction and metal manufacturing sectors was completed in 1998/99¹⁰. Through this project, examples of practical noise control in these industries were gathered and made available to a wide audience via case studies and a SafetyLine Institute lecture¹¹ on the WorkSafe website. In particular, a guide "Noise Management in the Construction Industry - A Practical Approach" was produced¹², illustrating how noise control measures should be taken into account through the phases of construction.

Music entertainment is another industry with many noise problems in Western Australia. The problem is becoming more serious due to the introduction of new, more powerful equipment for both live and pre-recorded music. The risk of people working in this industry suffering noise induced hearing loss and tinnitus has been recognised in WA by issuing the Code of Practice - Control of Noise in the Music Entertainment Industry⁹. The Code gives practical guidance on reducing noise exposure in venues and how to meet legislative obligations. It is aimed at venue owners, designers and operators, performers, promoters, technical and service staff and suppliers of sound equipment.

Previous experience in Western Australia and other Australian States shows that compliance with the noise aspects of occupational safety and health legislation is very low in the music entertainment industry. In March 2000, WorkSafe Western Australia noise specialists developed a project to carry out a series of inspections within the industry to establish whether venue operators were implementing appropriate noise management measures. More studies and investigations in this industry have been planned in the near future.

Problems and concerns

Some problems exist in Western Australia's occupational noise management and control, which need to be addressed and solved. They are:

1. Gap between the knowledge of new noise control technologies and the action taken by WA workplaces

This gap is even more obvious in Western Australia, a State with a very large percentage of small business (with less than 20 employees). It is estimated that almost half of

Western Australian workers are employed by small business. It is more difficult for small business to implement the latest noise control technologies, due to the small production scale, lack of funds, and lack of information.

WorkSafe tried to bridge this gap and did a research project in the construction and manufacturing industries in 1999¹⁰. The companies in these industries were encouraged to share their successes in practical noise control. The successful practices were promoted in WorkSafe's SafetyLine website as case studies.

Although some success was achieved in the previous attempt, the gap is still there and needs more efforts to fill.

2. Gap between the noise action standards adopted by WorkSafe and WorkCover

As discussed above, WorkCover, the State department administering the State's Workers' Compensation and Rehabilitation Act 1981, has an action level for hearing tests of $L_{Aeq,8h} = 90$ dB(A), which is 5 dB higher than WorkSafe's exposure standard. This can lead to confusion in workplaces that have employees exposed to noise between 85 and 90 dB(A). On one hand, they have to do everything practicable to reduce their noise exposure levels. On the other hand, they do not need to provide WorkCover hearing tests to their employees. As a result, employers may lack incentive to control the noise when it is within this range.

Also WorkCover currently has the highest threshold (10%) for compensable NIHL in Australia. Therefore, taking the number of compensation claims as the main indicator, significantly underestimates the occupational noise problem in the State compared with other jurisdictions. NOHSC is presently trying to develop new performance indicators that will give a clearer picture.

3. Managing low-level occupational noise

Worksafe has received many inquiries, concerns, and complaints of noise at workplaces where the noise levels are not over the noise exposure standard. These workplaces include offices, call centres, schools, hospitals, etc. The noise problem within these working environments is not hearing loss, but noise-induced stress, lack of concentration, lack of privacy, etc. With the IT revolution and changing work environment, more and more employees are working in office environments. It is expected that Worksafe will receive more and more concerns from these workplaces and have to deal with the noise problems in these working environments.

However at present, all the regulations for occupational noise in Australia are based only on hearing loss protection. They lack strong legal supports in managing and controlling low level noise.

6. CONCLUSIONS

There are variations in occupational noise standards and legislation adopted by Australian States, Territories, and the Commonwealth Government. These variations are not only in noise management and control regulations, but also in noise-induced disease compensation and rehabilitation standards and legislation. Now more and more jurisdictions have already adopted or are going to adopt the National Standard in occupational noise management. However, the variation in hearing loss compensation thresholds is likely to remain in the foreseeable future.

A major review of Australian National Standard for Occupational Noise is to commence this year. This will consider the new EU Directive on occupational noise, which significantly reduces the action noise level. If similar standards are adopted, these changes could lead to a significant reduction in the noise-induced hearing loss of employees and improvement in the acoustical quality of our workplaces. However, success is dependent upon how quickly the nine Australian jurisdictions review and make their own changes in accordance with the National Standard, and on how workplaces are encouraged to implement noise controls through a balance of enforcement and advice.

7. REFERENCE

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