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REFLECTIONS ON THE FUTURE DEVELOPMENT OF NOISE POLICY IN THE EUROPEAN COMMISSION

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1. INTRODUCTION

Future noise activities of the Commission of the European Communities in the area of environmental protection are laid down in the 5th Environmental Action Programme (EAP)[I] which was approved by the Commission and adopted by the Council in February1993. Noise activities are presented in a condensed way in table 12 of the 5th EAP (Vol II), s. table 1.

The objective "no person should be exposed to noise levels which endanger health and quality of life' is in agreement with Art. 130r of the EEC-Treaty. Taking the definition of health as defined by WHO, it is the scientific community of physicians, physiologists, psychologists, sociologists and acousticians to define "a state of complete physical, mental and social wellbeing" in terms of noise impact.The EC targets up to 2000 are very ambitious. Column 2 of table 1 shows that the Commission is willing to fight noise for the EC residents most affected by noise at all levels of legislation and administration (col 5). In column 3 actions are listed by which the targets of col 2 should be achieved. The further discussions shall be restricted to the actions: reductions of noise emission, standardization of noise measurement and ratings, noise criteria scheme for a noise abatement programme and measures related to infrastructure and physical planning.

2. REDUCTIONS OF NOISE EMISSIONS

2.1 VEHICLES

As you can see from table 2, the reduction of permissible sound pressure levels of vehicles has been 5 to 9 dB since 1972 and will be further reduced by 8 to 12 dB by 1996 [2]. This may be considered as quite a success achieved in steps over 18 or 24 years respectively.

In traffic noise motorcycles are normally not the most important factor with respect to Leq, but very often emit the most conspicuous noise - especially, when they are accelerated with full power. There is at present a draft proposal [3] in discussion covering all technical requirements for two- and three-wheel vehicles - including the acoustical requirements of spare exhaust systems. The permissible sound levels for the different types of two- and three-wheel vehicles which are envisaged for 1997 are shown in table 3. The values for motor cycles have already been drafted in a proposal of 1990. They were exactly

the same values which had already been laid down in the directive 87/56/EEC[4] - but on a voluntary base to the Member States rather than on a mandatory one.
But despite the engineering success in reducing noise from motor vehicles, the noise impact (noise immission) to residents living near roads and highways has been raised because of the increase in the number and power of the vehicles and the use of wide tyres. This has been proved in several investigations, eg recently by Leuner [5]. Performing noise measurements in 256 sites, most of them residential areas, in 7 major cities and towns in Bavaria during night-time, he found an increase of 3.3 dB on average in comparison to noise measurements made 15 years ago.
As a result one can see that lowering the noise emission levels of vehicles only is not sufficient to reduce noise impact on man. In order to protect man from noise we need noise quality criteria which must be carried through in the Member States.

2.2 RAILWAYS

There was a proposal for rail-mounted vehicles [6] 10 years ago. It has not been pursued anymore. As the railway lines for high-speed trains are being built now and in the next future, a directive on the noise emission of rail-mounted vehicles must be considered as urgent.The Austrian regulation [7] on this matter could serve as a possible model for such a directive.

2.3 AIRCRAFT

Initial action to reduce noise emitted from aircraft was taken by the European Community through the directive 80/51/EEC [8] amended by the directive 83/206/EEC [9] which phased out the oldest and most noisy airplanes (non-noise-certificated aircraft) by the end of 1986. The European Community then prevented similar foreign registered airplanes from landing in the Community from 1988.
In 1982 the European Commission started detailed planning for a non-addition [10]/non-operation [11] rule for the next noisiest category of airplanes,the so-called chapter 2 airplanes. The Directive 92/14/EEC[1l] has laid down that "Member States shall ensure that, as from 1 April 1995, civil subsonic jet airplanes fitted with engines having a by-pass ratio of less than two cannot operate at airports situated in their territory unless granted noise certification either": (a) to the standards of Chapter 3 airplanes; or (b) to the standards of Chapter 2 airplanes, provided that they were first issued an individual certificate of air worthiness less than 25 years previously.
There is a final cutoff date of 2002: All civil subsonic jet airplanes operating from airports of the Member States have to comply with the provisions of Chapter 3 aircraft. In a further step Chapter 3 airplanes will be considered. It is envisaged to reduce the requirements for that category of airplane by 3 dB.

2.4 Industry

A proposal has been drafted for a Council Directive on "Integrated Pollution Prevention and Control" (IPPC) [12]. It deals with the emissions from industrial installations. Pollution is defined as "the introduction by man, directly or indirectly, of substances, preparations, heat and noise into the environmental media...". Considering pollution mainly as an introduction of substances into the environmental media, emission limit values can even be required for noise, generally stating that the emission limit values shall normally apply at the point where the emissions leave the installation. From an acoustician's point of view I would prefer to apply immission limit values according to the categories of areas in the neighbourhood of an installation and to compare the sound pressure level measured at the appartment or house of a nearby resident with the appropriate immission limit values. Such thoughts necessarily lead to the idea of noise quality criteria.

2.5 CONSTRUCTION PLANT AND EQUIPMENT / MACHINES USED OUTDOORS

In the field of construction plant and equipment there exist some Council and Commission directives for specialized types of machines. When these directives were made, the primary scope was to avoid barriers of trade rather than to protect the environment against noise.

As to the revision of the directive for earthmoving machinery [13], the Commission has approved of a proposal in which from 1996 the permissible sound power levels are to be reduced by 4 dB on average in comparison to the values of 1988 [14]. The revision of the directives for compressors, tower cranes, welding and power generators [15] is being prepared based on a study performed by Frenking [16]. Under reasonable assumptions for a usual distance between a construction site and a housing area and taking into account the permissible sound immission level for residential areas as existing in some Member States, Frenking suggested revised and, in my opinion, feasible values of permissible sound power levels to be used in a future amendment (see table 4).

A Round Robin Test is going to be performed, to find out what procedure of measuring sound power levels of concrete hammers will be best, the one in which the mechanical energy is annihilated in a concrete block (present EC methode [17]) or the other one in which this happens in a cylinder filled with steel balls (PNEUROP).

There is, however, a general concern in the EC Working Group on Noise and Vibration that it makes no sense to issue 2 or 3 Council directives per year on the permissible noise levels of some types of powered appliances. This would be a costly and expensive procedure and besides, only a few selected types of appliances would be

covered by a directive, leaving most of the plant and equipment without any noise regulations. Several suggestions of the representatives of the Member States in the EC Working Group have been made. DG XI has envisaged the following solution- A framework directive issued as a Council Directive should be established requiring, that

1. all machines used outdoors must be labelled with their sound power levels and their sound pressure levels at the workplace, if any. This should be valid for new machines put on the market after a certain date;
2. the operating condition during the acoustical measurement is the rated speed, if not otherwise specified in a Commission Directive;
3. the measurement results have to be communicated to the Commission; the Commission or its commissioned contractor performs an analysis of the measurements and publishes its outcome.
4. the Commission has the authority to issue Commission Directives conceming

a) the specific operation conditions during measurements taking into account existing standards (CEN, ISO etc.);

b) the setting of permissible sound levels for the future based on the continously evaluated measurement results communicated to the Commission.

The main advantage of such an action is to be seen in the fact that all machines will be covered and, as Commission Directives can be more easily issued, that the directives can be adapted to the technical progress in a more flexible way. If the the Member States get the permission to grant tax incentives or "user's advantages" for low-noise appliances, even market forces could be promoted to force the manufacturers to provide the market with low-noise machines.

3. NOISE CRITERIA (PERMISSIBLE IMMISSION LEVELS)

To achieve noise quality control in order to protect EC citizens against unreasonable noise, a directive on noise criteria must be set up. As discussed above, the establishment of permissible emission levels of noise sources is not sufficient. The noise emission of a source is only one factor, often a very important one, influencing the noise impact. But other factors may also be important, e.g. the frequency of noise events, distance and, in the case of road or rail traffic, the condition of the road or track surface. When considering noise criteria the following subjects have to be discussed and clarified:

- choosing the most suitable descriptors for defining a noise situation, following ISO 1996 as closely as possible (LeqA for day- and night-time, maximum level of single noise events, assessment of conspicuousness of noise in respect to frequency and time fluctuation)
- review of noise quality criteria from selected countries; as a result of this review a scheme of noise quality criteria (permissible noise immission levels) may be proposed

- quantification of existing and future extent of noise exposure in the EC Member States
- how the competence between the Community and the Member States should be shared
- a cost/benefit analysis of the expenditure for noise abatement in relation to the depreciation of sites and properties, if no common EC directive on noise criteria comes into force.

The noise quality criteria should represent a minimum standard for all citizens in the EC. Individual Member States may have stricter values. Following the Swiss noise regulation [17] as a possible model, three types of noise immission levels are imaginable: planning cases, existing situations and alert cases - the latter comparable with the 65 dB(A)- value in the 5th EAP.

This value may represent a criterion for the necessity of redevelopment of inhabited areas.

Attention should be particularly drawn to publicly funded projects . Here one cannot be satisfied with just an environ mental impact assessment (EIA), even if it includes noise, but uniform action against noise on the base of CE noise criteria appear indispensable.

4. REFLECTIONS ON SUBSIDIARITY AND EC NOISE POLICY

As is well known the meaning of the expression subsidiarity is twofold [18]: Firstly, the responsibility for legislation or administration should be transferred to a level/unit as low as possible. Secondly,the superior level of legislation or ad ministration must take over the responsibility from the lower level, if at the lower level the required task cannot be accomplished. As to the permissible noise emission levels of appliances,this is clearly in the responsibility of the EC. Otherwise barriers of trade would endanger the internal market.

As to noise quality criteria, one might consider noise as a problem of short distances, in most cases not ranging beyond 1000 meters. One might argue, that it should be left to the individual Member State to decide how much noise they allow for their citizens without affecting their health and well being. As a consequence it is to be feared that noise problems fall by the sideway because of the different priorities an indvidual EC state has set.

For these reasons a directive on noise criteria on Community level would prove more efficient. From an estimation prepared for WHO [19] one can conclude that more than 10 % of the in habitants in Europe suffer a noise exposure of more than 65 dB(A) during daytime - an exposure which most people classify as highly annoying. As noise affects human health and well being in diverse ways, noise abatement is a serious task for the EC. This is in conformity with Article 130 r of the treaty on European Union stating: "Community policy on the environment shall contribute to pursuit of the following

objectives . . . - protecting human health . . .".

This article reflects the personal opinion of its author

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OBJECTIVE	EC TARGETS UP TO 2000	ACTIONS	TIME-FRAME	SECTORS/ACTORS
*no person should be exposed to noise levels which endanger health and quality of life	Night-time exposure levels in Leq dB(A): *exposure of the population to noise levels in excess of 65 should be phased out; at no point in time a level of 85 should be exceeded. * proportion of population at present exposed to levels between 55-65 should not suffer any increase *proportion of population at present exposed to levels less than 55 should not suffer any increase above that level.	*inventory of exposure levels in the EC *noise abatement programme to be set up *further reductions of noise emissions (cars, trucks,cranes,mowers etc). Directives to be presented progressively, aiming at implementation not later than 2000 *standardization of noise measurement and ratings *measures to influence behaviour such as driving cars, flight procedures, industrial processes operating at night time * measures related to infrastructure and physical planning; such as better zoning around airports, industrial areas, main roads and railways.	before 1994 before 1995 before 1995 continuous id id	Transport + Industry EEA + MS + *LAs* *MS* + *LAs* *EC* + MS + Industry EEA + *EC* + MS *MS* + *LAs* + EC *MS* + *LAs*

Table 1: The EC workplan for noise as defined in the 5th EAP

	Poids t	Puissance	1972 dB(A)	1982 dB(A)	89/90 dB(A)	1996 dB(A)
Heavy goods vehicles	>3.5 >3.5 >3.5	>150 75-150 <75	91 89 89	88 86 86	84 83 81	80 78 77
Light duty vehicles	2-3.5 <2	- -	84 84	81 81	79 78	77 76
Buses & Coaches	>3.5 >3.5	>150 <150	91 89	85 82	83 80	80 78
Minibuses	2-3.5 <2	- -	84 84	81 81	79(*) 78(*)	77(*) 76(*)
Passenger Cars			82	80	77(*)	74(*)

(*) the limit values are increased by 1 dB if the vehicles are equipped with a direct injection diesel engine

Table 2: Emission values for vehicles

Vehicle	Vehicle category by speed or cubic capacity	obsolete draft 1990			draft1993
		01.01.93	01.10.93	31.12.94	1.1.97
1. Two-wheel mopeds	≤25 km/h >25km/h	70 73	- -	- -	66 71
Three wheel mopeds	-	78	-	-	76
2.Motorcycles	≤80cm³ >80≤125cm³ >175cm³	77 79 82	75 - 80	- 77 -	75 77 80
3.Tricycles	-	80	-	-	80

Table 3: Emission values for two-or-three-wheeled vehicles

Air flow Q in m³/min	Permissible sound power level	
	18 months after notification of the Directive*	5 years after notification of the Directive*
Q≤5	101	100
5<Q≤10	102	100
10<Q≤30	104	102
Q>30	106	104

Air flow Q in m³/min	Permissible sound power level	
	from 1 April 1996	from 1 April 2000
Q≤5	97	95
5<Q≤10	98	97
10<Q≤30	100	97
Q>30	101	99

COMPRESSORS (84/533/EEC) (Sound power levels in dB(A)/1pW):

	Permissible sound power level	
	18 months after notification of the Directive*	5 years after notification of the Directive*
Lifting mechanism	102	100
Energy generator	Levels laid down in the Directive on power generators according to the power generated	
Assembly comprising lifting mechanism and energy generator	Highest values of the two components	

	Permissible sound power level	
	from 1 April 1996	from 1 April 2000
Lifting Mechanism (1) P≤17kW	97	95
Lifting Mechanism (1) P>17kW	100	97
Energy generator	Levels laid down in the Directive on power generators according to the power generated	
Assembly comprising lifting mechanism & generator	Highest value of the two components	

TOWER CRANES (84/534/EEC):

Table 4a: The present permissible sound power levels of compressors & tower cranes, (15) in comparison to the values suggested by H Frenking (16).

Nominal maximum welding current	Permissible sound power level	
	18 months	5 years
	after notification of the Directive*	
Not greater than 200 A	104	101
Greater than 200 A	101	100

	Permissible sound power level	
	from 1 April 1996	from 1 April 2000
	97	95

WELDING GENERATORS (84/535/EEC):

Electric Power (P)	Permissible sound power level	
	18 months	5 years
	after notification of the Directive*	
P ≤ 2 kVA	104	102
2 kVA < P ≤ 8 kVA	104	100
8 kVA < P ≤ 240 kVA	103	100
P > 240 kVA	105	100

Electric Power (P)	Permissible sound power level	
	from 1 April 1996	from 1 April 2000
P≤ 2 kVA	95	92
2 kVA < P ≤ 240 kVA	97	97
P > 240 kVA	99	99

POWER GENERATORS (84/536/EEC)

Table 4b: The present permissible sound power levels of welding generators & power generators, (15) in comparison to the values suggested by H Frenking (16).