NEW NOISE LEGISLATION IN ITALY

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1. INTRODUCTION

In 1991 the Italian legislation regarding noise was deeply renewed by way of two fundamental laws. The first law (1 March 1991) states the noise exposure limits outdoors and in buildings and gives technical guidelines for the related noise measurements. The second law (15 August 1991) states the noise exposure limits in the work place, gives technical guidelines for the related noise measurements and details the actions to be undertaken for the protection of the workers. These new laws, in line with the most advanced legislation of the main industrialized countries, are an important change in the traditional framework of Italian legislation, but some problems still persist, mostly connected with the practical applicability of some procedures specified in the new laws.

2. ENVIRONMENTAL NOISE

The importance of noise as a pollution factor has been acknowledged in Italy by way of some laws promulgated in the last years. The first step towards a new concept of noise was made with a law [1], largely based on the E.C.C. Directive 337/85 [2], stating that noise must be considered among the fundamental pollution factors when performing the environmental impact evaluation of any large project. Although this law applies only to a restricted class of projects, it is supported by technical procedures which have a general meaning [3]: the noise evaluation can be made by way of field measurements and mathematical models; the environmental noise maps must agree with the international standards I.S.O. 1996/1/2 [4, 5]. The application of the above-mentioned procedures is subordinate to knowledge of clear noise limits. Therefore, the second step was the promulgation of a law [6] the purpose of which is to assess noise limits outdoors and in building environments (with the exclusion of airports areas, which should be treated in a future specific law). With regard to the outdoor environment, this law prescribes the land classification in *acoustically homogeneous* areas, depending on their destination of use. Six kinds of land

areas are defined, and for each of them a maximum for the continuous equivalent A-weighted sound pressure level of noise (L_{Aeq}), in the daytime (6.00-22.00) or at night (22.00-6.00), is established (see tab. 1). Actually this subdivision in acoustically homogeneous areas does not yet exist; for its assessment the town council is in charge; in the meantime, a simpler classification scheme (unfortunately urbanistic rather than acoustical) and less restrictive limits are adopted (see tab. 2).

LAND AREAS	MAXIMUM L_{Aeq} dB(A)	
	DAY	NIGHT
1. PARTICULARLY PROTECTED AREAS	50	40
2. MOSTLY RESIDENTIAL AREAS	55	45
3. MIXED AREAS	60	50
4. AREAS OF INTENSE HUMAN ACTIVITY	65	55
5. MOSTLY INDUSTRIAL AREAS	70	60
6. EXCLUSIVELY INDUSTRIAL AREAS	70	70

Table 1. Land classification scheme and maximum sound levels allowed for outdoor noise.

LAND AREAS	MAXIMUM L_{Aeq} (dBA)	
	DAY	NIGHT
1. GENERIC AREAS	70	60
2. TYPE "A" AREAS	65	55
3. TYPE "B" AREAS	60	50
6. EXCLUSIVELY INDUSTRIAL AREAS	70	70

Table 2. Land classification scheme and maximum sound levels allowed for outdoor noise during the transition period. Type "A" areas: urban areas of historical, artistic or environmental importance; type "B" areas: with buildings over 12.5 % or more and with building density greater than 1.5 m^3/m^2.

The actual situation is such that even the maximum value of the temporary daytime limit, 70 dB(A), is often exceeded in all urban areas, mainly as a consequence of road traffic noise. But some resistance still persists against the classification of traffic noise as a specific source rather than a component of background noise; this is probably due to the knowledge of the dramatic difficulties connected with a strong attenuation of

traffic noise in Italian cities. Thus, the law is strictly applied only to factories, plants, etc., which often lie in zones where the sound level is close to the allowed limit, owing to the *background* traffic noise. For indoor environments, and in areas not exclusively industrial, the law establishes a *differential* criterion: the difference between *environmental* noise and *residual* noise (i.e. the sound levels with or without the noise source active) must be less than 5 dB(A) in the daytime or 3 dB(A) at night. When the noise source is outdoors, measurements shall be made with open windows. Nevertheless, a preliminary measure shall be made with closed windows to verify if the environmental noise level is < 40 dB(A) in the daytime and < 30 dB(A) at night: in this case, the noise must be tolerated. In a similar way, if the environmental noise with closed windows is > 60 dB(A) in the daytime or > 45 dB(A) at night, the differential criterion cannot be applied. As a consequence, in many buildings the differential criterion cannot be used against external noise sources. The law encourages the firms to present plans for the mitigation of their noise emissions; these plans shall be examined and eventually approved by the Regional Authorities, which moreover shall state guidelines for the presentation of similar plans by every municipality. Finally, the request of any permission to build a new industrial plant shall include an environmental impact assessment of noise. Unfortunately, this important planning scheme was cancelled by a sentence of the Constitutional Court (December 1991), owing to a conflict between Central and Regional Authorities.

3. NOISE IN THE WORK PLACE

The Italian situation regarding the exposure of workers to noise, lead and asbestos, has deeply changed since 15 August 1991, when the Italian Government adopted a new fundamental law [7]. With regard to noise, it is substantially inspired from the E.C.C. Directive 86/188 [8], but with some important changes and further specifications. The basic principle of the law states that "*the employer must minimize ... the risk due to exposure to noise by way of technical, organizing and procedural means, which can actually be carried out, preferring the intervention on the noise source*" (art. 41). This statement, oriented to the maximum safeguard of the workers, compels the employers to set up all the sound attenuations, whenever possible. The main topics of the new Italian law are detailed in the following points.

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1. The key parameter of the whole law is the noise exposure level (L_{EP}), computed from the continuous equivalent A-weighted sound pressure levels ($L_{Aeq,T}$) and from the actual exposure times of the workers to those levels.
2. Three limiting values are established for the L_{EP}: 80, 85 and 90 dB(A). Every time a higher limit is reached, more comprehensive actions against noise are required.
3. The risk due to impulsive noise is taken into account stating that the L_{peak} cannot have a value greater than 140 dB(Lin).
4. The exposure of workers to noise must be evaluated in every firm (art. 40). This principle will give rise to a thorough check, never attempted before, of the Italian situation.
5. It is clearly stated that the owners and/or the managers of every firm must minimize the risk for the workers due to noise exposure; actions carried out on noise sources must be preferred (art. 41).
6. The actions to be done when L_{EP} is greater than 80, 85 or 90 dB(A) are specified in the law.
7. A principle of responsibility is clearly established: the owners and the managers of the firm are responsible for the noise measurements in the work place, the medical test on workers and the sound attenuation techniques (of course the practical execution is required from experts in the field); the workers must follow the directives given by their managers, according to the law.
8. The workers can control that the safeguard procedures and devices be adequate.
9. A technical annex to the law details the measurement procedures; I.E.C. class 1 instruments are required, and every measured value must be given with the associated *random error* (Annex VI, 3.3).

The actions to be carried out when the L_{EP} reaches the stated limits are summarized in table 3. The introduction of such a new law, that supersedes some out-of-date acts and their related confusing interpretations, is of course positive. Nevertheless, some criticism should be made to some areas of the Italian text, which, far from being simple details, give rise to important practical consequences. First of all, six months, as prescribed by the law, are not enough to evaluate the situation of every firm in Italy, owing to the lack of technicians who can perform the evaluations. Moreover, the law does not explain what makes a qualified technician. The first action level is 80 dB(A): this may seem a good choice, compared to those adopted in other countries; at this level the actions to be carried out comprise mainly the information to the workers, the health control, etc. (see table 3). At a first glance, little attention is devoted to

the technical meanings for sound attenuation; indeed, there is an explicit demand for them only when $L_{EP} > 90$ dB(A) or $L_{peak} > 140$ dB(Lin), which are high values of exposure at which a percentage of the workers may have already suffered from hearing damage. But it should be kept in mind that further actions must be carried out when higher noise exposure levels are reached (see table 3), and in any case the above-mentioned basic statement (art. 41) holds: sound attenuations must be set up whenever possible, even if $L_{EP} < 80$ dB(A). It seems not acceptable the economic meaning (cost/benefits) that some firms give to the expression *actually carried out*, a restricted interpretation that would prevent the application of many sound attenuation devices.

I .	$L_{EP} < 80$ dB(A):
	. only basic recommendations must be fulfilled (the risk is considered null)
II .	$80 < L_{EP} < 85$ dB(A):
	. the measured L_{EP} shall be stored in a specific file
	. new measurements for changes in the working process
	. information to workers about hearing risks, prevention, health control, the result of the noise evaluation
	. health control on request
III.	$85 < L_{EP} < 90$ dB(A):
	. hearing protection shall be given to the workers
	. the workers must pass a health control
	. the workers must be informed about the correct use of hearing protections and of the noisy machines
IV .	$L_{EP} > 90$ dB(A) or $L_{peak} > 140$ dB(Lin):
	. adoption of sound attenuation systems (communication to Public Authority within 30 days)
	. the hearing protectors are mandatory
	. delimitation of places where $L_A > 90$ dB(A)
	. periodic medical control for every worker
	. updated files of exposed workers

Table 3. Action to be undertaken when the exposure of the workers to noise reaches the stated limits.

When the workers are exposed to variable noise levels, the resulting value of the L_{EP} is strongly dependent on the effective mean exposure times, but the law does not specify who shall declare these times. Although the request to the employer of such a declaration is becoming usual between the acousticians in charge of the measurements, the lack of any explicit procedure gives rise
to the risk of assigning a worker to the wrong class of noise exposure. Finally a comment about the *random error*: the new law states that any measured value must be given with its experimental error. This is a very remarkable feature, which should not be misunderstood by way of a strict interpretation of the text, i.e. demanding that every measured value be associated with its statistical uncertainty: in this case the sound measurements should be repeated many times for every measurement point; this gives a huge number of measurements, i.e. a meaningless waste of time, even in medium-size factories.

4. REFERENCES

[1] President of the Italian Council of Ministers, d.P.C.M. n° 377, *Rules for the environmental compatibility assessments ...*, 10 August 1988.
[2] E.C.C. Directive 85/337, *On the evaluation of environmental impact of some public and private projects*, 27 June 1985.
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[4] I.S.O. 1996/1, *Acoustics - Description and measurement of environmental noise. Basic quantities and procedures*, 1982.
[5] I.S.O. 1996/2, *Acoustics - Description and measurement of environmental noise. Acquisition of data pertinent to land use*, 1987.
[6] President of the Italian Council of Ministers, *Maximum limits to noise exposure in building environments and outdoors*, d.P.C.M. 1 March 1991.
[7] Legislative Decree n° 277, 15 August 1991.
[8] E.C.C. Directive 86/188, *On the protection of workers from the risk related to exposure to noise at work*, 16 May 1986.