

ACOUSTIC REGULATIONS AND PRACTICES IN FRANCE

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1. THE VARIOUS CATEGORIES OF NOISE EMISSIONS

The regulations on environmental noise protection in France cover four main categories:

- noise from so-called "ICPE" installations (installations classified for environmental protection). This is a list of installations that could present dangers for the environment, for air and water pollution, explosion or fire risks, etc.. These are mainly industrial facilities but also include livestock rearing and dangerous product storage installations. There are two sub-categories: installations that require an authorization to operate and those that are covered by a simple declaration to the authorities. In the first case, the decree of 23 January 1997 is the applicable statutory text, and the decree of 20 August 1985 in the second case (this covered both categories before 1 July 1997);
- neighborhood noise emissions which are governed by decree 2006-1099 dated 31 August 2006. This covers all the other sources of noise not included in the ICPE category. For instance wind farms, building equipment (air conditioning system, etc.) used in private or professional premises, sports and recreational equipment, certain industrial installations such as water treatment plants, and so on;
- noise from recreational events when they have to obtain an authorization from the authorities, such as open air concerts, car circuit racing, etc.;
- finally, the noise generated by transport infrastructures on land (road or rail) and in the air (aircrafts).

2. NEIGHBORHOOD NOISE AND NOISE FROM INSTALLATIONS CLASSIFIED FOR ENVIRONMENTAL PROTECTION (ICPE)

The acoustic criterion applied to ICPE installations and to the sources of neighborhood noise emissions is emergence E. This is defined as the arithmetic difference between the noise level with a particular source of noise (eg. a noisy installation), and the noise level without the particular source of noise. The texts differ slightly, essentially for historical reasons due practices that have changed with time. In the case of the neighborhood noise emissions, account has to be taken of the cumulated duration of the particular noise using a corrective term from 0 to 6 dB(A) and, since 2006, noise emissions generated by a professional activity by octave bands inside dwellings and dB(A) outside. This applies for instance to wind farms that are considered noise sources from a professional activity. In the case of the ICPE, the state of the installations representative of the noisiest configuration is defined.

In all cases, a distinction is made between nighttime and daytime with different requirements applied to each period. Corrective terms can also be used to take account of the impulse nature of the noise or the presence of marked tonality (ICPE).

The regulations define no particular requirement when the noise level is below 25 dB(A) inside dwellings or 30 dB(A) outside in the case of neighborhood noise and 35 dB(A) for an ICPE.

Lastly, although the Leq indicator is used for neighborhood noise emissions and ICPE that are subject to the declaration, other indicators can be used for ICPE installations that are subject to authorizations, such as the L50. Standard NFS 31010 is the reference for measuring environmental noise.

There is another important difference between the text governing neighborhood noise emissions and the text governing the ICPE subject to authorization. In the first case, this text covers the procedure for dealing with complaints, that is to say compliance with the legal requirements will be checked at the complaining parties' premises in the case of a complaint. When dealing with an ICPE that requires an authorization, this check consists in guaranteeing compliance with noise emissions in so-called "ZER" (regulated noise emission zones), including in areas which are not yet occupied by third parties but which are classified as building land on the date the ICPE receives the authorization to operate. The criterion of past performance does not therefore come into play regarding industrialists compliance with the regulations.

A distinction is also made between the concepts of administrative obligation (ie. compliance with the provisions of the decree of 23 January 1997 regarding the ICPE for instance) and the obligation to refrain from causing a nuisance.

This means that persons living close to an installation have to comply with their administrative obligations in order to be able to obtain satisfaction in the context of a civil procedure when the legal procedure concludes on the existence of a nuisance despite compliance with administrative obligations. On the other hand, if the complaining party moved into the neighborhood of an industrialist, the criterion of past performance will apply and the complaining party may not then request that a prejudice be made good.

A very important aspect is left almost entirely without any effective recommendations. This is the period of time during which the readings are taken and their representativity, whether for the residual noise level (installations shut down) or the ambient noise level (installations operating). Today however, it has to be said that statutory checks often consist of random sampling of "emissions" within an often scattered population, even if the period of the measurement (24 or 48 hours) is perfectly reasonable. This is all the more true as the distance between the point of the readings and the noise emitting installations increases.

For instance, below we give the results obtained from uninterrupted monitoring of the ambient level for 26 days, and 23 days monitoring of the residual level. The reading is taken at the boundary between the property of a complaining neighbour and a large industrial facility emitting very stable noise levels consisting of essentially ventilation and air handling equipment, but situated a few hundred meters away. The minimum and maximum variations noted between the $L_{aeq_{1h}}$ are around 15 dB(A) for both the residual noise level and the ambient noise level.

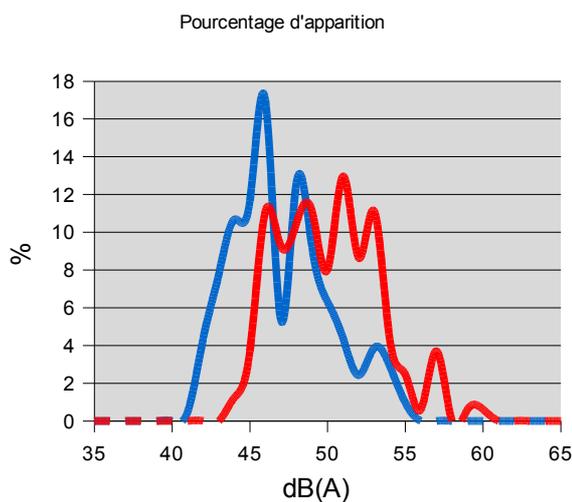


Figure 1 – Comparison between $L_{aeq_{1h}}$ measured between 7h and 22h, for ambient noise levels (in red, lasting 26 days) and residual noise levels (in blue, lasting 23 days)

The observation of the results in $L_{aeq_{7h-22h}}$, measured over a 26-day period (therefore giving 26 values for $L_{aeq_{7h-22h}}$), shows that the differences are much lower due to the period of integration (15 hours instead of 1 hour) that result in a smoothing of the results. However, there is a confidence interval of 95% of the mean value at approx. ± 3.7 dB(A) on the L_{aeq} results and approximately ± 5 dB(A) for the residual level (installations shut down). This difference suggests the confidence attributed to the emission value (ambient level – residual level) based on two values taken "randomly" can only be regarded as relative.

Table 1 – Ambient level, mean value and standard deviation of $L_{aeq_{7h-22h}}$ (lasting 26 days)

	L_{Aeq}	L₅₀	L₉₀
Mean value dB(A)	56.8	55.8	51.6
Standard deviation dB(A)	1.9	1.9	1.2

Table 2 – Residual level, mean value and standard deviation of $L_{aeq_{7h-22h}}$ (lasting 23 days)

	L_{Aeq}	L₅₀	L₉₀
Mean value dB(A)	52.4	51.0	45.6
Standard deviation dB(A)	2.3	2.5	2.5

3.SPORTS AND RECREATIONAL EVENTS SUBJECT TO AUTHORIZATION

In these cases, the authorities (mayor or prefect) define the conditions applicable to the event. This means that the event in question no longer comes under the neighborhood noise regulations. These events include dances, open air concerts, motorcar racing, etc..

However, premises that emit amplified music on a regular basis (musical bars, discotheques, general purpose halls, etc.) are subject to the requirements of decree 98-1143 dated 15 December 1998 which requires compliance with a level of noise emissions measured in dB(A) when they are not adjoining and in octave bands when adjoining the neighbours.

4.NOISE FROM LAND AND AIR TRANSPORT INFRASTRUCTURES

4.1Roads and railways

The concept of past performance is decisive for this category and the acoustic requirements are quantified in absolute values and not in relative values, such as emissions in the case of neighborhood noise and the ICPE.

Article 12 of the laws on noise, supplemented by decree 95-22 dated 9 January 1995, sets out the principles of protection from noise generated by buildings bordering infrastructure projects or existing infrastructures that are to be developed or modified. The decree of 9 January 1995 targets noise limitation from new surface transport infrastructures by applying levels called "annoyance indicators". These are defined in the decree of 5 May 1995 for roads and the decree of 8 November 1999 for railways.

Any new or significantly modified infrastructure (increase of more than 2 dB(A) after the works) is not permitted to exceed set noise impact thresholds at the frontage of neighboring buildings either at night or during the day. The infrastructure operator has to meet a so-called "results obligation": which in practical terms means that he has to provide anti-noise protection in compliance with the regulations.

Compliance with maximum acceptable noise levels is mandatory over the life of the infrastructure.

The targets to be achieved are determined by the decree of 5 May 1995 for roads and decree of 8 November 1999 for the railways. For instance, in the case of housing, the maximum noise generated by a new road situated 2m upstream of a frontage to be protected will be 60 and 55 dB(A) respectively during the day and at night, if the dwelling is initially in a "ZAPM" (Preexisting Moderated Ambient Noise Zone) and 65 and 60 dB(A) in other cases.

The ZAPM criterion is defined as follows: LAeq (6h-22h) < 65 dB(A) and LAeq (22h-6h) < 60 dB(A).

It can be seen that the concept of preexisting moderate ambient noise is relative. This means that when a new road is built in open countryside, the noise level experienced by residents in their garden can increase from 25 to 55 dB(A) at night, without any compensation being due.

When it is predicted that the statutory obligations will be exceeded, the operator has a choice between protection on the emission side (acoustic screens, earth barricades) or on the reception side by proposing improvements to the insulation of the exposed building frontage to improve on the otherwise permitted threshold. The solution is generally based on technical and financial considerations.

However, these compensations can only be imposed if the criterion of past performance can be established in favour of a neighbour.

For a building in a sector affected by the noise of an existing transport infrastructure, the decree of 30 May 1996 details the requirements regarding the insulation of new building frontages, with a minimum of 30 dB(A) relative to a road noise. Of course, it is for the owner of the future building to ensure that the minimum performances are effective. This text is currently being revised by the French authorities.

4.2 Airports and aerodromes

The maximum noise thresholds cannot apply to the noise generated around airports and aerodromes.

Town planning law 85-696 of 11 July 1985 stipulates that noise exposure maps ("PEB") have to be established in the vicinity of most aerodromes (approximately 250). This town planning document is designed to allow the controlled development of towns without exposing new populations to noise. Decree 2002-626 of 26 April 2002 establishes the conditions for the preparation of the PEB.

The PEB fixes the conditions for use of land that is exposed to aircraft noise nuisance for the next 10/15 years. Aerodrome noise are zones classified high noise

zones, known as A and B, zones of moderate noise, known as C and if necessary D. There are specific regulations, restrictions or prohibitions applicable on each zone.

Since 2002, the Lden noise index is used to define the PEB noise zones.

The PEB has to take into account all the development and use assumptions for the airport in the near, medium and long terms, the PEB constituting the "envelope" of the curves prepared for the three study horizons. The relevance of these assumptions is reviewed every five years by the Environment Consultative Commission.

So-called "Noise Annoyance Maps" ("PGS" – Plan de Gêne Sonore) establish zones that are eligible for the application of noise mitigation measures through subsidies and grants to residents in the neighborhood of aerodromes. These subsidies are financed from the tax on airport noise nuisance (TNSA - Taxe sur les Nuisances Sonores Aéroportuaires), which is collected from the airlines by the airport operators.

Decree 2002-626 of 26 April 2002 sets out the conditions for preparing the noise annoyance maps. As to the PEB and since 2002, the Lden noise index has been used to define the PGS noise zones.

On a request from the Ministry of Transports, a working group has been set up to examine more closely the method of applying the procedures concerning the noise exposure maps (PEB) and the noise annoyance maps (PGS), and even the possibility of completely merging the two systems.

In parallel with the creation of these plans, airports may undergo an evaluation of the various measures in order to limit the noise nuisances (as covered by article R. 227-9 of the civil aviation law. The information to appear in the evaluation is set out in this article of the civil aviation laws for the introduction of operating restrictions associated with a noise on certain aerodromes and detailed in the Order of 10 November 2004.

5. STRATEGIC NOISE MAPPING

Lastly, the final element in the range of statutory texts is European directive 2002/49/CE of 25 June 2002, transposed into French law by articles L. 572-1 to L.572-11 of the environmental laws, decree 2006-361 of 24 March 2006 and the two decrees of 3 and 4 April 2006. This requires the preparation of strategic noise maps and the adoption of action plans called in the French texts "Plan de prévention du bruit dans l'environnement" (environmental noise prevention plan) for large conurbations and major transport infrastructures (main roads and railways, large aerodromes). These strategic noise maps to a certain extent constitute diagnoses of the noise exposure of the populations over an extended area, and have then to be applied as the foundation for preparing action plans, the main aim of which is to reduce the noise exposure of populations when this is considered excessive. Two dates have been defined for preparation of strategic noise maps: mid-2007 for large infrastructures, mid-2012 for the others.

