

The Introduction of an Environmental Noise Management System.

**In Accordance with the Priorities of the
“Sustainable Development Strategy: Agenda 21”**

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1. Introduction:

Noise pollution is considered to be one of our biggest environmental problems, given that it not only causes a deterioration of the environment but is also a cause of physical and psychological disorders in those people who are subjected to certain noise levels.

The production of noise is inherent to most activities and is, indeed, related to the “life” of a community. Thus, the idea of an environment without noise is essentially contrary to social activity. It is for this reason that we have to find a balance between the pollution levels which produce damage among a part of the population and the quantity of noise necessary so that social activity can be carried out. This balance between the noise level collectively produced as a part of our normal life and the level which causes “damage” to the members of society will not be the same for all communities and will depend on the peculiarity of each social group (community). This is the subject matter of **Sustainable Development Strategies** described in the document entitled “**Agenda 21**”.

The quality of life which each Local Government provides is highly conditioned by the level of noise which its citizens suffer. This factor will condition the evaluation which the citizens make of their place of residence. At present the most important factors, among others, are the geographical situation and communication links but with the possibility of working from home and the high mobility of the workforce which the new telecommunication systems allow will mean a change in the relative importance of the different factors.

Without doubt the sensitivity of the citizens with regard to the problems of noise pollution is growing.

In the E.U. Green Paper, “Future Anti-Noise Policies” (1996), it is recognised that about 20% of the inhabitants of the E.U. suffer levels of noise which experts in the health sector consider unacceptable. This affects 80 million people. Another 170 million live in zones where noise causes important health problems during the day.

The E.U. Green Paper emphasises two essential functions within the Administrations with reference to:

- The obligation to inform the public about the noise levels to which they are subject.

- The taking of measures to reduce the levels of noise emitted by the different sources.**

From the document: “Sustainable Development Strategies: Agenda 21” in the appendix regarding the specific environmental priorities, “Priorities regarding Pollution, Waste and the Urban Environment” we can read the following:

“A special programme of action concerning the environment should be instigated.....in collaboration with the Local Authorities.....whose priority should be towards actions which favour the diagnosis and municipal environmental management. In this programme special attention will be paid to the problems derived from air pollution, noise pollution,.....”.
“The training and information programmes regarding everything related to pollution and waste are fundamental in order to promote changes of attitude....”.

These observations coincide exactly with those expressed in the E.U. Green Paper, where **training and information** take priority over **inspection and sanctions**.

Moreover, the Spanish legislation recognises in its Constitution (article 45) the right of the Spanish people to live in an environment with an adequate quality, and which obliges the Government to abide by the following definition:

Quantifiable environmental objectives which are at the disposition of all the interested parties.

The corrective measures necessary for the obtention of these objectives.

The monitoring and control systems necessary to know the degree of observance and non-fulfilment of the regulations which occur with respect to the quality guidelines.

Spanish legislation confers official responsibility for “control and prevention” of noise on the Autonomous Regions.

It is, therefore, necessary that the Local Councils adopt those measures appropriate (environmental policy) in order to know the present situation with regard to the problem and subsequently define their objectives which, by means of pertinent measures, will be carried out in a reasonable period of time. (We must bear in mind that the values of the parameters which define the quality of the environment will depend on the particular characteristics of the region). As a consequence we may conclude that it is necessary, and at the present opportune, to design a system which allows us to know the real situation of the environment with regard to those aspects related to noise in each individual community, to define (or complement) the most adequate environmental policy, to design a control and anagement system which permits the adoption of the necessary corrective measures and to ensure their fulfilment.

2. Environmental Quality

We have already commented that nowadays the awareness of the people with respect to the environment in which they work and live is growing and the arguments used are becoming more and more familiar: the nearness to nature, natural comfort, a clean environment, etc. The tendency is for “environmental quality” to play an ever more important part in the development and comfort of our lives.

The question of quality has been embraced by industry ever since the industrial revolution, not only in order to offer consumers standardised products with identical characteristics but also to be able to favour interchangeability within the production process and having different lines in different places without affecting the quality of the final product. This is the definition of “procedures” adjusted to the appropriate regulations (external and internal) for the conversion of components and manufacturing processes, subject to “procedures” of monitoring and control which ensure and certify the final quality. These processes are regulated by the Norms ISO 9000.

These procedures to guarantee manufacturing quality have been transferred to “environmental quality” via the Norms ISO 14000, initially with the intention that the companies guarantee that the industrial procedures used are “environmentally friendly” and thus obtain diplomas for their non-polluting companies.

The ISO 14000 Norm includes the following sections:

- The definition of the desired environmental quality (or Norm to be fulfilled).
- The establishment of correct procedures.
- The definition of monitoring and control procedures.
- The establishment of corrective methods for deviations from the desired standards.

These tasks define an **Environmental Management System** whose mission is to guarantee the quality of the environment.

These control procedures can be transferred directly to local and regional management of the environment since it will be the monitoring and control tool which the regulations need and which have, among others, the following aims:

- To ensure the quality of the urban environment with respect to noise.
- The regulation of the sound levels as a result of whatever cause.
- In short, to establish: **quantifiable environmental objectives** which lead to the establishment of an environmental policy with the aim of maintaining a specific **environmental quality** in the Municipality.

Proceso Digital de Audio proposes the implementation of an environmental management system based on the SDR-100, EQD-100 and EQD-50 SRE devices and their management and automatic data recording program “GestionSDR”. The automatic data recording is carried out by means of the “intelligence” of the terminals using, as a transmission back up, technologies which utilise the facilities of the GSM network (SMS). All the data collected will be processed by means of the appropriate software and directed in two ways:

1. Up to date information for the competent authorities regarding each noise focal point.
2. **The integration of the data by means of GIS systems and the generation of Community noise maps, available for inspection by the public at large at a Web site to which any person may gain access and visit the maps of the Region in general and each specific Local Authority area.**

This project will consist of the following stages:

- An analysis of the sources of noise pollution in the cities and natural spaces of interest, paying special attention to the impact on the environment.
 - The definition of those environmental quality aims feasible in the short term. The environmental norms.
 - The definition of the monitoring system and the corrective mechanisms.
- Implementation of the system.

3. Objectives.

The project has as its objectives:

- The analysis of the noise pollution in the Autonomous Community, the fixing of the values advisable for the definition of the environmental quality with regards to noise within each Area, whether it be urban or a special protection area, taking into account their particular characteristics for the drawing up of an environmental policy.
- The specification of a continuous monitoring system for the above, the implementation of it and the recommendation of an operating methodology with quality normatives internationally accepted and compatible with local and higher level legislation. (Environmental Management System).

The system will be capable of measuring continually the noise pollution levels at specified points, transferring this information to the Monitoring Centre (MC), where the corresponding data base will be brought up to date.

The Regional and Local Technicians (RLT) will be able to access this information by means of graphical interfaces and to monitor the history of all the measuring points. The MC will have at its disposal software tools in order to publish reports for the Regional and Local Authorities. Likewise, it will have a plan so that the compilation of data may be processed with the aim of building an active noise map by means of the integration of geographical information systems to which can be added the characteristics of the propagation path between the noise sources and the receivers using specific software in such a way that the noise map is continually updated.

Thus, we have at our disposal the readings of the present situation, updating the figures in terms of the ups and downs of the sources in such a way that this information can be made available to the public via convenient backups, including Web sites accessible on the internet and providing whatever other information we might deem necessary.

4. Implementation.

The system will concur with the following scheme:

Discos/Pubs
Activities
Traffic
Hotels
Exteriors

GSM Network

Monitoring Centre

GSM Network

Communication equipment

Data Bases Data processing

Internal information system

Web

The implementation of the system will be carried out in the following stages:

1. A general study of the noise problem in the area and location of the relevant sources. A study of its impact on the environment. Analysis of the requirements of the administration and a detailed design of the system.
2. A study of the noise sources and measurements in situ for the correct diagnosis and a study of the corrective measures.
3. Implementation of the basic system: Measurement, communication and data base equipment.
4. On line data model: Dynamic noise maps. Integration of GIS and planning applications.
5. Presentation via internet: Web pages for public and private access.
6. Maintenance and updating.

The system thus constructed will have the advantage of carrying out all the measurements directly at source to a high level of accuracy with the consequent saving in detectors, obtaining greater precision as a result of decreasing the dependency on measurement points. The values available in order to visit the maps are, thus, those obtained by means of the algorithmic calculation of the transmission of the sources.

5. Conclusions

With the implementation of our system we will achieve at the end of the project:

1. The establishment of an environmental policy based on real knowledge of the present-day situation with the definition of feasible and sustainable objectives as well as the necessary corrective measures to deal with the problem.
2. The provision of a **monitoring system** for the Region which would provide a guarantee of the **quality** and the degree to which the environmental policies have been fulfilled.
3. The provision of an **inspection system** which would allow the Local Authorities to carry out a systematic inspection of those activities associated with noise without the necessity of having to wait for complaints from the public, with all the corresponding advantages.
4. The provision of an **active noise map for all the region** with the possibility of presenting it by means of information technologies, immediately available to all concerned in an efficient manner via the internet in such a way that we could easily access the Regional noise map.