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## **Previous Attempts to Develop, Implement and Enforce a U.S. Noise Policy**

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### **Abstract**

The change from propeller aircraft to jet engines in the 1950's provided much of the impetus for development of national (federal) noise policies regarding noise from aircraft and other environmental noise sources in the U.S. Through the 1970's and early 1980's, the U.S. Environmental Protection Agency and other national organizations participated in the development of a series of federal noise regulations and guidelines. This paper will briefly review the overall noise policy approach implemented in the U.S during this period of time. It will briefly describe the major noise policy documents produced in the U.S., including both emission regulations and immission guidelines, and will provide an informal assessment of the effectiveness of these documents. A distinction will be made between the usefulness of the concepts developed in the U.S. and how well they were enforced over time. Both the strengths and weaknesses of the historical U.S. noise policy approach will be described in an effort to learn from past experiences in developing concepts for a new national unified noise control policy.

### **1. Introduction**

There has been a growing acknowledgement in the U.S. in recent years that major improvements in national noise control policies are needed to develop a new strategy for controlling environmental noise exposure, including possible changes in federal agency roles and responsibilities. It would be desirable to unify all U.S. noise policies under one concept that coordinates the activities of the various federal agencies – a Unified National Noise Control Policy.

From the community exposure (immission) perspective, previous studies in the United States show large numbers of the population exposed to excessive noise levels similar to those found for Europe. The best estimates in the U.S., based on published studies, are as follows:

- In 1974, the U.S. Environmental Protection agency (EPA) estimated that nearly 100 million Americans lived in areas where they were exposed to exterior noise levels exceeding 55 dB(A), the noise limit identified by the EPA that same year as requisite to protect public health and welfare [1].
- In 1990, it was estimated that 16.2 million people in the U.S. could be exposed to daytime community noise levels as high as 85 dB(A)BBN, Inc. [2].
- In 1990, the total number of people in the US living in communities with exterior noise levels above 55 dB(A) was estimated to be 138 million. Of these, 25.4 million were subject to a noise level above 65 dB(A) and 1.4 million to a noise level above 75 dB(A) [3].

Since these studies were completed, the situation with respect to community noise has become worse. Although recent studies of noise exposure in the U.S. are lacking, it is well known that noise levels are directly related to population density, and the urban population is increasing at roughly twice the rate of the non-urban population in the United States [4]. In addition to estimating community noise exposure, BBN [2] estimated that 9.2 million workers had daily noise exposure of 85 dB (A) or higher. The Occupational Safety and Health Administration (OSHA) and the National Institutes of Health (NIH) have also provided data on occupational noise exposure. OSHA estimated that 7.9 million US workers in the manufacturing sector were occupationally exposed to daily noise levels at or above 80 dB(A) [5]. More recently, NIH found that "... more than 20 million Americans are exposed on a regular basis to hazardous noise levels that could result in hearing loss" [6]. A very conservative estimate, based on data provided by the National Institute of Occupational Safety and Health (NIOSH), OSHA and other organizations, is that workplace noise could cost U.S. society as much as \$2 billion a year for occupational hearing loss.

According to the World Health Organization (WHO), "In contrast to many other environmental problems, noise pollution continues to grow and it is accompanied by an increasing number of complaints from people exposed to the noise." [7]. Both community and occupational noise exposures lead to a wide variety of negative impacts on people. Without a Unified National Noise Control Policy, noise exposure and its associated human health problems and costs can be expected to continue to increase in the future, especially in our larger cities.

From the product (source) emission noise control perspective, U.S. manufacturers are already being impacted by the many new product emission standards being promulgated by the European Commission (EC) for the European Union (EU). The new EC emission requirements will constitute not only a barrier to international trade, but will threaten the existence of many US companies and their products. Forcing U.S. companies to quickly make significant changes to the performance, design, and manufacture of their products because EC requirements on radiated noise will put them at a severe disadvantage. The EC noise rules may be used to impede or block the import of goods from US companies. In global markets, size and market share become paramount for survival. Companies that lose market share will not have the resources to develop

new products and market the products they do have. The American industries that make most consumer products are woefully unprepared to deal with the engineering and manufacturing issues involved in making their products meet the EC noise requirements. The EC regulations for some products are so stringent that totally new designs will have to be developed. The engineering for reduced sound does not exist in these companies. American companies will need the technical knowledge, designs, and trained personnel to innovate and build products that meet noise requirements. Many industries do not have experience in dealing with noise issues. The EU has major research organizations (e.g., CETIM and the Fraunhofer Institutes) and universities who are supported by government and industry to provide the technical infrastructure. The U.S. must develop a Unified National Noise Control Policy with a research component that will provide the basic technical support to industry through research, education, and technology transfer in the product noise arena.

Before any new ideas are considered for how the U.S. national noise control policy might be improved, it is important to see what lessons we can learn from previous efforts. The remainder of this paper provides a brief overview of the history of the development of U.S. national noise control policies, and offers some thoughts for consideration concerning the strengths and weaknesses of previous efforts.

## **2. U.S. Noise Control Policy History**

Firstly, it is important to understand that there was no logical, organized plan that was developed upon which to base the U.S. noise control policy. This is not meant as a criticism, however. As with all other countries who have developed their own noise control policies, the U.S. approach was developed because the Congress responded to individual topics as they rose to attention at the national level. The result of this typical development history, however, is that the U.S. has hundreds of uncoordinated laws, regulations, guidelines, and national Standards concerning noise issues. Some of these documents are outdated and lack an adequate, up-to-date technical basis. Some major environmental noise laws are not being enforced, and there are sometimes important, conflicting differences between the policy documents from different federal agencies. A special volume of the Noise Control Engineering Journal (NCEJ) provided a collection of the Invited Papers, “Noise Control – Where Do We Stand Today” [8], from a special session at the 129<sup>th</sup> meeting of the Acoustical Society of America in Washington, D.C in 1991. A second special volume of NCEJ published the Invited Papers from the special session on “Noise Policy – Is Noise Policy a Global Issue, or is it a Local Issue” [9] at the INTER-NOISE 99 Congress In Ft. Lauderdale, Florida.

Below is a short synopsis of the chronological development of various U.S. Government laws and regulations, and formal guidelines. The complete version of this database, including listings of national noise Standards and selected technical documents, can be found on the INTER-NOISE 2002 CD<sup>1</sup>. The following is a listing of a few of the most important noise control policy

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<sup>1</sup> The full Excel database from which this partial listing of noise policy documents was extracted can be found using the link on the “Welcome” page of the INTER-NOISE 2002 CD ROM. It can also be accessed directly from the CD ROM root directory under the file name “US Noise Policy History.xls”.

documents and significant events that have been part of the development of current U.S. national noise policies, with comments on a few selected items

- 1949: U.S. Congress - Housing Act of 1949 (Public Law: PL 81-171)
- 1958: U.S. Congress - Federal Aviation Act of 1958 (Public Law: PL 85-726)
- 1968: U.S. Congress - Aircraft Noise Abatement Act of 1968 (49 USC 44709, 44715)
- 1969: National Environmental Policy Act of 1969 (Public Law 91-190, 83 Stat. 852). This Public Law provided much of the legal basis for an emphasis on community and other environmental noises as national issues. It established the criteria under which an environmental impact analysis would be required to be performed before major, federally-funded development projects can be approved.
- 1970: US Congress - Noise Pollution and Abatement Act of 1970 (PL 91-604; 84 Stat. 2709; 42 USC 7641-7642)
- 1972: U.S. Congress - Noise Control Act of 1972 (NCA) (PL 92-574; 42 USC 4901-4918, 49 44709, 44715; as amended by the Quiet Community Act of 1978 (Public Law: PL 96-609)). The purpose of NCA 1972 was to allow the assignment of responsibility for noise control policies across federal agencies, particularly the Environmental Protection Agency. NCA 1972 is perhaps the most controversial of all historical U.S. noise policies, and can be deemed both a success and a failure in various ways. The strengths and weaknesses of this Public Law have often been debated and commented upon (e.g., see Shapiro [10] and the report on the 1991 Symposium on “Combatting Noise in the ‘90s: A National Strategy for the United States” [11]). Finegold [12] also makes the case that the major problem with NCA 1972 was that there was an inefficient assignment of responsibilities for development and implementation of national noise control policies, and an overly expensive legal mechanism established regarding enforcement of this statute. That article also makes the case, however, that some of the basic concepts of NCA 1972 might still be worth preserving, because correcting the problems with the Public Law would be easier than asking Congress to sponsor the development of a whole new round of national noise policies.
- 1973: Environmental Protection Agency (EPA) - Product Noise Labeling (40 CFR 211)
- 1973: Federal Aviation Administration Noise Standards: Aircraft Type and Airworthiness Certification (14 CFR Part 36)
- 1974: Environmental Protection Agency (EPA) - Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (EPA “Levels Document”, EPA Report No. 550/9-74-004)
- 1974: Environmental Protection Agency (EPA) - Identification of Products as Major Sources of Noise (39 Fed. Reg. 22297)
- 1977: National Research Council (NRC) - Guidelines for Preparing Environmental Impact Statements on Noise (Report of CHABA Report of Working Group 69)
- 1978: Quiet Community Act of 1978 (Public Law: PL 96-609). The Quiet Communities Act of 1978 amended portions of the 1972 Noise Control Act to require coordination between federal agencies on noise control. It was intended to speed up FAA response to noise regulations proposed by the EPA and requires the FAA to provide the public with a detailed analysis of EPA proposals.

- 1979: Federal Aviation Administration (FAA) - Aviation Safety and Noise Abatement Act of 1979 (Public Law: PL 96-193)
- 1980: Federal Interagency Committee on Urban Noise (FICUN) - Guidelines for Considering Noise in Land Use Planning and Control (U.S. Government Printing Office Report #1981-337-066/8071)
- 1981: The cessation of funding for the EPA Office of Noise Abatement and Control (ONAC) in 1981 was a defining point in the history of US environmental noise policy, leading to a virtual stoppage of the development of new noise regulations. The Noise Control Act (NCA) of 1972, which established EPA ONAC, was never rescinded after ONAC funding was abolished, but it is not being implemented or properly enforced either. Maling [13] presented a review and insightful discussion of the major activities of EPA from 1972 to 1982, culminating in this historic cutting of federal funds.
- 1982: Environmental Protection Agency (EPA) - Guidelines for Noise Impact Analysis (Report 550/9-82-105)
- 1985: Department of Housing and Urban Development - The Noise Guide Book (HUD 953-DPC)
- 1985: Federal Aviation Administration (FAA) - Airport Noise Compatibility Planning (14 CFR Part 150)
- 1990: U.S. Congress - Airport Noise and Capacity Act of 1990 (ANCA) (PL101-508; 49 USC 47521–47533)
- 1991: There was an effort by the Administrative Conference of the United States in 1991-92 to revive the dormant Noise Control Act, but Congress did not enact the Administrative Conference recommendations. The legal discussion section of the Administrative Conference report by Shapiro [10] makes the case that, arguably, the major flaw with the NCA of 1972 was that parts of its language made it virtually impossible to enforce, even though the basic noise policy concepts were relatively sound.
- 1997: Federal Highway Administration (FHWA) - Procedures for Abatement of Highway Traffic Noise and Construction Noise (23 CFR 772); based on the 1995 FHWA report, “Highway Traffic Noise Analysis and Abatement Policy and Guidance” .
- 1998: Federal Railroad Administration (FRA) - High-Speed Ground Transportation Noise and Vibration Impact Assessment (Final Draft, Report No.293630-1)
- 1999: Federal Energy Regulatory Commission (FERC) - Revision of Existing Regulations under Part 157 and Related Sections of Commission's Regulations under the Natural Gas Act (18 CFR Part 157.206(d)(5); Docket No. RM98-9-001; Order No. 603-A)
- 2000: Federal Aviation Administration (FAA) - Aviation Noise Abatement Policy 2000 (Docket No.30109, Federal Register 65(136))

### **3. Assessment of Current Status**

For much of the past 40 years, the U.S. was considered to be a world leader in the development of national noise control policies. The philosophy and technical foundation of U.S. noise control policies has been considered as a model to be emulated by other countries. However, over the past 20 years the U.S. has not been able to maintain its preeminence in this area. There are many reasons why this is so, including competition with other national programs and changing concepts of the role of the federal government. Thus, U.S. noise control policies are sorely in

need of revision and updating. Programs are not adequately coordinated among the various federal agencies involved with noise issues and there are many discrepancies in exposure criteria and technical noise control approaches between the policies of these agencies. In contrast to the U.S., individual countries in Europe, the European Union, and Japan, for example, are all making rapid progress on implementing modern noise control policies.

It is not possible to summarize all of the successes and failures of U.S. noise policy in this paper. However, the following comments can be made concerning two major programs: the Noise Control Act of 1972 and the Federal Aviation Administration's (FAA) program to reduce aircraft noise. An edited summary of the remarks before the INTER-NOISE 82 Congress by a key member of the EPA office responsible for the implementation of NCA 72, Henry E. Thomas, was published in *Noise/News* (1982, No. 5) and described again by Mailing [13]. Mr. Thomas, then assistant secretary for international affairs of the U.S. Department of Energy, identified two actions before the passage of the act that had a major impact on the implementation of the Act:

- There were no specific requirements for ambient noise standards for airports.
- In order to negate local noise ordinances, language was inserted into the act on behalf of interstate railroad and trucking interests that required the Federal Government to regulate the facilities and equipment of carriers engaged in interstate commerce.

He also said that no one anticipated the amount of work required to develop a Federal regulation related to noise, and that nothing will happen if a program is to require a minimum burden on industry. He stated that the public must be well-educated about noise issues to have a successful long-range program. Also, in his opinion, State and local governments must be willing to devote resources to support a noise control program, but he identified the "Criteria Document" and the "Levels Document" as two of the most important parts of the program, and called it a job well done.

The FAA's aircraft noise program is also controversial. A great deal of progress has been made over the years in control of the noise emissions of aircraft, and some consider this to be one of the best successes of U.S. national noise policy. According to Willshire & Stephens [14, p. 21], "The history of progress of noise reduction technology is impressive with over 20 dB of progress since the introduction of the first generation of jet propelled transports". On the other hand, Elliot Cutler, a Washington attorney, has characterized the FAA's program as a policy failure, stating that "The federal government has ignored the lessons of other environmental regulatory regimes that have worked reasonably well and instead has permitted an industry to largely regulate itself – the only major polluting industry in the United States that still is allowed to do so" [15]. In Cutler's opinion, the government ignored the lessons learned from regulating pollutants other than noise and allowed the noise industry to regulate itself. He characterized the FAA as a client-oriented agency, and pointed out that the Noise Control Act of 1972 essentially allowed the FAA to control aircraft noise emissions. Thus, he said, the progress in reduction of aircraft noise emissions has been technology driven rather than technology forcing. The Congress, he said, gave the FAA power to almost eliminate local constraints, and he characterized the Airport Noise and Capacity Act (ANCA) as a ruse and a case of "midnight enactment." Part 161 of ANCA, he said, limited the authority of airport proprietors to do what they had been doing. The FAA, he said, will not tolerate the (beneficial) actions of the 1970s and

1980s, and characterized European regulatory agencies as being much better at balancing the needs of all interested parties.

Overall, it is apparent that there are many critical issues that need to be addressed if the U.S. is going to make any progress in the near future on updating and revising its national noise policy, including the following:

- What should be the role of the various federal agencies such as the Environmental Protection Agency, the Department of Transportation, and the Department of Commerce? What is the best way to integrate the regulation development function of federal agencies with their potential technical support and guidance roles? Is it possible to develop a Unified National Noise Control Policy that addresses all noise sources in a coordinated fashion across the various federal agencies?

- What new concepts for noise control policies can be developed to facilitate the vertical coordination between various national, state, and local agencies?

- What is the best way to integrate emission and immission noise criteria and environmental impact analyses?

- Can Congressional or Presidential action resolve the problem concerning the lack of enforceability of the Noise Control Act of 1972 or will a whole new set of Congressional laws be required?

## **4. Conclusion**

After being one of the world's leading countries in the noise control policy field, especially for environmental noise control, the U.S. national noise policies are sorely in need of revision and updating. It is hoped that the INCE/USA Study Group on National Noise Policy, led by Dr. Bill Lang and Dr. Leo Beranek, will be able to generate new, more practical concepts for noise control policies and will be able to coordinate the activities of the many constituencies that must be involved if this is to happen. The special sessions during INTER-NOISE 2002 which describe the efforts of this group seems like an excellent starting place. The noise control engineering community has much to offer in support of new policy development efforts and the INCE/USA Study Group is already making good progress. Let us hope that this work continues to a successful conclusion.

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