

## Progress on development of noise policies from 2003-2008

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### INTRODUCTION

The purpose of ICBEN Team 9, Noise Policy is to promote and coordinate the dissemination and utilization of scientific knowledge about the effects of noise, especially as provided by the various ICBEN International Noise Teams (INTs), as scientific support to world-wide noise policy initiatives. These initiatives include activities intended to develop up-to-date noise policies, including noise regulations, guidelines and Standards. The ICBEN 2003 Congress was held in Rotterdam, the Netherlands, In addition to the 2003 *Proceedings* CD-ROM, overviews of that Congress have been published by Finegold et al. (2003) and Finegold (2004) for additional background materials. Since the last ICBEN Congress, there has been continuing progress on noise policy development around the globe, supported by the many improvements in available scientific data being reported at the current ICBEN 2008 Congress by the various ICBEN INTs. In addition, from 2003-2008 many national and international scientific conferences and workshops have provided forums for the discussion of a wide range of both noise research and noise policy topics, including progress on both noise source control (emission) and noise receiver (imission) issues. Reviews of progress during the past five years on noise emission topics can readily be found in other sources, such as the web site of the Environmental Noise Program of the European Commission (EC) at: <http://ec.europa.eu/environment/noise/sources.htm>, which lists the existing EC directives relating to noise sources. Because the emphasis of ICBEN is on the **effects** of noise, however, this paper focuses on the noise imission arena.

### EUROPEAN UNION – PROGRESS SINCE PUBLICATION OF THE EC ENVIRONMENTAL NOISE DIRECTIVE

Since the publication of the European Commission Environmental Noise Directive (END) in 2002, the European Union has vigorously pursued an active research program on various environmental noise topics and continued to provide evolving guidance on implementation of the END. The EC Environmental Noise web site (<http://ec.europa.eu/environment/noise/home.htm>) provides a series of related documents describing their progress. The bulk of the emphasis in the past five years has been on finalizing details of the required noise exposure modeling program for agglomerations (i.e., large urban areas with populations of over 100,000 people) and on development of Local Action Plans, both of which are required by the END.

Since the last ICBEN Congress, the EC has also produced additional documents, mainly EC Position Papers, on various specific environmental noise policy topics such as noise metrics and indicators, noise computation methods, the economic valuation of noise, night-time noise and sleep disturbance, environmental health indica-

tors, environmental impact assessment and public participation in this process, spatial information infrastructure, best practices for noise modeling, railway noise, and have continued to support technical publications on both community annoyance and sleep disturbance as these relate to noise policies. In addition, considerable effort and resources have been committed to development of the creation of a [Noise Expert Network](#), whose mission is to assist the commission in the development of its noise policy. All of these European Commission documents may be obtained from their environmental noise web sites.

## **THE UNITED STATES**

Very little progress on developing new noise policies has occurred in the past five years in the U.S., despite a strong interest in these activities within the scientific community and by the public. The best progress that can be reported has been the formation of several study groups looking at the needs and potential approaches for new national-level noise policies, continuing discussions about the appropriate metric for exposure to occupational noise, and the formation of a new study group looking at the possibilities for encouraging development of a national education and awareness program on the effects of noise and potential noise control options in communities.

## **JAPAN**

Few changes in national noise policies have likewise been seen in Japan during the past five years. The difference between Japan and the U.S. is that Japan has been involved in a rigorous and thorough reconsideration of its current environmental noise policies recently five years and significant changes are expected in the near future. For example, in the noise metrics arena, Japan is seriously considering changing from its current use of WECPNL (using the Japan version) to the use of an A-weighted long-term average cumulative noise metric, such as some version of an LEQ-based metric. Their goal for this effort to update their noise policies is to develop a comprehensive, unified approach to describing exposure to environmental noise. These efforts are commended and Japan will hopefully be successful in their noise policy modernization program soon.

## **HONG KONG**

For a large, congested urban environment, the government of Hong Kong has maintained an aggressive and comprehensive set of noise policies for some time and has made continued progress over the past five years. An overview of the Hong Kong program on noise pollution and noise control may be found at: [http://www.epd.gov.hk/epd/english/environmentinhk/noise/noise\\_maincontent.html](http://www.epd.gov.hk/epd/english/environmentinhk/noise/noise_maincontent.html). Specific issues addressed by the Hong Kong government include aircraft noise, highway noise, construction noise, building codes, a noise ordinance, and urban planning. Without a strong set of national level noise policies in place, Hong Kong sets a good example for how to implement an effective and comprehensive noise policy program at the local (city) level.

## **INTERNATIONAL INSTITUTE OF NOISE CONTROL ENGINEERING (I-INCE)**

Although the International Institute of Noise Control Engineering (I-INCE) does not develop noise policies such as a government body would implement, in addition to sponsoring annual international noise control Congresses, this professional organization also has a set of Technical Study Groups (TSGs) which address issues related

to noise policy development and produce highly useful summary reports. Below are two I-INCE TSGs which have been particularly active during the past five years.

### **INCE TSG3 – NOISE POLICIES AND REGULATIONS**

This I-INCE technical initiative deals with describing and assessing the effectiveness of noise policies and regulations around the world and involves a study of existing noise exposure policies and regulations in all countries which have recognized noise as a problem involving public health and welfare. To implement this study, a large-scale international survey was conducted of current noise policies in participating INCE Member Society countries and in other countries where information was available from publications. The TSG3 Final Report, Survey of Legislation, Regulations, and Guidelines for Control of Community Noise, contains information from the 21 countries which responded to the set of two I-INCE questionnaires. At the present time, the Final Draft of this Report is undergoing its final review and is expected to be published in hard copy and on the I-INCE web site (<http://www.i-ince.org/>) later this year.

### **I-INCE TSG5 – GLOBAL NOISE POLICY**

This I-INCE Technical Study Group deals with noise as a global issue versus noise as a local issue and has been reviewing the arguments for and against consideration of Noise as a Global Policy Issue. It is expected that TSG5 will present a rationale for considering noise at the international level, based largely on the implications of how noise may become an important non-tariff trade barrier issue. The I-INCE description of the scope of the TSG5 effort, in part, is as follows:

*“Technical Study Group 5 shall consider a global approach to noise in order that an effective international noise control policy may be developed and implemented. “All vehicles, devices, machinery, and equipment that emit audible sound are manufactured products; most of these products are involved in international trade. Industrial enterprises with worldwide operations produce many products in two or more different countries. Noise emissions of such products are appropriately the subject of international agreements and regulations. Noise immissions resulting from the operation of these products are growing in severity as vehicular traffic volume and the pace of industrialization continues to increase in many parts of the world. “An important aspect of the task charged to TSG 5 is to study the manner in which global policies were developed in the past and to make recommendations for improving current procedures so that future policies may provide more effective control of the emission and immission of noise. The roles of international bodies, national governments and local authorities should be clearly identified and, if necessary, clarified.”*

To the current authors' knowledge, the work of the TSG was completed in 2005 and the Final Report was circulated for final review and publication in 2006, although publication of a final version could not be verified at the present time. Whenever it is, or was, published, however, this seminal document has the potential to provide much-needed guidance on a vital noise policy issue; namely, whether a general global noise policy can be developed. Implementation of a follow-on I-INCE Technical Study Group (TSG7) is currently being started, but no information of their progress is yet available.

## INCREASING EMPHASIS ON AIRCRAFT NOISE

One of the more interesting aspect of developments in noise policies globally in the past five years is the growing emphasis on aircraft noise, particularly night-time aircraft noise. In particular, sleep disturbance from night-time aircraft landings and take-offs around airports has become a topic of particular concern. Noise policies have to somehow balance the economic benefits to societies obtained when night-time air traffic is allowed with the public's dislike of being awakened at night. At the current time, discussions are still continuing concerning the most appropriate sleep disturbance metric, the most appropriate time frame for describing and assessing night-time noise, the best way to describe awakenings scientifically, and criteria for maximum allowable awakenings. It is expected that the next five years will see new and updated noise policies in many countries, and particularly in the European Union.

## WORKSHOPS (ICAO CAEP AND WHO/EUROPE)

Some of the most important noise policy activities in the past several years have included a series of international workshops devoted to discussions of issues related to the development of noise policies, rather than specific new noise government policies themselves. As such, they are noise policy development **support** activities, rather than being government organizations which directly promulgate laws and regulations. Organizations such as the International Civil Aviation Organization (ICAO) Committee on Aviation Environmental Protection (CAEP) and the World Health Organization (WHO), which are both member organizations of the United Nations, have long had very active programs for a long period of time looking at both noise research and noise policy issues, although neither directly performs their own research. They do, however, sponsor their own study groups and committees and hold important international workshops. Several of the latter have been held during the past five years on critical noise issues, particularly those related to aviation noise impacts. For ICAO, their efforts often result in recommendations which are adopted as Standards and Recommended Practices and are incorporated, through the ICAO Council, as Annexes to the Convention on International Civil Aviation, which was internationally developed in 1944, (see: [http://www.icao.int/icao/en/m\\_about.html](http://www.icao.int/icao/en/m_about.html) for more information on ICAO). The WHO Noise Program for Europe is the only WHO effort related to noise which still remains and is located in Bonn, Germany (see: <http://www.euro.who.int/Noise> for more information on this program office.)

In October 2007, the ICAO Committee on Aviation Environmental Protection (CAEP) held a Workshop in Montreal, Canada on "Assessing Current Scientific Knowledge, Uncertainties and Gaps Quantifying Climate Change, Noise and Air Quality Aviation Impacts". Although the Final Report from this Workshop is still undergoing final development and review, it promises to provide excellent background scientific information relevant for future aircraft noise policies. In the meantime, several recent ICAO documents (ICAO 2004, 2006, 2007a, b) provide useful current noise policy documents.

Also in October 2007, the World Health Organization Regional Office for Europe held a somewhat similar Workshop in Bonn, Germany entitled "Aircraft Noise and Health: Evidence Review Meeting". This Workshop will be covered during the ICBEN 2008 Congress. More recently, WHO/Europe also held another Workshop in Bonn, Germany during May 2008 entitled "Practical Guidelines for Risk Assessment of Environmental Noise". Because this Workshop was only recently completed, no details are available at this time to describe the Final Report of this Workshop. Together, the

two WHO noise effects Workshops in 2007 and 2008 will make a quite valuable contribution to the development of future noise policies.

## **DEVELOPMENT OF NATIONAL AND INTERNATIONAL STANDARDS**

In addition to the development of national-level regulations, formal Standards development activities related to noise imission have also continued to evolve over the past five years, both at the national level in most developed countries and also in developing countries, such as Brazil, Mexico, etc., and at the international level by organizations such as the International Organization for Standardization (ISO). The most prominent and highly useful updated ISO Standard related to noise imission in the past five years has been ISO Standard 1996-1, "Acoustics — Description, measurement and assessment of environmental noise — Part 1: Basic quantities and assessment procedures". The importance of the updated ISO Standard is that it provides guidance on making Adjustments for sound source rating levels, describing and assessing high-energy impulse sounds, sounds with strong low-frequency content, annoyance caused by exposure to sound in multi-source environments, and – most importantly – predicting the estimated percentage of a population highly annoyed as a function of adjusted day/night sound levels. Although the details of these various methodologies cannot be described here because of ISO proprietary publication constraints, all of them are very important for noise policy applications related to environmental noise impact assessments. This Standard, and other related ISO Standards may be purchased from <http://www.iso.org/iso/store.htm>.

Although they will not be covered here, the national Standards programs of many individual countries have also made considerable progress in the comprehensiveness and adequacy of their noise Standards. Examples of just a few of these countries include Brazil, Mexico and the United States.

## **STATUS OF NOISE POLICIES IN DEVELOPING COUNTRIES**

One rapidly evolving noise policy topic which has to date received inadequate attention is the status of noise policies in developing countries in global areas such as Eastern Europe, Asia, South America and Africa. However, because countries in all these areas are in the process of developing "modern" technologies, including expanded industrial capabilities, noise in many cities in these regions of the world is quickly becoming excessive and adequate noise control policies are demonstrably lacking. This problem will only get worse in the near future. A recent Workshop during INTER-NOISE 2007 in Istanbul, Turkey was an initial attempt to begin to address this issue. During this Workshop, considerable agreement was easily reached concerning the importance of this growing problem and representatives of various "developing" countries agreed to work together in the future. What is needed now is for international organizations, such as the World Health Organization under the United Nations charter and others, to adopt this topic as a special focus item for future study groups. Much of the world's population lives in "developing" countries and more attention needs to be given to their needs. One special topic within this general area concerns whether or not noise policy approaches being adopted in most "developed" countries and being considered for a Global Noise Policy are appropriate, affordable and technically feasible for the "developing" countries. Obviously, much more work is needed in this area.

## CONCLUSIONS

Considerable effort has been expended by a great many people and through various organizations related to the development of noise policies between 2003-2008, since the last ICBEN Congress. In many countries and internationally there has been a good amount of progress has been made in the three relevant areas of noise regulations and laws, noise exposure guidelines, and noise Standards. As with the previous five-year period, the bulk of the progress still resides within the European Union, as represented by the European Commission. However, example are found for progress at the national level by many non-EU countries and internationally by many noise policy support organizations such as ICAO CAEP, WHO and I-INCE.

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