ABSTRACT

This paper reviews the ongoing work of I-INCE Technical Study Group (TSG) #6, Community Noise: Environmental Noise Impact Assessment and Mitigation. The objective of this working group is to produce a report which provides practical guidance to policy makers below the national level who are involved with the regulation and control of community noise/environmental noise, excluding the noise generated by neighbors. The proposed Final Report of I-INCE TSG #6, “Guidelines for Effective Management of Community Noise”, will provide information on how to perform an environmental impact analysis, the use of existing exposure-response relationships, the use of land use planning as a noise management tool, the use of cost-benefit analysis in considering noise control engineering tradeoffs, and the use of negotiation and consensus to achieve effective and balanced noise management strategies. This report will be aimed primarily at a non-technical audience. It will advocate for a flexible approach to noise management where the positive effects of controlling exposure to community noise are carefully balanced against the costs and technical difficulties of achieving effective noise control. Thus, the report of TSG #6 should be viewed as supplementing existing and still evolving community and environmental noise policies.

KEYWORDS: Noise Policy, Community Noise, Environmental Noise, Noise Impact Assessment
INTRODUCTION

Environmental noise is increasingly being perceived as being related to the sustainability of the growth of communities because it has negative effects on the quality of life and well-being of citizens, and the probability that it is harmful to human health \(^1\). Depending on the noise level, the context in which the noise is heard, and on many other factors such as the time of day, community noise can mask speech and interfere with concentration and relaxation, it can disturb sleep, and it often causes considerable annoyance and frustration. Many noise control initiatives carried through over the past 40 years or so have been very successful in engineering terms, but community noise problems still exist, more needs to be done, and without concerted and sustained action these problems will continue to get worse. However, deciding on the most effective noise control option is not just a matter of defining legally required noise exposure criteria and mandating action plans to achieve these required noise levels. There are often multiple, conflicting perspectives among the various stakeholders involved in the resolution of community noise issues that must be resolved to achieve effective solutions.

It is important to realize that even if people are careful to avoid generating excessive noise themselves, communities benefit greatly from noisy transport, commercial, and industrial infrastructures. People who live in noisy cities drive in cars, travel in trains, buses, and airplanes, and consume goods and services supplied from centralized depots using noisy trucks. Industrial and commercial processes are developed to maximize production at the lowest possible cost to the consumer, but not necessarily with the lowest levels of noise. Many leisure activities are noisy. Noise control can be expensive and can sometimes conflict with other environmental imperatives and community priorities. Effective noise management should aim at the best possible compromise among the often conflicting values of the various stakeholders and among potential noise abatement options. Environmental noise management decisions can only be determined after a comprehensive appraisal of all relevant data, the various technical solutions available, and adequate consideration of the cost and technical feasibility of these options. It is suggested that a well-defined Environmental Impact Assessment Process (EIAP) can provide the framework for decision-making on environmental noise issues when combined with appropriate noise exposure criteria. It can

\(^1\) Environmental noise can also have negative impacts on wildlife, domestic animals, and vulnerable historic structures, such as archeological sites. However, I-INCE TSG #6 only addresses the effects of environmental noise on the public health and welfare, including both quality of life and more traditional health topics, in order to limit the scope of the application of the environmental noise impact assessment process being described.
be a major tool used for Federally-funded projects, such as a highway improvement project, or at the regional or local level for all contemplated development projects that have the potential to significantly affect community noise exposure levels.

It is difficult for government officials to balance the negative consequences of environmental noise against the potential economic, social and other environmental consequences of reducing it. If shutting down a noisy industrial process to reduce noise would mean throwing people out of work, which would be worse for the community, the noise or the unemployment? Different variables can be more or less important in different situations. The political climate, based on local values and priorities, will often depend on the historical context and can change over time. Investment in noise control will normally have to be justified against competing demands on available resources. A comprehensive, scientifically defensible environmental noise impact assessment method can provide the framework for these decisions.

Available methods of assessment do not always agree, however, and can be interpreted differently. This causes confusion about their applicability. Taking note of this, the I-INCE Technical Study Group on Community Noise (TSG #6)\(^2\) is working to produce generic guidelines for conducting environmental noise impact assessments. The main purpose of TSG #6 is to provide practical advice for noise management decisions based on noise impact assessment in real situations, where economic, social and other environmental factors can be as or more important than the noise exposure benchmarks. There is no intention to question existing national or international regulations, guidelines or methods, but rather, to assist in the implementation of those policies. The currently evolving I-INCE TSG #6 guidelines are not intended to be prescriptive, rather they are intended to encourage a rational, comprehensive approach to environmental decision making based on “informed flexibility,” which is essential to achieving the best compromise solutions.

Environmental noise problems obviously involve both source and receiver parties. The attitude of each is determined, at least to some extent, by their understanding of the other party’s point of view. Practical experience shows that explaining the issues from both sides of the problem can often be at least as helpful as engineering noise control defined against arbitrary criteria. However, because of the almost infinite variety of different situations

\(^2\) The concepts and issues addressed in this paper are not presented as representing the consensus of opinion of I-INCE TSG #6, Community Noise. Rather, they are solely the thoughts of the author. I-INCE TSG #6 is still in the process of being reorganized and the future directions for this group are unknown at this time, although a portion of the material presented here is based on a preliminary, internal draft document previously prepared by this Technical Study Group.
which might arise in communities, it is hard to define fully prescriptive methods. To achieve the best compromise solutions it is best to set out all relevant details of any particular case in a framework to maximize transparency and communication among the affected parties. This may require more variables than can easily be displayed on a simple noise exposure map. It is equally important to analyze and portray the predicted impacts of the expected increase in noise exposure on the affected community. Rather than addressing only the overall exposure level, consideration needs to be given to the variety of potential negative effects of this exposure level, such as community annoyance, sleep disturbance, speech interference, hearing loss, non-auditory physiological health effects, and task interference, among others.

History and Current Status of TSG #6

Although the I-INCE Working Party on Community Noise (WP-CN) was originally founded in 1995 it has not been able to fulfill its purpose because of circumstances which prevented the co-conveners from pursuing the WP-CN objectives. Recent informal polling of leading international environmental noise researchers and noise control engineers has confirmed that there is still a strong need for this group, which is now proposed to be renamed as I-INCE Technical Study Group #6, “Community Noise”.

The objective for this working group it still to provide practical advice on noise management strategies for those involved with the regulation and control of community noise. It will provide an international response and complement to the new European Commission Noise Directive (e.g., see [1]) and the recent World Health Organization “Guidelines for Community Noise” [2]. TSG #6 is committed to preparing a report entitled “Guidelines for Effective Management of Community Noise”, which will primarily be addressed to a non-technical audience. This report will provide guidance on noise effect dose-response relationships, performing an environmental impact analysis, land use planning, the use of cost-benefit analysis as decision-making tool, and the use of negotiation between noise producers and noise receivers to achieve effective and affordable noise management strategies. It will advocate for a flexible approach to noise management where the positive effects of controlling exposure to community noise are carefully balanced against the costs and technical feasibility of achieving effective noise control. Thus, the report of TSG #6 should be viewed as supplementing existing and still evolving community noise policies. The concepts to be presented in this report complement those being implemented in Europe, but address an additional set of important noise issues necessary to provide a truly international perspective on noise control strategies and policies. A new report is needed to address topics not adequately addressed in previous documents, including noise effect dose-response
relationships, how to properly conduct an environmental impact analysis, and how to develop specific noise management strategies while balancing the positive effects of noise management against the cost and technical difficulties involved in effective noise control. TSG #6 will complement the effort of TSG #5, Noise as a Global Policy Issue. TSG #6 will address related, but different, noise policy issues than TSG #5 will address. These two TSGs are both needed.

TSG #6 held an organizational meeting during INTER-NOISE 2001 in Den Haag to discuss the purpose and scope of this group. Invitations to this meeting were sent to the twelve initial I-INCE member countries participating in the formation of this group and to leading noise effects scientists, noise control engineers, and noise policy administrators in many countries. In particular, members of the International Commission on Biological Effects of Noise (ICBEN) were invited to participate in the activities of TSG #6 as a consultancy team. This was done in order to broaden the expertise available to TSG #6, particularly in the areas of noise effect dose-response relationships and environmental impact analysis process (EIAP) issues. It was felt by the new Convener that this would significantly improve the comprehensiveness, depth, and quality of the eventual TSG #6 report.

Fifteen interested persons attended the TSG #6 meeting in Den Haag on 25 August 2001. Another 10-15 persons expressed strong interest in the activities of TSG #6, but were unable to arrange their travel schedules to attend this meeting. Thus, it is expected that the eventual membership of TSG #6 (including both the formal I-INCE representatives and the invited consultants) will include approximately twenty-five individuals from several different organizations. During the organizational meeting in Den Haag, several different opinions were offered by some of the meeting participants concerning what issues TSG #6 should address and what would be the purpose of the final report. The consensus of opinion was that it is very important for TSG #6 to continue its work, but that the original scope and purpose of TSG #6 should be reconsidered in light of the community noise policy and noise guidelines documents being produced by various European agencies, including both the European Commission and the World Health Organization.

A small follow-up planning meeting of TSG #6 was held at INTER-NOISE 2002 in Dearborn, MI. Discussions about the purpose and direction of TSG #6 went well and a proposed Revised Scope was submitted to the I-INCE Board of Directors for their review and approval. In order to clarify the current purpose and direction of TSG #6, the following was accepted by the I-INCE Board of Directors. Finegold [3] presented a paper discussing the issues under consideration by TSG #6.
Revised Scope

“The objective for this working group is to provide practical guidance to policy makers who are involved with regulation and control of community exposure to environmental noise, excluding the noise generated by neighbors. The Final Report of I-INCE TSG #6, will focus on performing an environmental impact analysis, but will also provide information on the use of dose-response relationship and land use planning, to achieve the goal of effective control of exposure to environmental noise. The report will be aimed primarily at a non-technical audience. It will advocate a flexible approach to control of exposure to environmental noise in a community through informed choices for the estimated costs of achieving various degrees of noise control. The report will also indicate areas that need further standardization and research.

The emphasis of the report will be on how a well-conceived environmental impact analysis process (EIAP) can be an integral part of an effective strategy for control of environmental noise, with land use planning as an essential element of the strategy, especially for countries that are still experiencing substantial community development. The report from will also address the issues of how noise control policies may have to account for national and global regional differences in cultures and expectations, differences in national perceptions of the appropriate role of government, differences in the availability of financing and technical support for effective noise control, and differences in the willingness of populations to accept a long-term commitment to implement the required regulations and noise control measures.”

The task of TSG #6 is to take a world-wide approach to strategies for managing exposure to community noise. One important aspect of the task of TSG #6 is to study how world-wide noise management policies and methods have developed over the past quarter-century, and to make recommendations for improving current practices so that future policies may be more effective. The emphasis will be on how a well-conceived environmental impact analysis process (EIAP) should be an integral part of an effective noise management strategy, and how land use planning is essential to making the world a quieter place to live. TSG #6 will also address the issues of how noise management policies may have to be modified to account for national and global regional differences in cultures and expectations, differences in national perceptions of the appropriate role of government, differences in the availability of financing and technical support for effective noise control, and differences in the willingness of populations to implement the required regulations.
In addition, TSG #6 will respond to the evolving promulgation of new community noise exposure criteria, which are being developed by different organizations based on dose-response relationships for community annoyance, sleep disturbance, and other adverse effects on noise on people. There is an urgent need to review the development of these dose-response relationships to ensure that there is an adequate scientific foundation for future noise management policies, and how these relationships can be used as part of the environmental impact analysis process (EIAP). Such relationships are appropriately the basis for international agreements and regulations for the control of noise.

Within the scope of TSG #6 is the preparation of an I-INCE Report, “Guidelines for the Effective Management of Community Noise”, describing a recommended generic approach to community noise management. The report will examine the environmental impact analysis process (EIAP), as well as other noise mitigation strategies, such as land use planning. The report will provide practical, well-balanced guidance for policy makers and others involved with the regulation, abatement and control of community noise. The objective of the report is to provide practical guidance concerning implementation of strategies for managing environmental noise exposure. The basic concept being developed revolves around the following recommended process for addressing community noise issues, particularly for new development projects:

- Stage A: Define the noise problem and gather required technical support information
- Stage B: Establish perspectives of all major stakeholders and begin identifying potential solutions
- Stage C: Obtain required technical information and perform an environmental impact assessment
- Stage D: Assess technical feasibility of noise mitigation options, balance costs and benefits, consider public interests
- Stage E: Finalize, implement, and monitor negotiated solutions for adequacy and acceptability

**Schedule**

*September 2001 – Submitted Interim Status Report and preliminary draft of Revised Scope*
January 2002 – Submitted Convener’s response to TSG members’ issues of concern and draft outline of Final Report
May 2002 – Circulated final draft of Revised Scope and draft outline of Final Report for review and comment
July 2002 – Circulated preliminary first draft of Final Report for review and comment
August 2002 – TSG #6 meeting at INTER-NOISE 2002
   - Discussed preliminary first draft of Final Report
   - Requested I-INCE Approval of Revised Scope
   - Began to pursue additional I-INCE member country representatives
October 2002 – I-INCE distributed approved Revised Scope to member countries with request to confirm or replace previous TSG#6 membership
August 2003 - TSG #6 meeting at INTER-NOISE 2003
   - Finalize TGSG #6 membership and request BoD to formally appoint INCE Member Country representatives
   - Present draft Final Report for I-INCE Member Country review
INTER-NOISE 2004/2005 – Complete Final Report and receive approval for publication and distribution

Conclusions

It appears that there continues to be considerable international interest in the issues being addressed by I-INCE TSG #6, Community Noise: Environmental Noise Impact Assessment and Mitigation, and that publication of a Final Report, “Guidelines for Effective Management of Community Noise”, is desired. Needless to say there are a wide variety of opinions on various issues related to this topic. If it is possible, however, to reach international consensus on these issues, there are potentially significant benefits to noise control policy-makers, those who manage noise control programs, and the world’s population. I-INCE TSG #6 will continue to work to achieve this consensus.

References