NOISE/NEWS INTERNATIONAL

Volume 12, Number 3
2004 September

A quarterly news magazine with an Internet supplement published by I-INCE and INCE/USA

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Volume 12, Number 3 **2004 September**

Features

Departments

Cover Photos:

New Year's Eve fireworks display at Copacabana Beach. The beach is the focal point for the New Year's Eve celebration, Réveillon, as it is known in Brazil. • Photo Credit: Jean Jacques Limborg Courtesy of Rio Convention & Visitors Bureau

Night Sky
Courtesy of the Greater Minneapolis Convention & Visitors Association

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I-INCE

The International Institute of Noise Control Engineering (I-INCE) is a worldwide consortium of societies concerned with noise control and acoustics. I-INCE, chartered in Zürich, Switzerland, is the sponsor of the INTER-NOISE Series of International Congresses on Noise Control Engineering, and, with the Institute of Noise Control Engineering of the USA, publishes this quarterly magazine and its Internet supplement. I-INCE has an active program of technical initiatives, which are described in the Internet supplement to NNI. I-INCE currently has 46 Member Societies in 39 countries.

INCE/USA

The Institute of Noise Control Engineering of the USA (INCE/USA) is a non-profit professional organization incorporated in Washington, D.C., USA. The primary purpose of the Institute is to promote engineering solutions to environmental noise problems. INCE/USA publishes the technical journal, *Noise Control Engineering Journal*, and, with I-INCE publishes this quarterly magazine and its Internet supplement. INCE/USA sponsors the NOISE-CON series of national conferences on noise control engineering and the INTER-NOISE Congress when it is held in North America. INCE/USA Members are professionals in the field of noise control engineering, and many offer consulting services in noise control. Any persons interested in noise control may become an Associate of INCE/USA and receive both this magazine and *Noise Control Engineering Journal.*

NNI Internet Supplement

www.noisenewsinternational.net

- Links to the home pages of I-INCE and INCE/USA
- Abstracts of feature articles in the printed version
- Directory of the Member Societies of I-INCE with links, where available, to the Member Society Profiles and home pages
- Links to I-INCE Technical Initiatives
- Calendar of meetings related to noise—worldwide
- Links, where available, to NNI advertisers
- Links to news related to the development of standards
- Link to an article "Surf the 'Net for News on Noise," which contains links to noise-related sites—worldwide

Monitoring and Prediction of Environmental Noise

In recent INTER-NOISE Congresses, *global noise policy* has been discussed very earnestly and *Technical Study Groups* have been organized.

Concerning this problem, I would like to make some brief remarks about the relationship between "noise monitoring" and "noise impact assessment" (prediction). The former is intended to measure and evaluate the existing noise situation in the environment and therefore any noise indicator can be used if it is proper for the description of the noise. On the other hand, the latter is to predict the noise situation in the future and therefore the noise indicator must be proper for theoretical calculations. In this respect, equivalent continuous sound level ($L_{\mathrm{Aeq},T}$) is the best because this indicator is easy to obtain using energy-based calculations. Percentile levels and maximum levels can be used for noise monitoring but it is difficult to predict these indicators by calculation.

In the process of environmental impact assessment of noise, the predicted results have to be checked with any legislation (regulation, standard, guideline, etc.). For this purpose, it is most desirable that the same or compatible noise indicators are specified in legislation for noise monitoring and impact assessment. In Japan, the document "Environmental Quality Standards for Noise" was revised in 1998 after an interval of 27 years and $L_{\mathrm{Aeq},T}$ has finally been adopted as the main noise indicator for general and road traffic noise. This revision has not only produced an internationally consistent procedure for noise monitoring but also united the noise monitoring and impact assessment.

On the other hand, such noise indicators as 5% level and fast-maximum level are still specified in the "Noise Regulation Law" according to the difference of time variation characteristic of noise sources. Although such industrial noises as construction works are subjected to impact assessment according to the "Impact Assessment Law" (1999) in Japan, we are fettered by these specifications.

As the international standard specifying the assessment procedure for environmental noises, we have ISO 1996-1:2003, in which a method of weighting according to the difference of kinds and properties of noises is included. This weighting method could be applied to noise impact assessment but it seems very difficult to apply this method to environmental noise monitoring for the evaluation of the existing noise situation including complex noises with different properties.

I-INCE Technical Study Group #3 "Noise Policies and Regulation" is now working to assemble and catalog the noise policy regulations and standards of each of the participating countries. As a result of this work, it has been found that the properties of laws/standards, specification of noise indicator and its value and measurement procedure are different in respective countries. For the harmonization of environmental noise policies, the possibility of unifying the following points need to be discussed:

- Definition and classification of each legislation (regulation, standard, guideline, etc.)
- Noise indicators
- Measurement/assessment position (Indoor or outdoor, or both? What is the measurement height? Free field or near the buildings including reflection?)
- Reference time interval and time-weighting (Daytime and nighttime, respectively or L_{dn} or L_{den}?)
- Methodology for the assessment of complex noise situations
- Development of noise prediction models including noise mapping

Hideki Tachibana
2004 International INCE President

International Cooperation on Environmental Noise

Marion Burgess

Asia-Pacific Editor

The adequate control of environmental noise is acknowledged by most governments around the world as important for establishing and maintaining an acceptable environment for the community. As discussed by Bernard Berry in the editorial in the March issue, the enlargement of the European Union (EU) and the extended implementation of the European Noise Directive will lead to greater opportunities for addressing environmental noise issues in the coming years. In addition to the Directive, both the EU and other European counties are supporting significant projects related to various aspects of environmental noise. It should be noted that this will inevitably have far reaching effects on noise management throughout the world.

Most countries, including those in the Asian region, develop their own approaches to environmental noise management and control. Unlike the situation in the EU, there is no structure for pooling of the knowledge between countries. Even within some countries, the policies and regulations are set at the state or district level, and in some degree of isolation. One outcome of economic rationalism is that governments are more concerned about wasting time and resources to "re-invent the wheel." Thus, when initiating or reviewing legislation, policy and regulations they first seek the guidance of what has been done elsewhere. Hence the approaches to noise assessment and management in the EU have the potential to become a resource for the rest of the world.

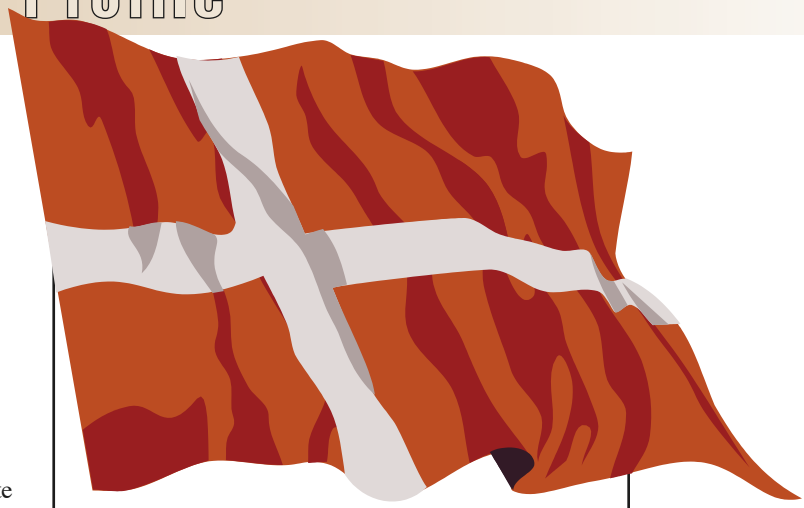
Countries with very different social, economic and climatic conditions to the EU will be taking guidance from the EU approaches, and the easy route may be to adopt the basic approach with only minor changes to comply with the local legal system. There is a trend within many governments to reduce staff with skills in particular areas and replace them with generalist bureaucrats—with reliance on contractors for specific investigations. This increases the risk that the approach adopted in the EU will be followed in other countries without adequate consideration of the appropriateness for their society. For the Asian region, many of the countries are in tropical or sub tropical regions and hence have different buildings and lifestyles. Non-EU countries need to be very aware of the effect of these differences on the acoustic environment, and hence the reactions to noise.

In addition to information available on the Internet, participation in international conferences, such as INTER-NOISE, is an important means to discover more about projects in progress developing trends. This assists with the interpretation of the guidance material and assessment of the appropriateness for other countries.

The initiatives by I-INCE for technical study groups and other workshops with international involvement also encourages interaction and discussion between those from different countries. This is another resource, which requires some effort as it is in addition to our normal work—but it has the potential for great rewards.

The opportunities are there for us to find out more about the requirements and the expectations of those working in the area of environmental noise in different countries. It is up to us to make the most of these opportunities to expand our knowledge, and to assist in assessments of the appropriateness of guidance on environmental noise that may be available from other parts of the world.

Danish Acoustical Society



The Danish Acoustical Society (DAS) will celebrate a significant milestone in 2005 as it notes the 50th anniversary of its founding. DAS, one of four Scandinavian acoustical societies, was organized on 1955 January 13, by a group of professionals that included Prof. Dr. Tech. Fritz Ingerslev and Dr. Tech. Per V. Brüel.

Several special events are planned to commemorate the anniversary. A formal celebration is set for 2005 February 04 . This event will feature invited speakers and a reception. In addition, the group will publish a 200-page "anniversary book" that will contain 20 articles on acoustical topics that were—and still are—of interest to professionals in this discipline. Some articles date to 1935. The book, which will be published in Danish, will also include stories about the group's founders. Dr. Brüel is preparing a smaller, more personal publication. It will be available in both Danish and English.

Since its beginnings in 1955, DAS' membership has grown to 240 professionals, including 11 sustaining members. Seventy percent of the membership is from industry, 20 percent from national and local institutions, and 10 percent from higher education. To encourage new members and to promote life-long affiliation with the group, graduate students receive a complimentary one-year membership. The society remains dedicated to its original goals: to promote and propagate nationally the knowledge of acoustics and its practical application, and to establish national and international contact between people interested in acoustics, in particular cooperation with Scandinavian, European, and other foreign organizations. DAS has played a critical role in organizing several important acoustics meetings, including the joint Baltic-Nordic Acoustical Meeting in 2002.

DAS focuses its activities in five specialty areas: building and room acoustics, electroacoustics, environmental acoustics, machinery acoustics, and psychoacoustics. Members select one or more specialty areas; the managers of each area are responsible for the activities of the group, which may include industry and university visits. All five groups arrange for speakers for the annual DAS "Day of Acoustics." DAS is especially interested in connecting scientists and practitioners within its specialty areas.

DAS has recently been chosen to assist in the review process of new acoustical standards from the Danish Standards Group and will also provide input to the Danish Environmental Protection Agency on its new acoustical guidelines.

Management of the society is in the hands of a six-member board: Claus Møller Petersen, president, and board members Dr. Tech. Niels Olhoff, Torben, Douglas, Søren, and M.Sc. Henrik S. Olesen. Arne Th. Christensen is treasurer and secretary. The Society's web address is www.d-a-s.dk. The site contains information on meetings, hearings of proposals for new standards, and links to courses in acoustics as well as links to sponsor's websites (including job notices) and websites of other acoustical organizations. The e-mail address for DAS is d-a-s@oersted.dtu.dk.

DAS is affiliated with the European Acoustics Association (EAA) and the International Institute of Noise Control Engineering, which entitles DAS members to receive the publications of these two groups at no charge. Members of DAS are also admitted to the Nordic Acoustical Society (NAS) whose activities include organizing Nordic Acoustical Meetings held every other year in either Denmark, Finland, Sweden, Norway, or Iceland.

This is the 47th in a series of articles on the Member Societies of International INCE.

First Annual Workshop on U.S. Noise Policy Developments

William W. Lang, Workshop Chairman
Noise Control Foundation
Poughkeepsie, New York

Workshop Chairman Bill Lang opened the First Annual Workshop on U.S Noise Policy Developments on the second day of NOISE-CON 04, Tuesday, 2004 July 13, in Baltimore, Maryland. He introduced co-chairman Bob Hellweg, who spoke later in the program. Earlier workshops have been held on noise topics, but this was the first to focus on the latest developments in U.S. noise policy. The format of the workshop was to have presentations by a panel of specialists from government and from the private sector followed by an open discussion. Each of the panelists presented a short overview of recent actions in his areas of expertise, with special emphasis on those actions related to noise policy at the Federal, state, and municipal levels.

Before introducing the members of the panel, Bill Lang set the stage with a background paper.

The Challenge of a National Noise Policy

Our task this afternoon has been made easier by the Study Team on National Noise Policy of INCE/USA which was responsible for a recently-published special issue of *Noise Control Engineering Journal* (**51**(3), 2003 May-June). This special issue made the case that we need to reexamine our national noise policy at the highest levels; and, if possible, develop a new national policy that is more in agreement with the policies of the other advanced countries around the globe.

Today America does not have a single noise policy, but rather a plethora of noise policies, most of them uncoordinated and many contradictory. The development, formulation, and implementation of America's noise policies are currently the responsibility of a dozen Federal departments and agencies, as well as the corresponding departments and agencies of the fifty states and the local authorities, administrations and municipalities. Each is implementing a noise policy within its jurisdiction or area of responsibility under the mandate it has received from its governing authority. Our national policy is the sum total of these policies. Following are the agencies and departments of the Federal government that are involved with noise:

- Federal Aviation Administration (Department of Transportation)
- Federal Highway Administration (Department of Transportation)
- Federal Railroad Administration (Department of Transportation)
- Occupational Safety and Health Administration (Department of Labor)
- National Institute of Occupational Safety and Health (Department of Health and Human Services)
- Mine Safety and Health Administration (Department of Labor)
- General Services Administration (Public Buildings Service)
- National Park Service (Department of the Interior)
- Department of Housing and Urban Development
- Department of Defense
- U.S. Army (Department of Defense)
- U.S. Navy (Department of Defense)
- U.S. Air Force (Department of Defense)
- U.S. Coast Guard (Department of Homeland Security)

None of these has the role of "leading agency," with the result that there is very little coordination among the agencies at the Federal level or between the Federal level and the state and local agencies. An exception is the aircraft/airport area with its Federal Interagency Committee on Aviation Noise (FICAN). The primary task of FICAN is to monitor the status of research conducted by all Federal agencies dealing with aircraft noise, but it is a committee with neither a coordinating nor regulatory function. In the late 1960s, the 1970s, and the early 1980s, America led the world with its noise policies. However, with the removal by the Congress of the U.S. Environmental Protection Agency from the above list in the early 80s, America lost its leadership position and has been drifting ever since without a cohesive national policy.

To set the stage for this workshop, consider the following categories of noise for which policies should be reexamined and in many cases replaced:

- **Occupational noise**—unwanted sound in the workplace, indoors or outdoors, caused by sources in the vicinity of the workplace,
- **Environmental noise**—unwanted sound in a non-occupational setting,
- **Consumer and industrial product noise**—unwanted sound at the position of a user or bystander of a noise-producing product.

The scientific basis for noise control is quite different for the first two above.

Occupational noise *may* cause hearing damage after prolonged exposure to high noise levels. This is a physiological effect, and *no* adaptation to noise is possible. An

individual cannot say: "I will not have my hearing damaged by the noise." The lower levels of environmental noise, on the other hand, generally do not cause hearing damage, but they *may* cause annoyance, sleep interference, and speech interference, which are psychological effects, and *much* adaptation by individuals is possible. An individual can say: "I will shut that noise out of my mind." Consumer and industrial product noise is treated in the same manner as environmental noise.

In this country and abroad, there is a community of people concerned with occupational noise and another community concerned with environmental noise. Those concerned with occupational noise are physiologically oriented—audiologists, medical personnel, and physiologists. Those concerned with environmental noise are psychologically oriented—principally psychologists. Because of their different backgrounds and interests, the two communities are somewhat isolated from one another, and few people are involved in both communities. The exception is the engineer as both occupational and environmental noise problems require an engineering background in order to reduce the noise levels.

Engineers played a major role at the beginning of the 1970s in working for noise policy in all areas of noise, but after the Congress passed the Noise Control Act of 1972, their role was diminished. Today, engineers have only a minor role in the formulation of noise policy. Despite the fact that engineers have detailed knowledge of noise control in both occupational and environmental settings, their services by the formulators of policy are considered as purchasable items to be provided by subcontractors.

Occupational noise may cause hearing damage after prolonged exposure to high noise levels. This is a physiological effect, and no adaptation to noise is possible. An individual cannot say: "I will not have my hearing damaged by the noise."

The principal stakeholders of noise are the legislatures, the government agencies, the local authorities, the manufacturers (both exporting and non-exporting, with the former more concerned about noise policy than the latter), the non-governmental organizations (NGOs), and the public. The first three are responsible for the development of noise policy. The key players in the formulation of any noise policy should be the representatives of stakeholders who are experts in the life sciences, law, public policy, and, most importantly, engineering. On a global scale, the key geographic units involved with noise policy are the European Union, Japan, and the U.S.A., which have the largest economies in the world. Any international agreement on noise policy can only come about with the active participation of all three.

What is noise policy? The following definition is close to international agreement and will serve for the purposes of this workshop:

> A *noise policy* is a high-level overall plan that includes the general goals and strategy of a national or international governmental body or agency for the control of occupational, environmental, and consumer and industrial product noise, as well as specific references to relevant codes.

Concluding with a question, is America faced with an engineering dilemma or a public policy challenge, or both? The engineering dilemma is that, while engineers have the technical know-how to provide noise reduction, they have historically been reticent to assume a leadership role in policy matters. The public policy challenge is that noise policy matters have historically been the province of those trained in other professions who have limited knowledge of noise control engineering. Is it time for the engineers to take charge in seeking a redefinition of America's national noise policy?

Aircraft/Airport Noise

The first of the panelists to speak in the workshop was Gregg Fleming, Chief of the Environmental Measurement and Modeling Division at the Volpe National Transportation Systems Center in Cambridge, Massachusetts. He said that his presentation would not involve noise policy directly but would look at some key technical initiatives that, in the future, may have a very significant effect on future aviation noise policy. He listed three key items that are important.

A **center of excellence** (COE) has been established as a joint effort of the Federal Aviation Administration (FAA), the National Aeronautics and Space Administration (NASA), and Transport Canada. The COE consists of these agencies plus seven universities and several public/private sector partnerships. The Massachusetts Institute of Technology (MIT) is the university leading the effort. The consortium is looking in detail at five specific problems.

First, the issue of low-frequency metrics for aircraft noise. These metrics are particularly important at the start of an aircraft takeoff roll.

Second, the COE is looking into measurement metrics and health effects. The lead universities on this particular task are Purdue University and Penn State University. The charge to the universities is to find the most suitable metric(s) for assessing aircraft noise, forgetting what has been done in the past. The policy implications of such a study are clear.

Third, MIT is leading the task dealing with technology operations and policy. It includes the cost of environmental impacts and the cost of mitigation techniques. This task is on a fast track with some results due by the end of 2004.

Fourth, the COE is studying the development of a continuous descent approach for aircraft. Currently, perhaps with the exception of some operations at Heathrow Airport in the UK and Schiphol Airport in the Netherlands, aircraft use a stepped approach. The continuous descent approach involves an intercept glide slope at somewhere around 10 to 15 thousand feet and a 3-degree glide path into the airport. This approach has positive environmental implications for both fuel economy and noise reduction.

Fifth, land-use airport controls are being examined. Currently a good job is being done, but a better job can be done in the future.

The second major issue that is being examined is U.S. noise policy related to supersonic flight over land and its potential impact on the development of a supersonic business jet. This issue means that FAA will have to look back at all of the work that was done on sonic booms in the 1960s and perhaps establish new metrics for assessing sonic booms. He said that there is a push for a representative demonstration aircraft, and he showed a photograph of an airplane that is a modified fighter jet. The sonic boom profile on the fighter aircraft has been successfully modified, but more data is needed using an aircraft more representative of what might be used in the civil sector.

The issue of civil supersonic aircraft was examined several years ago by Boeing, which effectively concluded that a high-speed civil transport was not economical because of the current ban on supersonic flight over land. A 2003 report by the National Research Council indicated that the technology to improve the sonic boom signature exists and the time is ripe for further development. There was a related FAA workshop in 2003 (described in the *Federal Register*) looking at minimization of sonic boom. This obviously has potential policy impacts. The need for a demonstration aircraft has also been expressed by the Defense Advanced Research Projects Agency (DARPA).

The **Aircraft Environmental Design Tool** (AEDT) is a program of the Federal Aviation Administration. This program calls for the FAA to examine all of the environmental interdependencies (noise and emissions particularly) when assessing a particular project or policy. He said that one very important part of future noise policy is to be able to make accurate predictions of aircraft noise levels in the future. AEDT is currently being designed and scoped with the assistance of the National Research Council's (NRC) Transportation Research Board (TRB). Such a policy-integrated environmental approach should be very valuable in the establishment of future aviation noise policy, and be available for use by the end of this decade.

. . . one very important part of future noise policy is to be able to make accurate predictions of aircraft noise levels in the future.

Local Citizens' Issues

The second panelist to speak was Les Blomberg from the Noise Pollution Clearing House, Montpelier, Vermont, a non-profit organization that deals directly with the public (*www.nonoise.org—Ed.*). He said that the number one complaint on the New York City "quality of life" hotline is noise, with 70 to 80 percent of the calls being related to noise issues. This, he said, shows that the problem is not being addressed. He then quoted some statistics from the American Housing Survey and the number of buildings built within the last five years. From the number of noise complaints related to housing, he said, it is clear that in this country we are building "trash."

Although noise does rate above crime with the public, he said the main issue is that the noise problem is not being solved. He then discussed the situation with movement of people to rural and suburban locations. A Michigan poll asked why people tended to move and produce rural and suburban sprawl. A great surprise was that noise as an issue beat out other issues such as schools, crime, etc. But, he said, moving to the suburbs is not necessarily working out well. While suburban and rural areas were quiet, there is now a loss of natural quiet in those areas due to the many noise sources that people have in suburban locations. He said that this fact may have a significant effect on the public perception of noise because we may lose the value of quiet in our culture. He noted that this may, in turn, lead to a lack of interest in solving noise problems.

He then characterized different groups of people in the spectrum of the population. There is one group of noise-sensitive people, another group of more-or-less average people who have been exposed to noise and

are seeking peace and quiet (this group makes up most of the individuals who call the Noise Pollution Clearing House for solutions). Then there is an average group not yet exposed to noise, and another group indifferent to the noise problem, another group who are basically the noise makers, and finally a group of people who are insensitive to the noise.

What then do people want, he asked? The number one answer seems to be sleep. Persons want to be able to sleep quietly in their home without interruption. He said that there is some disconnect between the scientific data relating noise and sleep and the perception of the public.

Other issues of concern to the public relate to the sovereignty of the home. People like to believe that their home should be quiet and a place of refuge. Moreover, persons like to have control over noise. He cited aviation noise as an example of noise over which the public has very little control.

He noted that the public would like to purchase quiet products. "But where?" he asked. Most persons, including professional persons, are unable to find noise ratings for many types of equipment.

Other items related to what the public wants are civility and respect. When a person complains to his or her neighbor about noise, a major aspect of what he or she is concerned about is the uncivil behavior of the noise maker. The public would like to see "stupid" noises eliminated. One example is leaf blower noise, which is perceived by many to be unnecessary. A rake can do the equivalent job with no noise. Car alarms are another example, because it is widely believed that these devices are ineffective.

When a person complains to his or her neighbor about noise, a major aspect of what he or she is concerned about is the uncivil behavior of the noise maker.

The public is concerned that there is no reciprocity. For example, if two neighbors both mow their lawn, both neighbors may be happy. But if a one-way situation exists, the neighbor not using the noisy device may be quite unhappy.

He finished by saying what he believes people think:

- They think that products have to be noisy and do not understand the ability of engineers to quiet products.
- They feel powerless to control the noise themselves.
- They recognize that noise policy is scattered in many different places and, often is strictly a "hit or miss" situation.

Those members of the public who are exposed to noise and have dealt with the federal government are deeply frustrated. They are most likely to describe noise metrics and the agencies that deal with them (usually FAA, FRA, and FHWA) in most uncomplimentary terms. In general, the experience of people around airports, train tracks, and highways is that the government agencies do not care about their well-being, that they do not always tell the truth, and that they use the complexities of noise to obfuscate the issue. Those in the population who are exposed to transportation noise tend to have a low opinion of our transportation noise policies and the government officials responsible for their implementation.

Industrial Noise

The third panelist in the workshop, Eric Wood from Acentech, Cambridge, Massachusetts, addressed noise policy developments in the industrial sector. He said that noise policy is very clearly important and emphasized the need for greater cooperation to achieve a coordinated National Noise Policy in the U.S. He reminded everyone that 30 years ago the U.S. Environmental Protection Agency found that more than 50 percent of the U.S. population was exposed in residential areas to exterior long-term day-night (L_{dn}) A-weighted noise levels greater than 55dB.

While the Occupational Safety and Health Administration (OSHA) is the most significant agency with respect to workplace occupational hearing damage, he said that his remarks would expand to other areas that do not involve hearing damage. He told us that many people believe the occupational noise standard is in need of change and better enforcement. He mentioned that work is underway to expand the OSHA noise exposure standard to better address workers in the construction industry. As an aside he mentioned that the Environmental Protection Agency is in the process of developing new rules for hearing protectors.

As an example of state interest in noise, he cited the Maryland program, which began in 1974 and includes non-mandatory noise goals and enforceable noise limits. He said that there has been recent interest among regulators and other parties in Maryland to update and revise their requirements. He noted that to his knowledge Maryland was the only state with a full-time noise control enforcement officer; however, that officer recently retired. He discussed briefly the noise requirements in the state of Maine. He said that those requirements have been very carefully written and, in a 2001 paper by Tom Doyle (*NOISE-CON 01 paper NC01_067)—Ed.*), were characterized as among the most complex noise regulations in the United States.

As to other states, he said that the Commonwealth of Massachusetts has state-wide requirements implemented by the Massachusetts Department of Environmental Protection. Their basic policy requirement is that noise from industrial sources not exceed the background sound level in residential locations (L_{90}) by more than 10 dB and to avoid tones. The Department attempted to revise the Massachusetts noise policy requirements to require lower limits, and that effort was generally unsuccessful with one exception; the Massachusetts Energy Facilities Siting Board is limiting the noise from new power plants to be within 3-5dB of the lowest L_{90} hourly sound level measured in nearby residential areas before construction of the plant.

New Hampshire, he said, does not have any state-wide noise requirements; but the State Attorney General has retained an experienced acoustical consultant to serve as an advisor during the licensing hearings, design evaluation and reviews, and compliance monitoring during operation of certain major new industrial facilities. The goal is for industrial facilities to operate as good acoustical neighbors. He stated that the role has been to help achieve a reasonable balance. A balance between the need for industrial development in the state and the need to be respectful of nearby residential neighbors.

At the municipal level, there was a major upgrade of the requirements to address and control ventilation noise in Cambridge, Massachusetts – which is experiencing considerable new development, particularly with medical and bio-industry facilities. There are also new city noise limit requirements in South Portland, Maine.

He said that the New York City noise ordinance is undergoing a major revision, and pointed to the stated public policy in the city with respect to noise. The preamble:

> Declares it to be the Public Policy of the City of New York to reduce the ambient sound in the City.
>
> Declares it to be the Public Policy of the City of New York to preserve, protect, and promote the public health, safety, and welfare, and the peace and quiet of the inhabitants of the City.
>
> Declares it to be the Public Policy of the City that every person is entitled to ambient sound levels that are not detrimental to life, health, and enjoyment of his or her property.

The New York City laws, if adopted, would relate to both A-weighted and C-weighted sound levels, octave-band levels, and both steady and impulsive noise. Both absolute limits and limits relative to the baseline ambient sound level would be included. Limits measured outside and inside a receiving property would be included. Certain sounds would be prohibited if "plainly audible." Also, construction projects would require detailed noise mitigation plans.

He then turned to non-governmental organizations with noise limits and noise policy requirements. He said that the Import/Export Bank of the U.S. includes noise limits on industrial projects that they fund, and that the World Bank also has noise requirements written in terms of equivalent A-weighted sound levels. The World Bank A-weighted noise limits are 55 dB daytime and 45 dB nighttime at residential areas near the funded project. Alternatively, the World Bank limit for funded-project noise is equal to the preexisting equivalent baseline sound level.

He pointed out that in private industry, noise policy is often established by individual companies within an industry. In terms of hearing damage inside factories, a long-term A-weighted level of less than 85 dB throughout frequently occupied work areas is considered to be safe and healthful for employees in the plant. Responsible corporate management at certain companies understands their responsibility to provide safe and healthful work environments.

He said that in his experience some power plants near residential areas have placed rather low noise emission limits on their plants – some as low as A-weighted levels of about 40 dB, which is 20 dB lower than noise criteria employed by state and federal transportation agencies.

He identified various important but missing elements in U.S. noise policy, including:

- Cooperation and coordination are needed,
- modern technology is needed,
- well-founded engineering and research are needed,
- technology transfer programs are needed,
- public participation is difficult but necesssary, and
- modern criteria are needed.

There is often little cooperation and coordination between governmental agencies. This leads to inconsistent noise

policies. And, the technology transfer from universities, government agencies, and so on into the private sector is often missing. He cited as a good example the cooperation between the National Aeronautics and Space Administration (NASA) and the aircraft and engine manufacturers and their subcontractors in producing very significant reductions in airplane noise emissions over the last 40 years.

He concluded by stating that a better-coordinated National Noise Policy is needed in the United States.

There is often little cooperation and coordination between governmental agencies. This leads to inconsistent noise policies.

Occupational Noise

The fourth panelist to speak in the workshop was Charles Hayden from the National Institute of Occupational Safety and Health (NIOSH), Cincinnati, Ohio. He said that the paper by Bruce and Wood (*Noise Control Engineering Journal*, **51**(3), 2003 May-June) on noise policy, while over a year old, was still current regarding the status in occupational noise exposure policy. He recommended that persons interested in occupational noise policy read that article for specific information. A few exceptions, however, are activities in the construction industry – in which both the Occupational Safety and Health Administration (OSHA) and NIOSH are interested. While there is no hearing conservation program requirements for the construction industry currently in place, there is an OSHA Advanced Notice of Proposed Rule Making (ANPRM) under consideration related to reducing noise induced hearing loss (NIHL) to construction workers. The comment period is now closed and stakeholder meetings are ongoing. He also pointed out that the Federal Railroad Administration (FRA) issued a request for comments on their proposed rule this past June in the Federal Register aiming to reduce NIHL amongst railroad workers. Similar to OSHA's construction industry activities, the proposed FRA rule seeks to establish formal hearing conservation programs for its noise exposed workers and to emphasize the use of engineering noise controls.

"How long", he was asked, "until some regulations are in place?" He responded that new noise regulations for the construction industry are difficult to put a timeline on but that current draft regulations would emphasize engineering controls. In the meantime, he said, NIOSH is building a database of sound power levels for a variety of powered hand tools used in the construction industry. This database can used by tool buyers and end users to ensure they are buying the quietest available equipment. The database can also serve tool manufacturers in comparative noise studies.

He encouraged attendees to join a new program called the **OSHA New Alliances Program**. This program is not a regulatory activity, but an activity that brings industry, government, labor, academia, and others together to solve workplace health and safety issues. OSHA's New Alliances can be used as a seed to developing a noise control consortium and, potentially, a national noise policy document on occupational noise. He encouraged INCE/USA to communicate with engineers and audiologists in government and industry to actively promote public health and safety issues regarding occupational noise exposure.

Consumer Product Noise

The fifth panelist in the workshop was Robert Hellweg who spoke on Consumer Product Noise. He pointed out that in his opening presentation, Bill Lang stressed the similarities between product noise issues and environmental noise issues. However, Hellweg said that noise of products can also be an indicator of poor product quality. Also he said that there is a difference in the acceptability of product noise between a user of a particular product and a non-user. This situation, he said, is illustrated for automobiles where major

emphasis is placed on the noise heard by a user within the vehicle and little attention is paid to the noise received by "bystanders" that are in residences near the road.

He then reviewed current policy in the United States with regard to consumer products. For the government, the major action took place in the mid-1970s with a labeling program proposed by the U.S. Environmental Protection Agency; however, that program was not a success due to many reasons, one of which was the lack of funding. Other sources of policy involve standards written by organizations such as the American National Standards Institute and specifications in private industry that are imposed. He referred to a draft ANSI standard S12.61-200x, which is similar to an international document, ISO 4871. The major differences are that the American version contains one metric for reporting noise emission values (a statistical maximum value) and the international version contains two metrics. The American version also gives more guidance to the manufacturers on how to determine the statistical maximum noise values.

He then turned to the situation in Europe as an example of a region that is covering consumer product noise values in three areas: government regulations and laws, **Eco-labels**, and voluntary industry programs. He said that what we would call laws in the United States are directives in Europe, and then it is the responsibility of the European member states to implement those directives into law and regulations. For example, the Construction Noise Directive places limits on the noise of lawnmowers.

He said that another approach used in many countries is an **Eco-label** (or Ecological labels) in which one of the criteria for receiving the Eco-label are product noise emissions. These programs are successful in the European countries that have them and enable consumers to purchase "environmentally friendly" products whose noise emissions are acceptable. Countries and programs with **Eco-labels** include the Blue Angel label in Germany and the White Swan label in the Nordic countries – Norway, Sweden, Denmark, Finland, and Iceland. Product types include personal computers, laptop computers, printers, copiers, dishwashers, household dryers, and washing machines.

He also said that voluntary noise labeling by manufacturers and industries can take place in two ways: first as voluntary labels attached to equipment and secondly as user information published in manuals or specification sheets. As an example, three Nordic Information Technology (IT) associations have an IT-Eco declaration for computer products that includes noise values according to ISO 9296. This program is successful with more than 3500 IT-Eco declarations issued since its start in 1996.

In the end, he said that we should have noise values of consumer products available so that individuals can make intelligent buying decisions.

However, he raised an issue that George Luz addressed in his NOISE-CON 2004 paper as to the understanding that consumers have with respect to the noise levels. He referred to a paper presented by Matthew Nobile at NOISE-CON 2003 (*NOISE-CON 03 paper NC03_059. See also NOISE-CON 04 paper NC040983—Ed.*), and used as an example a label defined by ISO 9296 where the relevant metric is A-weighted sound power level. He said that it might be very helpful to have an indication of the relative loudness of the equipment. For example, if the emission level of a particular product is 63 dB it could be said that a product twice as loud is approximately 73 dB and a product half as loud is approximately 53 dB.

Another alternative to provide more information to the non-expert user would be to have a range of levels for similar products in addition to the level for the specific product being labeled. He gave an illustration of how such labeling or information is handled in other areas: automobile fuel efficiency and product energy efficiency.

In the end, he said that we should have noise values of consumer products available so that individuals can make intelligent buying decisions. For this to happen, products need to be tested by manufacturers following uniform standards and reported to consumers in a manner that is easy for them to understand and consistent between different yet similar product types.

Surface Transportation Noise

The sixth panelist in the workshop was Paul Donavan from Illingworth & Rodkin, Inc., a California consulting firm. He first discussed recent developments in highway noise that may affect future noise policy. He said that highway noise is generating more and more complaints from the public and that the attitudes of the public are becoming more sophisticated. For example, he said, the public realizes that there are solutions to highway noise problems beyond the traditional sound walls, such as the use of quiet pavements. He pointed out that there are some new projects and new funding for highway noise activities. Two of these are the Institute for Safe, Quiet, and Durable Highways (SQDH) , which has been established at Purdue University, and more recent efforts on quiet pavements. He said that pilot projects are underway in a number of states and that state departments of transportation have funded these projects. He also said that there was a recent AASHTO/FHWA "European Scan" tour on quiet pavements to reduce highway noise. (*This subject will be discussed in a later issue of* NNI. *– Ed*).

He said that the trends in highway noise appear to be toward higher levels. He cited higher volumes of traffic and the speed of traffic. He also said that more SUVs on the road create additional noise problems – not necessarily because of the engine noise, but because they tend to produce more tire noise.

He then invoked the source-path receiver model to discuss the overall problem. In regard to source levels, he gave some levels for current vehicle emissions:

Trucks—80 dB full throttle
Motorcycles—80 dB
Pocket retreads—prohibited
Light vehicle—80 dB full throttle (State and Local regulations)
Buses—80 to 86 dB (Local)
In-use limits (Local)

These levels address power train noise only. He said that it is well known at higher speeds the main source of highway noise is from the tire/pavement interaction. Tires as a source are not regulated and the question of pavement selection is a matter for state and local governments to decide.

The importance of the tire noise source is illustrated by the fact that quieter tires may generate levels as much as 5 dB below noisy tires. This reduction is in addition to any reduction that can be achieved by improvement of the road surface itself, and the reduction provided by barriers as discussed in the next paragraph.

He discussed briefly path noise control, which is mainly due to the construction of noise barriers. These decisions are generally state and local decisions with federal funds that are most easily procured for Type 1 barriers. Many states have Type 2 barrier programs (*The difference between Type 1 and Type 2 barriers was discussed in the opening plenary session of NOISE-CON 04; summarized in the NOISE-CON 04 Report in this issue.— Ed.*) There are few other methods for control of noise along the path.

He said that the idea of the flow from source to receiver in the classic source-path-receiver model is quite similar to the flow of activities from the federal to the state and local level. However, he said that if the overall process is not producing low enough levels to meet receiver based limits and reduce complaints from the public, there is no feedback system which can address shortcomings in the process. As a result, solutions can be sub-optimized based on the limited scope of any one agency or state/local jurisdiction. Such solutions may not be most cost effective and technically effective overall. Some of the questions that should be addressed at a high level encompassing the whole process are the following:

- Are the levels at the receiver low enough?
- Are the existing emission levels sufficient to meet local needs?
- Are quieter tires cost effective?
- Is the source-path-receiver model optimized?

Answers to these questions may provide guidance for future noise policy.

State Policies

The final speaker in the workshop was Harvey Knauer of Environmental Acoustics, Inc. He spoke of noise policy at the federal, state and local levels and the need for consistent noise policies in all of these areas. He said that federal policy generally arose because of the National Environmental Policy Act of 1969. State requirements, he said, sometimes mirror federal requirements, but the local noise ordinances and limits are often vague and sometimes archaic. He mentioned examples of some regulations containing octave-band frequency limits that have not been used for many, many years.

With regard to community noise issues, he expanded on the "vague and sometimes archaic" statement. He said that in addition to being inconsistent, many requirements lack resources for enforcement and there is often poor guidance concerning the regulations. Another serious issue, he said, was that the relationship between state policies and local ordinances is often unclear. As one example in local ordinances, he said that the term noise emission is sometimes used in documents but is very poorly explained. Even when local noise ordinances depend on state and federal documents, there is often little guidance for particular, and perhaps unique, situations. He said that he has seen many cases of "cloned" ordinances where, in some cases, even references to other states or localities have not been changed. He said that local jurisdictions frequently rely on consultants because there is no guidance available from government agencies.

. . . in addition to being inconsistent, many requirements lack resources for enforcement and there is often poor guidance concerning the regulations.

The next question is "What state and federal actions would be useful?" He suggested that there should be, on the federal level, a contact office or a regional center. He reminded the audience that under the old EPA noise regulations there was technical guidance and a noise office available to assist state and local governments with problems. He said that new assistance is not really needed for highway projects, but that the main issues are with community noise itself. Finally, he said that a federal action to update guidance for community noise levels and ordinances would be very helpful.

States could also provide contact offices on the state level to provide assistance. It would be very helpful for the states to provide guidance and material related to community noise issues. Another very important function, he said, could be to provide guidance for development and enforcement of local noise ordinances. In many states, there is currently little or no guidance at the state level and communities are forced to go back to some old EPA model noise guidance which may be out of date or irrelevant under certain conditions. He said it was important to consider the enforcement implications of any noise ordinance. In many cases, small towns do not have the expertise and/or the manpower to make objective measurements and often little or no funding to enforce the ordinance. As a result, it is important in many cases not to make rules extremely complex, as might be the case if frequency analyses were required.

There are other state issues, he said. One involves the scope of noise control studies. In some cases, he said, the studies are dictated by NEPA requirements, which may be well defined. In other cases, the project cost or the potential impact upon a community may influence the degree of analyses performed. One significant issue is to determine the scope of any study. Another issue, he said, was the phase-in of new noise models. There are many issues related to the introduction of new models. Finally, he said, that the development of noise barriers is a very important state function; and that guidance related to this work is being enhanced through the activities of Committee ADC40 on Transportation Related Noise and Vibration of the Transportation Research Board (TRB).

Discussion

A lively discussion followed the presentations. Here are brief summaries of some of the items discussed:

- There is both a lack of resources and a lack of knowledge on the state level. Some examples were given of equipment that had been purchased, never used, and is now in storage.
- Ten percent of the trucks tend to cause 90 percent of the problems on our highways.
- Noise is very often not a top priority when costs and benefits are considered.
- One should make more use of civil rather than criminal citations.
- There should be more vehicle inspections to uncover defective or missing mufflers, etc.
- Motorcycles should be required to carry an EPA stamp indicating an approved muffler. No stamp—the owner receives a ticket.
- We need authoritative information on criteria. Many of the criteria currently in use have been set for a very long time, and often the scientific base of these criteria is missing or incomplete.
- Many states and municipalities do not measure the same thing in the same way. This lack of communication between various governments and levels of government is a result of "stovepiping."
- More information is needed on who is making measurements and why. There is often very little consistency in different jurisdictions.
- Agencies such as NIOSH and OSHA should be doing more partnering.
- Noise issues in rural and suburban areas are not being well addressed.
- It is often difficult to define appropriate metrics for a specific situation.
- In many cases persons near a noisy plant are greatly affected whereas the benefit of that plant may be widespread. There should be a method to compensate people who are greatly affected by collecting money from those who receive a benefit.
- While in many cases the relationship between L_{DN} and L_{EQ} can be understood because of relatively well-known day/night patterns, in many cases it can be a problem when L_{EQ} (with suitable adjustments) is substituted for L_{DN}.
- A key question is when to compromise. There should be information on what is "right" versus what is "feasible." In many cases compromises must be made and the question is how soon in the development process these compromises should be made.
- American building codes tend to set minimal standards and, as a result, any consultant will generally recommend that transmission standards be set to much higher levels than the minimum.

Finally, there was a discussion on what the Federal government can do in the very near future. Some ideas were:

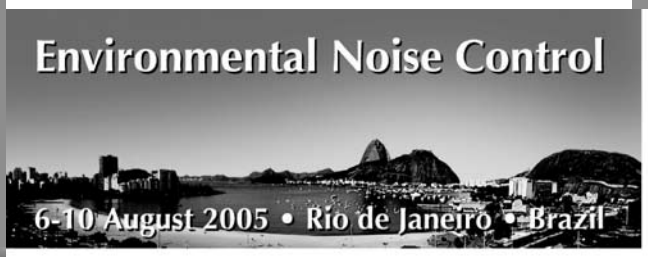
- Charge EPA to reactivate the Office of Noise Abatement and Control (ONAC) and tell them what to do.
- In the U.S. we should emulate EU activities.
- We need a clear statement from a leader in the noise control field.
- Currently there is not a strong enough demand for quiet from the public. We must ensure that government officials understand the demand for lower noise levels.
- We do not need new laws; it's a matter of putting dollars into the Federal budget.
- One very serious problem is that our noise problems tend to be local, but the solutions to these problems are not local. This causes great difficulty from a public policy perspective because the persons who are affected are often not able to implement the policy required to produce a solution.

More Information

For background information on national and international noise policy, readers should refer to a collection of papers on the CD-ROM produced for NOISE-CON 04. In addition to the papers presented at the conference and the proceedings of all NOISE-CON conferences beginning in 1996, noise policy papers have been collected from a number of sources and included on the CD-ROM. These are:

- A short paper on U.S. noise policy by Maling and Finegold prepared for INTER-NOISE 04.
- The papers in the special issue on national noise policy of *Noise Control Engineering Journal*, **51**(3), 2003 May-June.
- The papers in the special issue on national and international noise policy of *Noise Control Engineering Journal*, **49**(4), 2001 July August.
- The portion of the table of contents of the NOISE-CON 01 Proceedings that deals with noise policy, with further links to the individual papers.
- The paper, "An Overview of U.S. Noise Policy" by Finegold, Finegold, and Maling that was published in *Noise/News International*, **10**(2),51-63, 2002 June.
- The table of contents for the panel session papers and abstracts presented at INTER-NOISE 2002 with further links to the papers and abstracts. Most of the panel sessions dealt with noise policy issues.
- An explanation of the database of noise policy documents prepared by Finegold and Finegold. The database itself is on the CD-ROM in Microsoft Excel.

Information on the availability of this CD-ROM can be found on the INCE/USA page at the Atlas Bookstore, www.atlasbooks.com/marktplc/00726.htm. See also the announcement elsewhere in this issue.



RIO 2005 inter·noise

The 2005 International Congress and Exposition on Noise Control Engineering

Dear Colleagues,

It is with great pleasure that we invite you to participate in the INTER-NOISE 05, the 2005 International Congress and Exposition on Noise Control Engineering, being held on 2005 August 6-10. The Congress is sponsored by the International Institute of Noise Control Engineering (I-INCE), and is being organized by the Brazilian Acoustical Society (SOBRAC) together with the Iberoamerican Federation of Acoustics (FIA). The main theme of the Congress is "Environmental Noise Control," but technical papers in all areas of noise and vibration control are welcome. Short Courses will be held on August 6 and 7, with the official congress opening ceremony in the Congress venue hotel on August 7 at 17.30 hours.

This may be your first visit to South America but we doubt it will be your last. At this INTER-NOISE Congress, you will not only exchange information with your international colleagues, but you will also be able to explore the rich market for noise and vibration control engineering in South America. Brazil has many industrial products, such as passenger jet airplanes manufactured by EMBRAER, and the largest automotive assembly plants in the world—representing all the major car companies worldwide. And these are but two of the many categories of South American products for which noise and vibration technology plays a very important role regarding comfort and quality. Other categories include hydroelectric power stations (numerous), food industries, domestic appliance manufacturers, construction companies, and many others.

The noise and vibration market in South America is considered to be one of the largest expanding markets in the world. Recently, as a consequence of the workers' union activities and political changes, a government team of health and safety officers has been created which is now enforcing noise and vibration limits on industry. In addition to the new noise and vibration limits in the work place, the government has defined new environmental limits for noise and vibration in residential and other noise sensitive areas, and there is a need for product sound quality in many of the industries listed above. All of this requires measurement and analysis equipment, noise and vibration prediction tools, control materials, and manufacturing technologies for noise and vibration solutions. INTER-NOISE 05 will give you the opportunity to view and make contact with these emerging new markets on this large continent.

We expect a very complete exhibition of worldwide noise and vibration equipment, software, and materials for noise and vibration control. Pre-congress courses and distinguished speakers will provide information on up-to-date technologies in the field.

We therefore welcome you to INTER-NOISE 05, where you will have a fruitful and enjoyable time in beautiful, tropical Brazil.

Samir N. Y. Gerges
President of INTER-NOISE 05

Second Announcement and Call for Papers

The Brazilian Acoustical Society (SOBRAC)
Iberoamerican Federation of Acoustics (FIA)
The International Institute of Noise Control Engineering (I-INCE)

General Topics

Papers related to the technical areas listed below are especially welcome for presentation, but technical papers in all areas of noise and vibration are welcome at the congress.

- Assessment and Management of Noise
- Building Acoustics *(Façade, Regulation, Comfort, Insulation, Control, etc.)*
- Cost and Benefits
- Ducts and Pipes
- Effect of Noise *(Sleep disturbance, Health, Community Reponses, Combined Noise Exposures, etc.)*
- Environmental Noise from Power Plants
- Hearing Protectors
- Instrumentation and Standards
- Machinery Noise *(compressor, fans, etc.)*
- Metrology *(Instruments, measurements, standards, uncertainty, etc.)*
- Noise Barriers
- Noise Measurements Techniques
- Noise Policies *(Global, occupational, Environmental, Consumer Products, etc.)*
- Non-Acoustical Factors of Noise Annoyance
- Numerical Techniques *(FEM, BEM, IFEM, SEA, etc.)*
- Outdoor Noise
- Psychoacoustics
- Room Acoustics
- Signal Analysis
- Small Airport and Small Aircraft
- Sound Absorptive Materials
- Sound Power *(Measurements, Uncertainty, Standards, etc.)*
- Sound Propagation, Transmission and Scattering
- Sound Quality
- Sound Radiation
- Soundscape and Community Noise
- Transportation Noise *(Air, Road, Rail, Marine Vehicles, etc.)*
- Tyre/Road Noise
- Vehicle Noise
- Vibration Isolation and Damping
- Vibro-Acoustic Sources
- Virtual Acoustic Prototyping

Congress Venue

The Congress venue will be the SOFITEL Hotel on the beautiful Copacabana beach in Rio de Janeiro, Brazil. The hotel has excellent congress facilities, and most congress events will take place on one floor—except for a few meeting rooms in an easily accessible building, just 100 m away from the SOFITEL. The hotel is easily accessible by taxi from either the Rio International Airport, *Galeão*, or the city center airport *Santos Dumont*. Flight connections are avaliable between Rio de Janeiro International airport (Galeão) and Sao Paulo International airport (*Guarulhos*) in Sao Paulo City, Brazil. It is recommended that you do not use surface transportation between São Paulo City and Rio de Janeiro City, since they are 500 km apart.

The congress air carrier is VARIG airline, which is a member of the world's largest group, the "Star Alliance." Information about flights to Brazil may be found on the airline's web site, www.varig.com.br.

Exposition

An exposition of acoustical equipment, materials, software for noise control, other products for noise and vibration control, measuring instruments, and diagnostic equipment will be organized in the INTER-NOISE 05 Exposition. All companies in the field are welcome to participate in the Exposition. For an application form and map, go to www.internoise2005.org.br, then click on "Sponsorship/Exposition."

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Call for Technical Contributions

Papers related to the technical areas listed below are especially welcome for presentation at the INTER-NOISE 2005 Congress, but technical papers in all areas of noise control may be submitted for inclusion in the technical program. Abstracts must be submitted in the format enclosed with this announcement. The deadline for the receipt of the abstract is January 30, 2005. Information as to the papers' acceptance will be sent to the authors on March 14, 2005. Manuscripts for publication in the Conference proceedings are due on April 30, 2005.

Manuscripts must be prepared according to the format described on the Congress home page. Final manuscripts must be submitted in PDF format by April 30, 2005. All registrants for INTER-NOISE 2005 will receive a printed booklet containing all abstracts, the final technical program, and a CD that will include all INTER-NOISE 2005 papers. The Conference organizers reserve the right to schedule papers for the appropriate sessions and appropriate format (poster sessions versus oral presentation in technical sessions).

Abstracts can be submitted only through the registration link on the Congress web site. Please have the following information prepared for submitting an abstract on the web: www.internoise2005.org.br, clicking on " Registration/ Call for papers."

I. Paper title (20 words maximum)
II. Classification of subjects (click to chose)
III. First author's name, address (including country), telephone number, fax, end email (essential) for correspondence
IV. Additional authors' names and addresses (if any)
V. Indicate specific type of paper – Invited paper – Contributed Paper
   - Paper for poster session
VI. Text of the abstract, not exceeding 250 words. The text should include:
   - A brief description of the problem being addressed
   - Importance of the problem
   - Method of the development used for problem solving
   - Original contribution of the work
   - Conclusions

Important Dates

Abstract submission—January 30, 2005
Acceptance notification—March 14, 2005
Full page submission—April 30, 2005

Congress Secretariat and Contact Information

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6–10 August 2005 • Rio de Janeiro • Brazil

Rio de Janeiro City

Everyone knows about Rio de Janeiro's striking scenery with the world famous Copacabana and Ipanema beaches, lush tropical forests, tall granite peaks such as the famous Sugar Loaf and Corcovado mountains, warm year-round weather, international cuisine, rich culture, beautiful architecture and vibrant nightlife, not to mention the unparalleled warmth of its fun-loving inhabitants. But it is important for you to know that Rio de Janeiro also offers some of the world's most sophisticated congress and tourism infrastructures. It has a modern international airport (recently expanded), easy accessibility with most international airlines flying daily in and out of Rio from/to major world capitals.

A cosmopolitan metropolis, known worldwide for its scenic beauty and its natural resources, the city provides a harmonious and agreeable environment for its inhabitants and visitors, for both leisure and work which, combined with its infrastructure, makes Rio an important center for commerce and services, with the advantage of a modern and diversified industrial sector. The City of Rio de Janeiro recognizes that one of its main virtues is the kindness and hospitality with which its residents welcome all visitors.

Congress Activities

Congress participants and accompanying persons will have the opportunity to take part in the following activities organized for during and after the congress:

Social Program

- Opening ceremony and welcoming party with typical cultural presentation on Sunday, August 7 at 17.30 h.
- Congress dinner and show on Tuesday August 9
- Closing ceremony with Reception on Wednesday, August 10.

Sightseeing Tours

Tours in Rio de Janeiro during the congress and in Brazil and South America before and after the Congress:

- Corcovado
- Jeep Tour of the Tijuca Forest
- Sugar Loaf
- Museums
- Historical Rio
- Samba School
- Tropical Island Schooner
- Rio by Night

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Newton Sure Soeiro ..... *UFPA*
Jules Slama .....*UFRJ*
Ricardo E. Musafir.....*UFRJ*
Gustavo Mello ..... *UFPA*
Marcelo Magalhães .....*FORD*
Renata Guedes Sampaio .....*FORD*
Alice Helena B. Rodrigues .....*FORD*
Paulo Henrique T. Zannin..... *UFPR*
Mauro T. Sakita .....*INPE*

NOISE-CON 04 Report

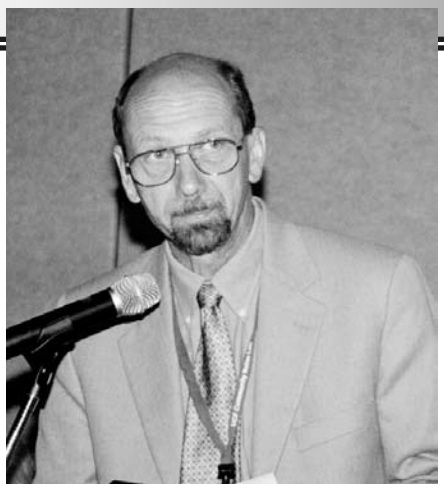
2004 INCE/USA President Joseph Cuschieri opens NOISE-CON 04.

NOISE-CON 04 the 2004 National Conference on Noise Control Engineering opened at the Wyndham Hotel in Baltimore, Maryland, USA, on Monday, July 12, 2004. The meeting was opened by INCE President Joseph Cuschieri who welcomed all of the delegates to the meeting on behalf of both the Institute of Noise Control Engineering and Committee ADC40 (Transportation Related Noise and Vibration) of the Transportation Research Board. He said that organizing a joint meeting between the two organizations was complex, but that he was sure that the meeting will lead to an excellent exchange of ideas. "This," he said, "is the 20th NOISE-CON meeting, a series that started in 1973." He particularly thanked the General Chairman of the conference, Courtney Burroughs, who represented the Institute of Noise Control Engineering and Kenneth Polcak of the Maryland Department of Transportation who chaired the meeting on behalf of TRB. He also thanked Richard Peppin who managed the exposition at the conference. "This exposition," he said, "is one of the largest in recent history." He also thanked Pam Reinig, Director of the INCE/USA business office and conference coordinator for all of her staff work on behalf of the conference. He also thanked Paul Schomer, Executive Director of INCE/USA, for his role as liaison between the organizing committees in Maryland and at Penn State and the business office at the Iowa State University. Finally, he showed a list of Sustaining Members of INCE/USA. He showed a list of eighteen Sustaining Members, many of them with links indicated to their own sites on the Internet. He thanked all of the Sustaining Members for their support and invited other organizations represented at NOISE-CON to become Sustaining Members of the Institute and thereby become even more well known to users of equipment and services in the field. He announced that there would be a planning meeting for NOISE-CON 05, which will be held in Minneapolis, Minnesota, in October of 2005. The purpose of the meeting was to help organize special sessions. He then introduced the General Chair of NOISE-CON 04, Courtney Burroughs, who gave an overview of the activities at the meeting. He explained the locations of sessions and the exhibition as well as the dinner cruise, which took place on Tuesday evening, July 13, and he gave instructions to authors for the meeting. Kenneth Polcak, Chair of ADC40, the Committee on Transportation-Related Noise and Vibration, was then introduced; he pointed out that this was the first ever joint meeting between the two organizations and that he hoped that there would be a good exchange of ideas between the two groups. He announced that a tour of Maryland noise barriers would take place for those interested in barrier design.

He then introduced the plenary speaker for the morning session, Charles Adams. Charles Adams is the Director of the Office of Environmental Design in the Maryland State Highway Administration. Mr. Adams has been involved in activities in Maryland for many, many years and said that he would like to give the attendees his view of the evolution of the Maryland noise program from the early 1970s until now.

He started with the passage of the National Environmental Policy Act (NEPA) in 1969 and the involvement with the Federal Highway Administration (FHWA) shortly after that. He said that he has been involved with the Maryland program since the very beginning; the first programs being Type I programs around the capital beltway. *(A Type I barrier is built as part of a new highway construction project whereas a Type II barrier is built along an existing highway.—Ed.)*

He said that the first noise barrier was built with surplus soil as an earth berm,



NOISE-CON 04 General Chair Courtney Burroughs reviews the agenda for the conference.

and that people seemed to be quite happy with that. After the Type I Program was started, he worked on the Type II programs for Maryland without guidelines in an unfunded program but with a great deal of interest. By the early 1980s, the first Type II barriers were built; and by 1987 a noise policy – two pages – was in place. He said that the requirement that communities pre-date the highway to be eligible for the program predated the federal program so that the two programs, over the years, have been in alignment. The program was funded from 1987 to the mid-1990s with a mix of 80 percent and 20 percent local funding. "There were," he said, "complaints from elected officials and communities concerning the criteria for sound barrier approval and it was decided that a new policy was needed." The new policy was reviewed by ten persons in the Maryland legislature and revised in 1998. He said that the original approved costs for noise barriers was $40,000 per residence in the period 1987 until 1997. That cost threshold has now been raised to $50,000 per residence but the average cost over many barrier projects is around $30,000 per residence. The 20 percent local funding criteria was included in the new policy, and additional consideration was included related to historic sites and districts; and information on cumulative effects of noise was added that made more communities eligible for barriers. He said that the original Type I program was relatively easy to develop but that the Type II program has, over the years, been much more difficult.

He said that the new policy also required counties to have noise control ordinances regarding new residential development adjacent to state highways, and that the revision included a second threshold level of 72 dB too take care of very high noise situations. "Now," he said, "there is another round of policy discussions which include a better definition of historic places – defining more clearly the situation with regard to properties that are on the National Register of Historic Places and those that are historic sites." He said that the threshold has now been raised to $100,000 per residence; but, although this seems like a major increase, this reflects the total cost of a Type II sound barrier, factoring in all of the associated construction costs. In the new policy there is also discussion about the 72 dB threshold criteria; it does not necessarily apply to a single residence but it is more related to high noise levels across the community.

He also said that there has been work on noise control for arterial roads in contrast with most work that has been done on interstate highways. He said that for a goal of 7-10 decibels of noise reduction, a 25-foot highway barrier might be needed. He said it is felt that the program has to be different from the interstate program so that perhaps less barrier performance will be accepted, but that the scale of the barriers will be more in tune with neighborhood requirements. He said that in the last five or six years more emphasis has been placed on the appearance of barriers. He said that the previous governor of the State liked bricks as noise control barriers as they exist in some places in North Carolina. He said, however, that some of those bricks were donated, so that the cost was lower than if the brick were purchased. He said that the State is looking into more artistic designs for the barriers, using faux brick and stone patterns on some of the newer projects.

He then turned to the costs of the noise barrier program. He said that $86,000,000 has been spent on the Type I program from the mid 1970s to 1993, and that amount may increase by 50 percent as an inter-county connector road is developed. He said that $141,000,000 has been spent on Type II barriers with another $40,000,000 eligible to be spent but, to date, without matching grants. He said that we are near the end of the Type II program with total costs in the range of $132,000,000 in the period 1996 to 2002.

In response to some questions, he said that at one time the State did work on quiet

Left: Kenneth Polcak, Chair of TRB ADC40, welcomes attendees to the joint meeting on behalf of ADC40.

Right: The first plenary lecture is given by Charles Adams of the Maryland State Highway Administration.

pavements, but not at the present time. He said that one large issue is the performance of porous road surfaces in the wintertime and pointed out that Arizona, a state that does not have winter problems in many areas of the state, has an active program on quiet road surfaces. In response to a second question concerning the community's view of noise barriers, he said that surveys generally show that 90 percent of persons who respond are happy with the barriers; and that there are very few telephone calls when the barrier job is completed.

Parallel sessions continued in the morning and afternoon of the first day. Late in the afternoon, the NOISE-CON 04 exposition opened with a reception in the exhibit hall. The exposition, ably managed by Richard J. Peppin drew 47 exhibitors, the largest in NOISE-CON history. The exhibitors and a description of the products and services offered may be found in the Product News Department in this issue.

Before the plenary lecture on Tuesday, July 13, INCE/USA held an awards ceremony. The INCE Distinguished Noise Control Engineer award was given to Eric Ungar, and three student prizes were given for papers presented at the conference. Additional information may be found in the INCE Update Department in this issue.

The plenary lecture on Tuesday, July 13, was given by Wendell Miller of Boeing Commercial Airplanes. The title of his talk was "Airplanes 201-Commercial Aviation." He began by saying that the goal of the Boeing Company is to meet the needs of all of its stakeholders, its customers, the airline passengers, the airlines, and the needs of persons on the ground. "Safety," he said, "is the Number 1 criterion for all design." He spoke of many issues that have to be faced in the design of aircraft, but two key points were emphasized. First, control of noise during approach and on takeoff, and second, the emissions created by the aircraft, these being pollutants, chemical emissions, and other emissions. He said that a great deal of effort is going into the design of a new Boeing aircraft, the 7E7. The key environmental challenges include the operational aspects of the design, for example, fuel efficiency, emissions, and noise levels both, as mentioned above, during approach and takeoff, but also inside the aircraft. There are other issues to be faced, both on the ground during operations and in the factory during the construction of the aircraft; but these areas were not emphasized in his presentation. He said that a great deal of progress has been made by the industry in engine design and in the aerodynamics of the aircraft so that the same thrust of the engines can produce a larger payload for the customer.

The second plenary lecture was given by Wendell Miller of Boeing Commercial Airplanes.

Another issue is air traffic management, and he said that Boeing has a group developing air traffic management procedures with potential business all over the world. He mentioned a new development in a Boeing research center in Madrid – a demonstration light aircraft powered by fuel cells that has the potential for very significant noise reductions for APUs on the ground. However, he said, the current work involves, in addition to work on the aircraft itself, work on flight operations and the management of air traffic. He showed a chart on certification of the noise emissions of aircraft and the international requirements for certification. He also gave an update chart on noise versus time for a very wide variety of aircraft over the period beginning in about 1950. He showed data on the significant reductions in the noise footprint from the early aircraft engines and up to modern engines.

He divided engine noise emissions into four categories, the inlet fan that produces both tonal and broadband noise, the compressor, the turbine itself, and the jet exhaust which produces low-frequency sound. He said that the jet noise emissions are not as important as they were in early aircraft designs. He said that previously engines with a high jet exhaust caused problems that had been largely solved by high-bypass ratio engines, but that the overall noise reduction in today's world is more challenging because the sources of noise are more numerous. He mentioned the low-speed performance of engines, the aerodynamic design of the airframe, which is important in producing lift, and therefore increased passenger capability, without increasing the noise from the airframe itself. He also mentioned the importance of the acoustics of engine cells in reducing the fan noise from the engine. He said that new designs for acoustical treatment in the engine cell can produce a significant increase in the area of acoustical material in the inlet.

He turned briefly to exploratory technologies where he discussed the experimental inlet technologies, particularly the use of larger areas of acoustic treatment in the engine cell and experimental designs of chevron nozzles to control the jet exhaust plume and reduce the noise level. He showed a video of an aircraft with experimental nozzle chevrons installed that has been tested at a test site in the upper mid-West.

One of the techniques for source localization in the aircraft is the use of an "acoustic camera," basically a phased array that can identify noise sources and lead to improved wing design and minimization of drag. He said that these localization procedures have been used for technical evaluations in a controlled situation as well as operational measurements by NLR at Schiphol Airport in The Netherlands.

With regard to operations on the ground, he said that a great deal of effort has gone into operational procedures—particularly the continuous descent technique which is quite different from the standard technique which involves a rapid descent and a "flat" approach to an airport. He showed the possible reductions in noise level for these two approaches and pointed out that both noise reduction and reduced fuel consumption can occur when the continuous descent model is used.

He then turned to interior noise in the aircraft and its effect on the crew as well as the passengers in the forward cabin, the mid-cabin, and the aft cabin. One of the major goals is to produce sound absorption in the cabin with very low weight. All aspects of the interior noise sources and possibilities for sound absorption have to be considered. For example, design of cooling systems, sound absorption near stow bins, sound absorption in the side walls, carpets, and ceiling panels. The goal of efficient control in the cabin is, of course, for passenger comfort as well as a safe working environment for the crew.

One other important consideration is sound quality engineering. He said that it is very important to make sure that there are no "inappropriate sounds" generated in the aircraft that might concern the passengers.

In summary, he said there are many environmental challenges in the development of aircraft. They involve primarily safety but, of course, economy and compatibility both in terms of the interior noise of the aircraft as well as the noise heard on the ground.

As on Monday, parallel sessions continued for the morning and the rest of the day. In the afternoon, the First Annual Workshop on Noise Policy Developments was held. The presentations at the workshop have been summarized and appear as a feature article in this issue.

In the evening, all registrants and exhibitor personnel were invited to a dinner cruise of the Baltimore harbor on the ship, the *Bay Lady*. More than 400 persons participated, and the event was a great success.

The third plenary lecture was given on Wednesday, July 14, by Timothy A. Brungart of the Applied Research Laboratory, Pennsylvania State University. The title of his presentation was *Fan Noise*.

Timothy Brugart of The Pennsylvania State University presents the third plenary lecture.

He pointed out that fans are used in an extremely wide range of applications and an equally wide range of sizes – from personal computers for cooling their central processor units (CPUs) through power plants in their cooling towers. Even wind generators with diameters of 30 meters or more, he said, can be considered to be air-moving devices. He discussed the different types of fans available – centrifugal fans, which throw air radially from the unit, both with a scroll and without, the latter in the form of a motorized impeller. He described the different blade shapes that are commonly used in centrifugal devices. He then described the various kinds of axial-flow fans from the common propeller-type cooling fan used in households through tube-axial and vane-axial devices used in many small ventilating systems. One parameter, he said, that is key to the selection of a proper fan for a given application is the specific speed. The specific speed, N_s, is defined as

$$N_s = n \times \frac{q^{1/2}}{p^{3/4}}$$

where n is the fan rpm, p is the static pressure rise in N/m^2 and q is the volume flow rate in m^3/s. He showed that different types of fans operate the best in specific ranges of specific speed and presented a chart that showed which type of fan is best for any particular specific speed range.

He then discussed briefly the noise characteristics of centrifugal fans versus axial fans. Centrifugal fans tend to produce most of their noise at low frequencies and exhibit a continuous reduction in level with increasing frequency. Axial fans, on the other hand, produce most of their noise at mid-frequencies and exhibit a reduction in level toward both higher and lower frequencies.

He then discussed the sources of noise in small and medium size fans. He said that the dominant noise is almost always dipole in nature. That is, it is caused by force fluctuations that may be generated from a number of sources. He then stepped through some of the sources in fans. One important source is turbulence ingestion. Turbulence at the inlet of an air-moving device causes variations in the angle of incidence with which the flow meets the blade, and that variation causes a fluctuating lift force on the blades which, again, produces noise. He also discussed trailing edge noise, particularly edge discontinuities in fan blades that cause pressure fluctuations to be radiated as sound that would not be radiated in the absence of the edge. He also discussed the bluntness of trailing edges and the vortex shedding that can produce additional noise. He also discussed flow separation from the blades—a typical characteristic of centrifugal more-so than axial-flow fans—that causes random force fluctuations on the blade and, hence, radiation of sound. He pointed out that noise generated by the turbulent boundary layer on fan blades is generally quadrupole in nature and, hence, at low Mach numbers, a very inefficient source of sound. He cited some experiments by Sharland in 1964 that

indicated that the turbulent boundary layer noise could be as much as 45 decibels below the noise produced by other sources.

Having finished the information on broadband noise, he then turned to radiation of discrete frequencies. He said that periodic flow variations at the inlet of axial flow air-moving devices generally leads to tonal radiation and in centrifugal devices, the interaction between the impeller and the cutoff in the scroll leads to discrete frequency components in the spectrum.

He then turned to prediction of sound radiation and presented the basic prediction method of Madison in 1949. He said that the sound power level, L, can be expressed as

$$L = L_s + 10 \log (p^2/p_o^2) + 10 \log q/q_o$$

where $p_o = 1$ N/m^2, $q_o = 1$ m^3/s and L_s is the specific sound power level. He pointed out that there is no spectral information in the original Madison formulation, but that the above equation leads to a sound power level which varies as the square of a fan diameter and a fifth power of the speed.

He then turned to prediction methods for axial devices and said that it was found by Wright in 1982 that the maximum blade relative velocity in a blade row is the most important predictor of the noise level. He showed examples of where Wright attempted to collapse his measured data with other parameters pertinent to fan noise generation and that Wright's maximum velocity appeared to collapse the data better than any other parameter. He also discussed methods for prediction of levels that are discussed in the ASHRAE handbook.

The next subject was fundamental calculations of noise emission from blades in the presence of flow and discussed the single-blade source superposition method and the numerical analysis methods of Ffowcs-Williams and Hawkings. In the latter case, the pressure in the far field is related to the force fluctuations exerted by the blade on the surrounding fluid; and, if these force fluctuations can be determined, the radiated noise can be calculated.

He then turned to practical examples of noise reduction in specific devices. He first used vacuum cleaners as an example, and said that one of his projects was to reduce the level of a very strong tone in a vacuum cleaner but at essentially no cost and no loss in cleaning power. He said that it was found that the interaction between the electric motor cooling fan and the motor mount was a key source of noise and was able to produce significant reductions in the radiated noise by mounting the motor in an alternate fashion. A second solution, he said, involved design of an impeller with unevenly spaced blades. Even though this solution produced higher overall noise levels, it was preferred 3:1 by persons who listened to the noise and made judgments. This, he said, was an example of sound quality engineering. Finally, he discussed noise reduction in a military vehicle and said that the source identification process lead to the fact that evaporator fans in the rear of the vehicle were a major noise source. He said that there were major problems with the design of the fans, and he outlined changes made for replacement fans of better design. He said that the sound power level of the fans was reduced by 11-14 dB in the laboratory, but that somewhat smaller reductions were obtained in the field. He said that other treatments that involved additional path control were able to make additional reductions in the noise of the vehicle.

Finally he gave some design guidelines for low-noise fans.

1. The mean flow distortions and turbulence levels ingested into the air-moving device should be reduced as much as possible.
2. The system losses must be minimized.
3. The correct fan must be selected and operated near its point of maximum static efficiency.

He than said that other measures can be used to control the noise by controlling the transmission path from the fan to the receiver.

The opening session on Wednesday, July 14, also served as the final plenary session of the conference. INCE/USA Joseph Cushieri gave a good summary of current activities. This summary may be found in the INCE Update Department in this issue. He then introduced Jerry Lauchle, President-elect of INCE/USA, who discussed the activities of the evaluation committee. In INCE/USA, each President-elect is charged with chairing an evaluation committee to examine INCE activities and to recommend changes that may be implemented during the following year. He said that a questionnaire will be distributed to a number of INCE Members to assist with the evaluation process.

Left: Jerry Lauchle encourages participants to participate in the INCE/USA evaluation process.

Right: Dan Kato, General Chair for NOISE-CON 05 invites the participants to attend the next conference in Minneapolis

Courtney Burroughs then thanked all of the persons who made NOISE-CON 2004 a success. He particularly thanked Steve Hambric who served as the chair of the Technical Program Committee, Richard J. Peppin, who was the Exposition Manager and produced what was the largest NOISE-CON exposition in history. He also thanked the staff at the Iowa State University, particularly Pam Reinig, Gloria Hill, and Denise Miller for their assistance in managing the conference.

The next speaker was Kenneth Polcak of the Maryland Department of Transportation who acted as the general chair for the TRB/ADC40 meeting. He emphasized that there was excellent cooperation between INCE/USA and the TRB group. He said that when a smaller group meets with a larger group there is always some concern about being "swallowed up" by the larger group; but in this case that did not happen. He particularly thanked two gold medal sponsors of the TRB group. He emphasized again the good cooperation between our two organizations and said that although this was the first joint meeting, it will certainly not be the last.

President Cuschieri then introduced Dan Kato who is the General Chairman of NOISE-CON 2005 which will be held in Minneapolis, Minnesota on 2005 October 17-19. The co-chair of the meeting will be Robert J. Bernhart of Purdue University, West Lafayette, Indiana. The technical program duties will be shared by Patricia Davies and Stewart Bolton, both of Purdue University. General Chair Kato invited all attendees to attend the 2005 conference. The Announcement and Call for Papers is the following article in this issue.

There were 333 registrants at the meeting, including 31 students. In addition, 37 accompanying persons participated in the social events.

The CD-ROM prepared for the conference was distributed to all attendees and exhibitors. In addition to the papers presented at NOISE-CON 04, the CD-ROM also contains the papers presented at the following meetings:

- NOISE-CON 03
- NOISE-CON 01
- NOISE-CON 00
- NOISE-CON 98
- SQS 98
- NOISE-CON 97
- NOISE-CON 96

In addition, a collection of papers on noise policy is included on the CD-ROM. The collection is described in the last section of the article on the First Annual Workshop on Noise Policy Developments in this issue. Information on the availability of this CD-ROM can be found on the INCE/USA page at the Atlas Bookstore, www.atlasbooks.com/marktplc/00726.htm. See also the announcement elsewhere in this issue.

NOISE-CON 2005

ANNOUNCEMENT AND CALL FOR PAPERS

Submission of Abstracts
2005 May 01

Submission of Papers
2005 June 17

Reservations for Hotel
(to be determined)

Overview

NOISE-CON 2005, the National Conference on Noise Control Engineering, will be held at the Hilton Minneapolis Hotel in Minneapolis, Minnesota, October 17-19, 2005. This is the 21st in a series of conferences on noise control engineering, which have been held in the United States since 1973. The conference is being organized by the Institute of Noise Control Engineering of the USA (INCE/USA) and will be a joint venture with the 150th meeting of the Acoustical Society of America (ASA). The ASA meeting will be October 17-21 at the same hotel. Most of the ASA Noise Technical Committee and Architectural Acoustics Technical committee sessions, and other relevant ASA sessions, will be part of the joint NOISE-CON and ASA conference to form an exciting and coherent program of noise control related sessions. The sessions will reflect the overlap in membership between the two organizations and the spirit of cooperation that led to the decision to have this joint meeting.

There will be one registration fee for both conferences, so NOISE-CON 2005 participants are encouraged to take the opportunity to learn about some of the work being done in other areas of acoustics, not usually part of regular NOISE-CON technical programs, by attending the sessions taking place on Thursday and Friday.

NOISE-CON 2005 will open on Monday. October 17th, at the Hilton Minneapolis with a morning plenary session followed by parallel sessions throughout the day. The exposition will open Monday evening with a reception. Plenary sessions followed by parallel technical sessions are also planned for October 18th and 19th. The Awards and NOISE-CON 2005 Closing Ceremony will take place with the ASA Awards Ceremony on Wednesday afternoon. In addition, the INCE fundamentals and board certification exams will be offered.

At NOISE-CON 2005, special emphasis will be placed on INCE/USA technical activities with opportunities for each INCE technical group to hold meetings during the conference. The goal is to strengthen the technical activities program of INCE/USA and to encourage more participation in the technical initiatives being taken by the International Institute of Noise Control Engineering (I-INCE). I-INCE is an international organization composed of 46 member societies that are either institutes of noise control engineering or acoustical societies.

The 2005 National Conference and Exposition on Noise Control Engineering

TECHNICAL PAPERS in all areas of noise control engineering are welcome. Special topics of interest include:

- acoustical instrumentation,
- measurement techniques and test facilities,
- transportation noise,
- tire-pavement noise,
- building and community noise
- noise control and soundscapes,
- industrial noise control and hearing conservation,
- hospital noise,
- business machinery and office noise,
- low-noise product design and sound quality,
- power plant noise,
- noise sources,
- airborne and structure-borne noise paths,
- passive and active noise and vibration control,
- acoustical materials and treatments,
- sound visualization,
- noise policy,
- modeling and simulation software, and
- mining noise.

A MAJOR TECHNICAL EXHIBITION will be held at this joint NOISE-CON 2005 conference and 150th Meeting of the ASA. The exhibits will include computer-based instrumentation, multi-channel analyzers, sound quality systems, software for noise and vibration control analyses, acoustical materials, passive noise control devices, active control systems, and other products. Details regarding the exposition can be obtained from Richard J. Peppin of Scantek. Inc. who is the exposition manager.

Conference Venue

Minneapolis and St. Paul might be called twins, but they are certainly not identical. Minneapolis claims the greater number of attractions and businesses, while St. Paul functions as the state capital. Founded 20 years and 10 miles apart, the cities have been frequent rivals, but over the years they have shared equally in the riches the area has to offer. In the midst of lakeside resorts, farm communities and river towns, they form a vibrant metropolis rich with Fortune 500 companies, a thriving art and theater scene and professional sports teams. These elements of industry, culture and recreation have shaped the Minneapolis and St. Paul metropolis into one of America's most livable urban areas.

The Hilton Minneapolis hotel is located in the heart of downtown, connected by skyway to many of the city's finest attractions. Orchestra Hall is next door and The Guthrie Theatre, Walker Art Center, fabulous shopping and superb restaurants are just a short stroll away. The Hilton Minneapolis hotel is an elegant Victorian brick building that rises 25 stories above the center of one of America's top cities.

The nearby Walker Art Center is nationally renowned for its permanent collections, including 100 years of sculpture and 20th-century art and photography, and exhibitions of contemporary art. The Minneapolis Sculpture Garden, which covers more than 7 acres at the Walker Art Center, has more than 40 imaginative sculptures by leading artists in media ranging from wood to granite.

Other area attractions include:

- Mall of the Americas
- Minnehaha Falls and Park. This waterfall along the Mississippi River inspired Henry Wadsworth Longfellow's poem "The Song of Hiawatha" and composer Antonin Dvorak's New World Symphony.
- The Basilica of St. Mary is the oldest basilica in the U.S. and one of the finest examples of beaux-arts architecture in the country (it's on the National Register of Historic Places).
- Foshay Tower, an elegant art-deco-style building, modeled after the Washington Monument, was the first skyscraper west of the Mississippi River.

NOISE-CON 05 General Chair
Daniel J. Kato
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Conference Co-chair
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Technical Program Chair
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INVITATION TO SUBMIT ABSTRACT OF PAPERS

Instructions for Preparation of Abstracts

NOISE-CON 2005 abstracts (200 words) will be submitted to the INCE business office by May 1, 2005, which is ahead of the ASA abstract deadline. The INCE staff will upload the abstracts into the ASA database, so you will not have to submit twice. The papers (4-8 pages) will be due the same date as the ASA abstract deadline (June 17, 2005). This will allow for better coordination between the two conferences' technical programs. Details for abstract and paper submission will be posted on the INCE Web site (http://www.inceusa.org).

Text of the Abstract

An abstract of not more than 200 words is required for each paper, whether invited or contributed. Abstracts longer than 200 words will be edited or truncated. For abstracts submitted by postal mail, the text of the abstract should be double spaced. The abstract should include **(1)** a brief description of the problem being addressed, **(2)** why the problem is important, and **(3)** a brief description of the approach to and contribution of the work to be presented in the paper. There should be no special characters or equations in the abstract.

INCE/USA Subject Classification: Follows the abstract text. The Subject Classification numbers are given on the next page of this announcement.

Abstract Due Date

2005 May 01

Address for Abstract Submission

ibo@inceusa.org
or
NOISE-CON 05 Secretariat
INCE/USA Business Office
212 Marston Hall
Iowa State University
Ames IA 50011-2153

NOISE-CON 2005 Reply Coupon

Please complete this form and submit to the NOISE-CON 05 Conference Secretariat, INCE/USA Business Office, 212 Marston Hall, Iowa State University, Ames, IA 50011-2153. Form can be faxed to (515) 294-3528.

☐ Prof. ☐ Dr. ☐ Mr. ☐ Mrs.

Family Name _____ First Name _____

Institute/Organization _____

Postal Address _____ Fax _____

Telephone _____ E-mail _____

Position _____

☐ I am interested in attending NOISE-CON 2005.
☐ I am interested in presenting a technical paper.
☐ Please send me information on the equipment exposition.
☐ I would like to organize a special session for NOISE-CON 2005.
If checked, the subject area of the session could be: _____

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INCE/USA and I-INCE Classification of Subjects in Noise Control Engineering

General

00 General
01 International INCE
02 International INCE *(continued)*
03 International INCE *(continued)*
04 International INCE *(continued)*
05 Publications *(other than technical articles)*
06 History and philosophy
07 Education
08 Noise programs
09 Definitions and descriptors

Emission: Noise Sources *(noise generation and control)*

10 General
11 Noise-generating devices *(including components and subassemblies)*
12 Stationary noise sources *(noise generation and control)*
13 Moving noise sources including aircraft *(noise generation and control)*
14 Specialized industrial machinery and equipment

Physical Phenomena

20 General
21 Physical mechanisms of noise generation
22 Natural sources of noise
23 Propagation, transmission, & scattering of sound *(general wave equation)*
24 Sound propagation in the atmosphere
25 Sound propagation in enclosed spaces
26 Sound propagation in ducts

Noise Control Elements *(for path noise control)*

30 General
31 Barriers and screens, shielding
32 Enclosures for noise sources
33 Sound isolating elements *(including panels, partitions, and curtains)*
34 Filters, mufflers, silencers, and resonators *(conventional types)*
35 Absorptive materials
36 Hearing protective devices
37 Noise attenuation and transmission in ducts
38 Special treatments *(including active noise control)*

Vibration and Shock: Generation, Transmission, Isolation, and Reduction

40 General
41 Characteristics of sources of vibration and shock
42 Vibrating surfaces and structures *(beams, plates, shells)*
43 Propagation in structures *(solid-borne noise)*
44 Balancing of rotating and reciprocating machines
45 Reduction of impact forces; shock isolation and absorption
46 Vibration isolators and attenuators
47 Vibration-clamping materials and structures
48 Vibration generators, shake tables
49 Effects of vibration and mechanical shock *(on man, on structures)*

Immission: Physical Aspects of Environmental Noise *(multiple sources and multiple paths)*

50 General
51 Building noise control
52 Community noise control
53 In-plant noise control
54 Shipboard and offshore platform noise control
55 Outdoor plant noise control design and construction
56 Noise surveys

Immission: Effects of Noise

60 General
61 Perception of sound
62 Physiological effects
63 Psychological effects
64 Effects of noise on physical structures
65 Effects of noise on domesticated and wild animals
66 Sociological effects; community reaction to noise
67 Economic effects
68 Environmental impact statements
69 Criteria and rating of noise

Analysis

70 General
71 Instruments for noise and vibration measurements
72 Measurement techniques
73 Test facilities *(design and qualification)*
74 Signal processing
75 Analytical methods
76 Modeling, prediction, and simulation
77 Sampling and quality control procedures
78 Audiometry, dosimetry, and hearing measurements
79 Psychoacoustical evaluations and testing

Requirements

80 General
81 Standards
82 Federal government legislation and regulations
83 State and local legislation and regulations
84 Other legislation and regulations
85 Ordinances, including zoning requirements
86 Building codes
87 Specifications
88 Auditing, enforcement, and certification
89 Labeling

The continuous descent approach (CDA) is being studied.

USA

MIT-led Team Cuts Noise From Landing Planes

Most attempts to reduce the noise associated with landing aircraft are expensive—modifying aircraft, soundproofing buildings, buying and demolishing homes. But now, an innovative MIT-developed landing procedure is reducing the noise that planes make when landing, while also cutting aircraft operating costs. Associate Professor John-Paul Clarke and colleagues first tested the new technique at Louisville International Airport in Kentucky in 2002; they found that it cut noise by almost 50 percent and reduced fuel consumption during landing by about 500 pounds. Since then they have analyzed its application to other airports, including Logan International in Boston, Sacramento International in California, and Gatwick near London. Currently the team is developing a certified procedure that the United Parcel Service (UPS) intends to use on its planes in Louisville and Sacramento.

Community concerns about aircraft noise are constraining the growth of aviation. Because of the increasingly active legal opposition to airport expansion by residents in adjacent communities, many runway expansion projects have been delayed or abandoned. "The net effect is that fewer than five additional runways have been built at the 30 busiest U.S. airports within the last 10 years, resulting in greater delays and congestion," said Clarke, of MIT's Department of Aeronautics and Astronautics.

A number of measures already have been adopted to reduce aircraft noise. These include phasing out noisier aircraft in favor of planes with quieter engine technology; enforcing nighttime curfews on some or all aircraft; and insulating (or purchasing and demolishing) homes that are severely affected by aircraft noise. While these measures have reduced the impact of aircraft noise, they have not lessened the opposition to airport expansion. Given the relatively wide implementation of the measures, and the potential capacity crisis in the national and international airspace system, there is a critical need for new solutions. Clarke and colleagues from Boeing Commercial Airplane Group, Boeing Air Traffic Management, NASA Ames Research Center and NASA Langley Research Center believe that one such solution is to change the way aircraft are operated when they're close to airports. To validate their ideas, they designed and flight-tested a continuous descent approach (CDA) procedure for the specific airport and airspace constraints at Louisville International Airport.

Noise is an ongoing problem at Louisville mainly because it's the primary hub for UPS, which lands more than 90 large planes each night. Most of these landings occur between midnight and 2 a.m., when other background noise is low and residents in surrounding communities are trying to get to sleep or have just fallen asleep—the period when it's easiest for someone to be awakened by noise, according to experts. In a standard approach, the plane is brought down in stages—descending and leveling off several times before landing—with the final level-flight segment only 3,000 feet above the airport. Each time an aircraft descends from an intermediate altitude and levels off, thrust must be applied to maintain level flight. "And increasing thrust increases noise," Clarke said. The resulting noise impact on the ground is even greater in communities such as those in southern Indiana, where the nearby residential elevation is more than 850 feet higher in relation to the local runways than the residential elevation in Louisville. The new procedure addresses both the thrust and elevation issues by keeping planes higher for a longer period and then bringing them down in a continuous descent. The aircraft are both quieter (because they are operating at lower thrust levels) and higher as they pass over the affected communities.

For eight nights, two UPS Boeing 767 airplanes on their way to Louisville from West Coast cities were selected (once all aircraft were airborne) to participate in the flight test, based on their scheduled arrival time in Louisville. Both aircraft

needed to be close enough in the sequence that the weather conditions would be the same during their approaches. One 767 was instructed to perform the standard approach. The other 767 was instructed to perform our CDA continuous-descent procedure: descending on a two-degree flight path angle and then a three-degree instrument landing system glide slope on the final approach course. The performances of the aircraft, pilots and flight management system were measured using two separate systems—the aircraft tracking system installed at Louisville as part of an FAA technology demonstration project, and the onboard flight data recording system. Noise was measured using 14 microphones at seven locations in communities in southern Indiana. "The results show quite convincingly that the CDA procedure reduces noise between three and six decibels at the measurement locations—in line with our predictions—and that there are significant noise benefits for residents living approximately 10 to 30 miles off the end of airport runways when this approach is widely employed," Clarke said. For reference, a three decibel difference is noticeable to the average person, while a reduction of 10 decibels is perceived by the human ear as a 50 percent reduction in noise.

Another advantage of the CDA procedure is that it is more fuel-efficient. Because the planes are spending more time at higher altitudes in less dense air and less time in fuel-wasting slow flight configuration, aircraft performing the CDA used approximately 500 pounds less fuel than those using the standard approach procedure.

In addition to testing the procedure at other airports, Clarke's team has been designing cockpit displays and tools for air traffic controllers to enable widespread introduction of the CDA approach.

The work is supported by the FAA and NASA with matching contributions from Boeing and UPS.

CDA reduces noise and saves fuel.

Asia-Pacific News

Marion Burgess, Asia-Pacific Editor

New noise projects in Japan

AUSTRALIA

Environmental Noise Health Report

A report on The Health Effects of Environmental Noise other than Hearing Loss was released in May and is available for download from http://enhealth.nphp.gov.au/council/pubs/pdf/noise.pdf. This report was developed for the enHealth Council by the New South Wales Health Department, with funding provided by the Australian Government Department of Health and Ageing. The primary aim of the report is to provide a review of the health effects and the measures which can be directed at environmental noise management. This 88 page document will be of interest to all those involved with any aspect of environmental noise.

Acoustic Inventions

The Australian ABC TV program, New Inventors, has featured at least two acoustic inventions. Chris Field was the successful winner of his heat for the Silenceair. Chris now goes into the finals for the program. During his Ph.D. on environmental noise, Chris discovered the effects of acoustic wavelengths on rocks in water, and applied his research to ventilation technology. Silenceair is a transparent ventilation system, about the size of two bricks. It allows more natural airflow through buildings than other ventilation devices, and reduces external noise entering a building, by diffusing sound. It is made from Lexan; a strong form of PVC which is used in place of glass. Silenceair sits in its own frame, and is integrated into walls. At the core of its design are 12 different sized tubes, called resonators, which reduce external noise.

Another invention was from David Telfer with an antibio device for controlling bacteria. According to the program, a low frequency variable sound irritates bacteria and viruses in water and controls them. He stated that it does not kill bacteria - just irritates them and it is used to purify water in swimming pools and for drinking.

You can find more about these and other inventions from www.abc.net.au/newinventors/inventions/

Virtual City Sounds

Melbourne is the capital of Victoria, Australia; a city with a population of over 3 million. The city of Melbourne has launched a visionary new computer program that creates a virtual Melbourne that people can "walk" around and listen to commonly experienced city sounds. The program – which uses the latest computer-game technology – allows people to discover what noises they do and do not enjoy before they take the more substantial step of moving into the city. It also doubles as a questionnaire to assess people's perception of different noises, soundproofing techniques and related subjects. The program will be available on the City of Melbourne's website www.melbourne.vic.gov.au.

JAPAN

Contracted research project in INCE/Japan

INCE/Japan has established research projects under contract with the Ministry of the Environment since 1999. Most of the time, projects were completed within three to five years. In this 2004 fiscal year, five projects are supposed to be continued or newly started. The subjects and the leaders are as follows:

- Reduction of Shinkansen railway noise (Dr. H. Tachibana)
- General survey technique for social response to traffic noise (Dr. S. Kuwano)
- Noise assessment and regulations (Dr. H. Tachibana)
- Measurement and evaluation of low frequency noise (Dr. S. Yamada)
- Assessment of environmental ground vibration (Dr. S. Kunimatsu)

These projects include important issues that will lead Japanese future noise policy. For example, common noise descriptors for traffic noise are discussed and investigated. Also work is in progress on the assessment of the combined noise sources. The last one in the list above is a new project, which will examine the difference of vibration level defined by between ISO 2631 and the present JIS standard. This is because national regulation is now specified based on the present Japanese Standard, while the international standard is different.

The leaders are required to organize technical committees, perform the project and write a report. The due date has been set for the end of 2005 February.

EUROPE

HYENA is an EU Project

A project called HYENA is underway within the European Union. The acronym is for **HY**pertension and **E**xposure to **N**oise near **A**irports. Few investigators have studied health effects associated with exposure to aircraft noise. The overall evidence suggests that a weak association exists between long-term noise exposure and high blood pressure or cardiovascular disease, but studies to date have shown contradictory results. There are some indications that the potential effects of noise on blood pressure may be mediated via stress hormones.

Previous studies have traditionally considered noise from a single specific source only, such as aircraft or road traffic. Aircraft noise might be more annoying than road traffic noise, but findings from previous studies are unclear. Subjective attitudes towards the noise and the activities disturbed may modify the effect of noise quite considerably. Several studies have shown excess risk of cardiovascular disease associated with air pollution. Airports act as hot spots for both air pollution and noise. Therefore, it may be important to consider exposure to ambient air pollution as a possible confounder/effect modifier of the association between community noise and high blood pressure/cardiovascular disease. The main source of noise, however, tends to derive from aircraft movements, while much of the air pollution is associated with road transport generated by the airports.

The overall project aim is to assess the impacts on cardiovascular health of noise generated by aircraft and road traffic. The project will evaluate the modifying effects of air pollution on noise associated cardiovascular effects, and will analyze the difference in blood pressure resulting from different noise exposure patterns. The role of annoyance and sleep disturbances due to noise, on blood pressure, will be assessed, and the impact of aircraft and road traffic noise on stress hormone levels will be investigated. Acute changes in blood pressure following short-term changes in noise levels will be assessed.

The specific objectives are to analyze the exposure-response relationships in adults between long-term exposure to airport related noise and high blood pressure.

- To evaluate the modifying effects of traffic related air pollution on noise associated cardiovascular risk factors and cardiovascular disease.
- To analyze the difference in blood pressure resulting from different noise exposure patterns.
- To assess the possible modifying effects by annoyance and sleep disturbances due to road and aircraft noise, on blood pressure.
- To analyze the impact of aircraft and road traffic noise on stress hormone levels.
- To analyze the effects of noise exposure on high blood pressure in susceptible subgroups of the population.
- To provide scientific basis and support for guidelines for a European policy on noise abatement.

The project includes cross-sectional studies near major airports in Germany (Berlin Tegel), Greece (Athens), Italy (Milano Malpensa), the Netherlands (Amsterdam Schiphol), Sweden (Stockholm Arlanda) and the UK (London Heathrow), including a total of 6,000 study subjects. The studies will use uniform methods for the assessment of noise exposure and health effects (blood pressure, ischaemic heart disease). Stress hormones will be determined in saliva and disturbance/annoyance will be investigated using questionnaires. Exposure to air pollution will be assessed at selected airports. Random effects models allowing for repeated measurements in selected individuals will be used to assess short-term changes in blood pressure following changes in noise levels. A pooled analysis and an overall evaluation of the results will be undertaken. The studies are conducted in the vicinity of airports with a wide range of exposures, from low to high levels of noise exposure from different

continued on page 117

HYENA is a project, not an animal

INCE/USA honors Eric Ungar

INCE/USA

Eric Ungar Receives the INCE/USA Distinguished Noise Control Engineer Award

Eric E. Ungar of Acentech, Inc. in Cambridge, Massachusetts was awarded the INCE Distinguished Noise Control Engineer award during ceremonies at NOISE-CON 04 in Baltimore, Maryland on 2004 July 13.

The INCE Distinguished Noise Control Engineer Award recognizes individuals who have rendered conspicuous and consistently outstanding service to the Institute and to the field of noise control engineering over a sustained period.

Eric Ungar, right, receives the Distinguished Noise Control Engineer Award from 2004 INCE/USA president Joseph Cuschieri.

His citation reads *World Class engineering scientist, consultant, teacher, and author with significant international contributions to acoustics, noise and vibration control, structural dynamics, and damping.*

He becomes the fifth member of the organization to receive the award under the program, which began in 1997. Previous awardees were Leo L. Beranek (1997), George C. Maling, Jr. (2001), William W. Lang (2002), and Robert J. Bernhard (2003). Dr. Ungar served as president of INCE/USA in 1985 and as a director in 1984-1987. The award consists of a certificate and an engraved silver bowl.

Donavan is named NNI Pan American Editor

Paul Donavan, past president of INCE/USA and International INCE vice president for Pan American affairs, has been named Pan American Editor of *NNI*. He will begin editing the material in the Pan American News Department with the December issue of this magazine, and his first Editor's View will appear in the 2005 March issue.

Paul Donavan received his Master and Doctorate of Science degrees in Mechanical Engineering and Acoustics from the Massachusetts Institute of Technology in 1976. He began his professional career in environmental noise working in the Washington D.C. area at Wyle Laboratories and then at the National Bureau of Standards. In 1979, he moved to Michigan to work at General Motors—initially doing tire/pavement noise research. In his 20 years at the GM Noise and Vibration Laboratory, Paul led vehicle noise control activities in the areas of tire, aerodynamic, and passby noise, and structure-borne noise analysis. Since 2001, he has been at the acoustical consulting firm of Illingworth & Rodkin, Inc., in Petaluma, California, where he continues his work in tire/pavement noise and more general environmental noise.

He has been a member of the Acoustical Society of America since 1973 and is currently a member of the Noise Technical Committee. Paul is also a member of the Noise and Vibration Committee of the Society of Automotive Engineers and chairs the SAE N&V Reviewers Committee.

Three student papers are awarded prizes at NOISE-CON 04

Three student papers were awarded prizes for outstanding papers presented at NOISE-CON 04. The award program, which began in 1989, honors

students from American universities who have done excellent research in some area of noise control engineering and who communicate the results through a paper at a NOISE-CON conference or an INTER-NOISE congress. The award consists of a 1000 USD check, a certificate, and complimentary registration at the meeting. The awardees, their paper titles, and university affiliations are given in the figure captions below.

Andrew R. Barnard, right, of Michigan Technological University, receives a student paper prize from INCE/USA President Joseph Cuschieri for the paper "Measurement of sound transmission using a modified four microphone impedance tube" by Andrew R. Banard and Mohan D. Rao.

Jason D. LaLonde, right, of Michigan Technological University, receives a student paper prize from INCE/USA President Joseph Cuschieri for his paper "Study and reduction of noise from an electric router" by Jason D. LaLonde, Ronald L. Pruse, and Mohan D. Rao.

Kiho Yum of Purdue University, receives a student paper prize from INCE/USA President Joseph Cuschieri for his paper "Sound radiation modes of a tire on a reflecting surface" by Kiho Yum and J. Stuart Bolton.

The INCE/USA student paper awards are funded by the INCE Foundation, a non-profit organization founded in 1993 and incorporated under Section 501 (c)(3) of the Internal Revenue Code. Gifts to the Foundation help to fund these awards, and are tax-deductible to the extent allowed by U.S. tax law.

European News *continued from page 115*

sources, which will allow for detailed analyses of exposure-response relationships for the general population as well as for susceptible subgroups.

More details can be found at the project website, www.hyena.eu.com.

UNITED KINGDOM

Stansted Expansion Being Reviewed

There is a group in the UK called Stop Stansted Expansion, which has been granted a judicial review of the UK Department of Transportation to enlarge several other airports. At issue is an Air Transport White Paper which contains the rule that expansion of airports must be commercially justifiable. The group believes that the document contains flaws and inconsistencies.

Student paper prizes are awarded at NOISE-CON 04

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+852 2 543 7442 • +852 2 541 4089
tonyleung@scienceintal.com

India: Mecord Systems and Services Pvt. Ltd.
+91-22-5008604, +91-22-5008128 • +91-22-5007560
mecord.systems@vsnl.com

Indonesia: PT Transindotama Sinar Perkasa
+62 21 4584 0670 • +62 21 4584 2942
transit@dnet.net.id

Ireland: Industrial Acoustics Limited
+353-1-2828034 • +353-1-2828427
industrial@eircom.net

Italy: S.C.S. Controlli e Sistemi S.r.l.
+39-049-920 09 75 • +39-049-920 12 39
gaita@scs-controlsys.com

Korea: Sunil Measuring System Co., Ltd.
+82 2 572 8481 • +82 2 572 7931
sunilms@sunilms.co.kr

Malaysia: O'Connor's Engineering Sdn. Bhd
+60 3 7953 8400 • +60 3 7957 7871
mawardis@oce.com.my

Netherlands, Belgium, Luxembourg: Goffin Meyvis Analytical & Medical Systems B.V.
+31-76-508 60 00 • +31-76-508 60 86
bstuart@goffinmeyvis.com

New Zealand: Machinery Monitoring Systems Ltd
+64 9 623 3147 • +64 9 623 3248
mms@bitz.co.nz

Portugal: M.R.A. Instrumentacao S.A.
+351-21-421 74 72 • +351-21-421 81 88
n.dias@mra.pt

Republic of South Africa: Environmental Instruments International cc
+27 21 910 3403 • +27 21 919 7783
env.inst@iafrica.com

R.O.C, Taiwan: Ring-In Trading Development Co., Ltd.
+886 2 2381 6767 • +886 2 2381 2423
ringin@ms6.hinet.net

Singapore: O'Connor's Singapore Pte Ltd
+65 6473 7944 • +65 6472 4508
tan.wheelee@oconnor.com.sg

Spain: ALAVA Ingenieros S.A.
+34-91-567 97 00 • +34-91-570 26 61
j.ruiz@alava-ing.es

Sweden: Saven Hitech AB
+46 8 505 641 32 • +46 8 733 04 15
mats.herbert@savenhitech.se

Switzerland: A -TECH&Consulting GmbH
+056 634 26 26 • +0566 345 345
a-tech@swissonline.ch

Thailand: Sithiporn Associates Co., Ltd.
+66 2 433 8331 • +66 2 433 1679
purchase@sithporn.co.th

United Kingdom: ANV Measurement Systems
+44-1908-64 28 46 • +44-1908-64 28 14
info@noise-and-vibration.co.uk

Scantek, Inc.

Mexico and South America: Ik' Atl, S.A. de C.V.
52 5547 4678 • 52 5547 4678
ikatl@hotmail.com

SoundPLAN LLC

Australia: Marshall Day Acoustics
+61 39416 1855 • +61 39416 1231
noelmorris@marshallday.com.au

Brazil: GROM Acustica & Automacao
+55 21 263 0792 • +55 21 263 9108
comercial@grom.com.br

Canada: Navcon Engineering Network
+1 714 441 3488 • +1 714 441 3487
Forschner@navcon.com

China: BSWA Technology Co., Ltd
+86 10 6200 6160 • +86 10 6200 6201
chenfeng@bswa.com.cn

Czech Republic: SYMOS s.r.o.
+42 2 57 22 56 77 (78) • +42 2 57 22 56 76 (79)
symos@symos.cz

Dennmark: Delta Acoustics & Vibration
+45 45 20 12 00 • +45 45 20 12 01
JKL@Delta.dk

Finland: Delta Acoustics & Vibration
+45 45 20 12 00 • +45 45 20 12 01
JKL@Delta.dk

France: Euphonia
+33 02 40 18 05 18 • +33 02 40 19 05 20
bsuner@euphonia.fr

Germany: Braunstein + Berndt GmbH
+49 7191 91 44 0 • +49 7191 91 44 24
bbgmbh@soundplan.de

Greece: Industrial Acoustics Hellas
+3010 6630 333 • +3010 6630 334
dpramas@hotmail.com

Hungary: VIBROCOMP GmbH
+36 1 275 2138 • +36 1 275 2138
Vibrocomp@matavnet.hu

India: Foretek Marketing Pvt. Ltd.
+91 80 526 6813 • +91 80 526 6813
info@foretekin.com

Italy: Spectra s.r.l.
+39 039 613321 • +39 039 6133235
spectra@spectra.it

Indoneisa: SHAMA Technologies (S) Pte Ltd
+65 6776 4006 • +65 6776 0592
shama@singnet.com.sg

Japan: Consulting Group Technical Center
+81 45 935 3818 • +81 45 935 3806
Watanan@onosokki.co.jp

Korea (South): ABC TRADING
+82 2 2226 3151 • +82 2 2226 7383
kslee@abctrd.com

Malaysia: SHAMA Technologies (S) Pte Ltd
+65 6776 4006 • +65 6776 0592
shama@singnet.com.sg

New Zealand: Marshall Day Associates
+64 9 379 7822 • +64 9 309 35 40
keith@Marshallday.co.nz

Norway: Delta Acoustics & Vibration
+45 45 20 12 00 • +45 45 20 12 01
JKL@Delta.dk

Poland: PC++ Software Studio S.C.
+48 602 228317 • +48 58 677 1847
koniarek@interecho.com

Portugal: AAC Centro de Acustica Aplicada SL
+349 45 298233 • +349 45 298261
alberto@aac.pt-alava.es

Singapore: SHAMA Technologies (S) Pte Ltd
+65 6776 4006 • +65 6776 0592
shama@singnet.com.sg

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+349 45 298233 • +349 45 298261
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Sweden: Sveriges Provnings-och Forskningsinstitut
+46 33 16 53 40 • +46 33 165 420
Andreas.Gustafson@sp.se

Taiwan: Purtek Engerprise Co Ltd
+886 2 2769 3863 • +886 2 2756 7582
purtek@ms13.hinet.net

United Kingdom: Technical Development & Investigation
+44 1206 762617 • +44 1206 762617
tdi.ltd@ntlworld.com

USA: Navcon Engineering Network
+1 714 441 3488 • +1 714 441 3487
Forschner@navcon.com

TEAC

Japan: +81 422 52 5016 • +81 422 52 1990

Germany: +49 611 7158417 • +49 611 7158392

Conference Calendar

Below is a list of congresses and conferences sponsored by International INCE and INCE/USA. A list of all known conferences related to noise can be found by going to the International INCE page on the Internet, www.i-ince.org.

2004 September 20-22

ACTIVE 2004

The 2004 International Symposium on Active Control of Sound and Vibration

Williamsburg, Virginia, USA. Contact: Richard J. Silcox, Mail Stop 463, NASA Langley Research Center, Hampton, VA 23681. Tel. +1 757 864 3590; Fax: +21 757 864 8823; e-mail: r.j. Silcox@larc.nasa.gov.

2005 August 06-10

INTER-NOISE 2005

The 2005 International Congress and Exposition on Noise Control Engineering

Rio De Janiero, Brazil. Contact: Prof. Samir N.Y. Gerges, Mechanical Engineering Department, Acoustics and Vibration Laboratory, University Campus - Trindade, Florianopolis, SC - CEP 88040-900, BRAZIL. Tel. +55 48 2344074; Fax: +55 48 2320826: e-mail: samir@emc.ufsc.br.

2005 October 17-19

NOISE-CON 2005

The 2005 National Conference and Exposition on Noise Control Engineering

Minneapolis, MN, USA. Contact: Institute of Noise Control Engineering, INCE/USA Business Office, 210 Marston, Iowa State University, Ames, IA 50011-2153. Tel. +1 515 294 6142; Fax: +1 515 294 3528; e-mail: IBO@inceusa.org. Internet: http://www.inceusa.org.

2006 December 03-06

INTER-NOISE 2006

The 2006 International Congress and Exposition on Noise Control Engineering

Honolulu, Hawaii, USA. Contact: Institute of Noise Control Engineering, INCE/USA Business Office, 210 Marston, Iowa State University, Ames, IA 50011-2153. Tel. +1 515 294 6142; Fax: +1 515 294 3528; e-mail: IBO@inceusa.org. Internet: http://www.inceusa.org.

2007

INTER-NOISE 2007

The 2007 International Congress and Exposition on Noise Control Engineering

This congress will be held in Europe. For further information on the dates and venue, please contact the I-INCE General Secretary, Robert J. Bernhard, Ray W. Herrick Laboratories, Purdue University, West Lafayette, IN 47907, USA. Tel. +1 765 494 2141; FAX: +1 765 494 0787; e-mail: bernhard@ecn.purdue.edu.

Product News

The following companies exhibited at NOISE-CON 04. Contact information and a brief description of the products offered is given. (Booth = Booth representatives at NOISE-CON 04.)

01dB, Inc.
31 Jordan Street
Skaneateles, NY 13152
www.01dbsupport.com
Phone: 315-685-3141 • Fax: 315-685-3194
E-mail: mike@techformeas.com
Booth: Michael Wahlrab, Vincent Rey
Orchestra, the new multichannel high performance data acquisition system for all 01dB software was on display. Our new SOLO sound level meter with real time USB interface and frequency analysis was also demonstrated. In addition, the NC 10 and Viper sound quality software as well as our traditional PC based acoustic and vibration measurement systems were shown.

ACO Pacific, Inc.
2604 Read Ave
Belmont, CA 94002
www.acopacific.com
Phone: 650-595-8588 • Fax: 650-595-8588
E-mail: acopac@acopacific.com
Booth: Noland Lewis, Ana Coo, Randy Gawtry
Celebrating 25 years, ACO Pacific, Inc. introduced the SLARM™ Community Sound Level Alarm and Monitor with ACOustAlert™ technology; SI7BNC ICP powered Sound Intensity Survey System; NEW – 7052PH Phantom Powered Measurement Mic System PSIEPE4 CCLD ICP converters for the PS9200 and Studio Phantom Systems; 7052SYS and MK224SYS microphone systems; the 4212 and 4048 ACOtron™ preamps; and the RA and RAS series of right angle preamps designed to meet specialized applications. A leading manufacturer and supplier of Type 1 and Type 1.5™ 1 inch, inch and inch measurement microphones, PS9200KIT (1/2 Inch) and PS9200KIT-1/4 (1/4 Inch) microphone "Kits", ACOustic Interface™, Simple Intensity™ sound and intensity systems, Very Random™ White/Pink/1kHz noise generators will also be displayed. ACOustics Begins With ACO™

American Acoustical Products
6 October Hill Rd
Holliston, MA, 01746
www.aapusa.com
Phone: 508-429-1165 • Fax: 508-429-8543
E-mail: info@aapusa.com
Booth representative: Tony Fischetti
American Acoustical Products, manufacturers of an innovative line of light weight, flame retardant acoustical composites, supported by state of the art diagnostic capabilities.

Architectural Polymers Inc.
RD#2 Box 191-a1
New Ringgold, PA, 17960 USA
Phone: 570-386-3111 • Fax: 570-386-3777
E-mail: poly1@entermail.net
Elastomeric formliner systems, elastomeric thin brick formliner systems, flexible molds, casting materials, form oils, architectural stains.

Asphalt Pavement Alliance
6113 Bickford Ct.
Gahanna, OH 43230
www.asphaltalliance.com
Phone: 614-855-1905 • Fax: 614-855-5384
E-mail: wjones@asphaltinstitute.org
Booth: Wayne Jones
Asphalt Pavement Alliance Booth – Fact: 94% of the 2.27 million miles of paved roads, streets, and highways in the United States are surfaced with asphalt. Exhibited was the latest information on Safe, Smooth, Quiet, and Durable Hot Mix Asphalt Pavements built using Superpave™ Technology.

Bayer Chemicals
100 Bayer Road
Pittsburgh, PA 15205-9741
www.Bayferrox.com
Phone: 412-777-3111 • Fax: 412-777-7626
E-mail: paul.croushore@bayerchemicals.com
Booth representative: Paul Croushore
Bayer produces Bayferrox iron oxide pigments that color concrete products. For reducing sound, colorful precast concrete sound barrier walls and concrete blocks are two ideal products. Pigmented concrete segmental retaining wall systems make better use of land along roadways. Why use gray concrete when your walls can be any earth tone color?

Braaksma Design
4444 Utica St.
Denver, CO 80212
Phone: 303-433-1175 • Fax: 303-433-1034
E-mail: carolyn@braaksmadesign.com
Booth: Carolyn Braaksma and Jeff Engelmann
Public Walls/ Braaksma Design Inc. showed cost-effective and site-sensitive wall enhancements for otherwise mundane projects. Custom design generated for your neighborhood or community.

Brüel & Kjær
2815 Colonnades Ct.
Norcross, GA 30071
www.bkhome.com
Phone: 800-332-2040, 770-209-6907 • Fax: 770-448-3246
E-mail: bkinfo@bksv.com
Booth: Rick Stillmaker, Gary Newton, Jr.
A world leader in sound and vibration, Brüel & Kjær

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Cambridge Collaborative, Inc.

Carsonite

Casella USA

Commonwealth Industries

CYRO

Data Physics Corp.

serves customers involved in all areas of sound and vibration testing-compliance, research, product development, and manufacturing. Offering solutions for multi-channel analysis, modal analysis, structural analysis, materials testing, sound quality, production test, quality control, noise source location, acoustic holography, and many more. products include analysis software, transducers for both vibration and acoustics, sound level meters, analyzers, shakers, and controllers. Brüel & Kjær also offers world-class services- calibration, educational seminars, and applications consultation.

Cambridge Collaborative, Inc.
689 Concord Avenue
Cambridge, MA 02138
cwww.seam.com
Phone: 617-876-5777 • Fax: 617-876-1816
E-mail: cmusser@ccinc.com
Booth: Jerry Manning, Chad Musser
Cambridge Collaborative's SEAM® software is a Statistical Energy Analysis modeling software, which allows prediction and analysis of the vibration and acoustic response of complex dynamic systems. Applications include automobile and aircraft interior noise; aerospace launch environment; and radiated noise in ships and submarines.

Carsonite
605 Bob Gifford Blvd.
Early Branch, SC 29916
www.carsonite.com
Phone: 803-943-9115 • Fax: 803-753-9081
E-mail: sales@carsonite.com
Booth: Bill Ward
Carsonite exhibited its Sound Barrier. This 2" X 6" tongue and groove plank is made of a reinforced fiberglass polymer that can be filled with recycled tire rubber upon request. Because of the modular, lightweight design, the Sound Barrier can be installed using a simple post and foundation design. Since it is lightweight, it is easily installed on structures with no additional reinforcement required.

Casella USA
17 Old Nashua Road, #15
Amherst, NH 03031
www.casellausa.com
Phone: 800 366-2966 • Fax: 603-672-8053
E-mail: info@casellausa.com
Booth: Bob Selwyn
Casella USA exhibited a range of CEL acoustic products including the brand new CEL-400 series of real time analyzers. Two models are available called the CEL-450 and 490 variants with real time octave and one third octave capability and an ultra wide 140 dB dynamic range. Also on show will be the all new CEL-110 series of acoustic calibrators complying with the latest international standards. The CEL-300 series convertible noise dosimeters and sound level meters, the CEL-500 series real time third octave analyzer and the CEL-900 series pc software based analysis programs for narrow band measurements and multifunction data logging were also shown.

Commonwealth Industries
500 W. Jefferson St
PNC Plaza 19th Fl
Louisville, KY 40059
Phone: 502-589-8100 • Fax: 502-589-8158
E-mail: richard.ferguson@ciionline.com
Introducing Sound Barrier System made of aluminum that is light weight and requires no heavy equipment to install, can be installed on bridges and overpasses without major redesigning, can be coated to create many types of aesthetics, designs and colors can change from side to side.

CYRO
100 Enterprise Dr.
Rockaway, NJ 07853
www.cyro.com
Phone: 800-631-5384 • Fax: 973-442-6117
E-mail: barratt@cyro.com
Booth: Steve Barratt, Eric Humphries
CYRO Industries has provided transparent noise barrier solutions for more than 25 years. PARAGLAS SOUNDSTOP® Noise Barrier systems are highly durable, retaining their transparent clarity and strength, without yellowing, through years of sunlight exposure. SOUNDSTOP® GS CC sheet is ideal for bridges due to its light weight and fragment retention feature which controls falling debris resulting from collision. SOUNDSTOP® Ready-Fit Panel System is a complete frame assembly. Adaptable to any post system, it eliminates engineering design costs and optimizes fabrication costs.

Data Physics Corp.
2025 Gateway Place, Suite 260
San Jose, CA 95110
Phone: 408-437-0100 • Fax: 408-437- 0509
E-mail: sales@dataphysics.com
Booth: Arun Menon, Pierre Wickramarachi, Terry Weed
Data Physics has been supplying high performance solutions in signal processing to the noise and vibration community for the past 20 years. The recently introduced scalable DSPcentric signal analysis engine, Abacus, provides a single platform uniquely suited for both realtime signal analysis and vibration control applications, from 8 to 1024 channels. Contact the company and discover why Abacus has already captured the imagination of users such as Boeing, EADS and NASA.

Dodge-Regupol Inc.

715 Fountain Ave.
Lancaster, PA 17601
www.regupol.com
Phone: 866-326-5712 • Fax: 717-295-3414
E-mail: pcd@regupol.com
Booth: Paul Downey, Greg Bachman, Kathleen Keller, Art Dodge

Featured was Regupol QT, the engineered product for reducing impact sound. QTscu (sound control underlayment) provides the largest improvement in resilient underlayments as measured by delta IIC. QTscu allows all hard surfaces to be directly fixed, including ceramic tile. QTrbm (resilient base mat) is a roll-out material for use under concrete pours in joisted structures. It's ease of installation and low dynamic stiffness guarantees superior field performance every time.

Durisol, Inc.

67 Frid St
Hamilton, ON, L8P 4M3 Canada
Phone: 905-521-0999 • Fax: 905-521-8658
E-mail: edwards@durisol.com
Booth: Michael K. Edwards, Doug Carter, Gene Lamberson

Durisol Inc., has been providing product solutions for environmental noise control for Over 50 Years. Our noise wall systems and exterior acoustic products service the commercial, industrial, transportation and rail markets. Durisol is the pioneer of absorptive highway noise barriers, with global representation and manufacturing facilities.

Eckel Industries Inc, Acoustic Division

155 Fawcett Street
Cambridge, MA, 02138
eckel@eckelacoustic.com
Phone: 617-491-3221 • Fax: 617-547-2171
E-mail: eckel@eckelacoustic.com
Booth: Alan Eckel, Jeff Morse, Jack Greenmum, Greg Goss

Acoustic Test Facilities, Anechoic Chambers, SuperSoft Free Field Chambers and Reverberation Rooms, Architectural Noise Control Panels and Modular Panels Enclosures.

Faddis Concrete Products

3515 Kings Highway
Downington, PA 19335
www.faddis.com
Phone: 201-888-1553 • Fax: 201-612-8831
E-mail: gary.figallo@faddis.com
Booth representative: Gary S. Figallo

Faddis Concrete Products exhibited a variety of noise barriers including AcoustaCrete sound absorptive concrete noise barriers and AcoustaX perforated metal noise barriers.

G.R.A.S. Sound and Vibration

23203 Lorain Rd. #9
North Olmsted, OH 44070
www.gras.us
Phone: 440-779-0100 • Fax: 440-779-4148
E-mail: sales@gras.us
Booth: Peter Wulf-Andersen, Ed Terrell

The instrumentation includes a broad range of standard measurement microphones and preamplifiers and a wide range of more specialized transducers and accessories for more specific applications: Sound intensity microphones, outdoor monitoring microphones, artificial ears, ear & mouth simulators, CCP constant current low noise preamplifiers and electret microphones, calibrators etc. The microphone-preamplifier combinations feature built in TEDS. 1" and 1/2" microphone systems for measurement of very low noise levels below the threshold of hearing as well as multiple microphone arrays. Standard Laboratory microphones LS1P and LS2P are also available.

Hoover Treated Wood

154 Wire Road
Thompson, GA 30824
Phone: 800-531-5558 • Fax: 703-595-8462
E-mail: dyoung@frtw.com; thixon@frtw.com

PLYWALL offers a complete line of wood engineered noise barrier systems. Our systems are sold ready to install, and are shipped directly to the work site. For a cost effective, quality alternative to steel or concrete noise barriers, PLYWALL is the "Sound Solution."

Industrial Acoustics Company

1160 Commerce Ave.
Bronx, NY 10462
www.industrialacoustics.com
Phone: 718-430-4591 • Fax: 718-430-4591
E-mail: kdelasho@industrialacoustics.com
Booth: Bob Righi, Paul Enderle, Mike Bowen, Bob Schmidt

Industrial Acoustics Company's exhibit featured our Metadyne patented perforated metal Anechoic Chamber systems, reverberation rooms, and other test rooms used in the transportation industry. We also exhibited our metal absorptive sound barrier panels for the transportation industry.

International Cellulose Corporation

12315 Robin Blvd.
Houston, TX 77045
www.spray-on.com
Phone: 713-433-6701, 800-444-1252 • Fax: 713-433-2029
E-mail: icc@spray-on.com
Booth: J.M. "Chuck" Smith, Dave Jarret

International Cellulose Corporation (ICC) is the developer and manufacturer of spray-on acoustical and thermal insulation treatment systems that are ideally suited for a broad range of commercial,

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Kimberly-Clark

Kinetics Noise Control

LMS North America

m+p international inc.

Maxxon Corp.

Navcon Engineering Network

industrial and residential applications, in both new construction and renovation projects. The ICC family of products provides the most flexible solutions available in meeting thermal, acoustical, lighting and aesthetic requirements. ICC products can also be applied to virtually any properly prepared surface configuration of wood, steel, concrete, glass or other common construction surfaces. International Cellulose Corporation is ISO 9001:2000 certified.

Kimberly-Clark
1400 Holcomb Bridge Rd.
Roswell, GA, 30076
www.kcnonwovens.com/quietech_home.html
Phone: 770-587-8000 • Fax: 770-587-7241
E-mail: acoustic_materials@kcc.com
Booth representative: Mike Gross
Kimberly-Clark featured QUIETECH™ Acoustic Materials, a line of highloft materials and facings that provide excellent noise attenuation in applications ranging from building products to automotive and industrial applications. Available in a variety of thicknesses and air flow resistances, QUIETECH™ Acoustic Materials are made from Kimberly-Clark's unique gradient density fiber structures and microfiber material layers, laminated to maximize sound absorption. Although lightweight, the materials offer high noise reduction coefficient ratings, thanks in part to the materials' fine fibers, which create countless microscopic air spaces for effective sound absorption. QUIETECH™ Acoustic Materials also provide thermal insulation properties as well as moisture resistance, repelling water while allowing vapor to escape. This means the materials do not support mold and mildew growth.

Kinetics Noise Control
6300 Irelan Place
P.O. Box 655
Dublin, Ohio 43017-0655.
www.kineticsnoise.com
Phone: 614-889-0480 • Fax: 614-889-0540
E-mail: archsales@kineticsnoise.com
Booth: Steve Manos, Richard Anthony, Bob Bost, Ginny Bost
Kinetics Noise Control, Inc. displayed products manufactured at our USA and Canadian facilities including Architectural Isolation products (floating floor systems, partition/ceiling isolation mounts, lagging/curtain products, and building isolation pads), Interiors products (absorptive panels, Ovation reflective panels, and diffusers), and Vibron products (commercial and industrial silencers, barrier walls, and curtain systems).

LMS North America
1050 Wilshire Drive Suite 250
Troy, MI 48084
www.lmsintl.com
Phone: 248-952-5664 • Fax: 248-952-1610
E-mail: info@lmsna.com
Booth: Lynn Martin, Gil Morris
LMS exhibited the virtual prototyping breakthrough, LMS Virtual.Lab Acoustics, including NEW Pre and Post processors; LMS SYSNOISE; and the latest Testing Acoustic products.

m+p international inc.
271 Grove Avenue , Bldg G
Verona, NJ 07044
www.mpihome.com
Phone: 973-239-3005 • Fax: 973-239-2858
E-mail: sales@mpina.com
Booth: Al Prosuk, Jim Churchill, Chris Wilcox
m+p international is a worldwide provider of systems and software for noise & vibration measurement and analysis, emission testing and process monitoring. From production to research, 1 channel to 192 channels, control, acquisition or analysis, Windows NT/2000/XP or Unix, m+p's complete line of vibration control, data acquisition and analysis system including the new Smart Office Acoustic Acquisition and Analysis Wizard.

Maxxon Corp.
920 Hamel Rd.
P.O. Box 253
Hamel, MN 55340
www.MaxxonCorporation.com
Phone: 800-356-7887 • Fax: 763-478-2431
E-mail: info@maxxon.com
Booth: Pat Giles, Brian Wanzer
Maxxon featured Acousti-Mat Superior Sound Control Systems – Proven in over 25 million square feet. Put an end to those "noise" complaints – even with open beam, concrete slabs and conventional wood frame systems. Increases IIC and STC up to 17 rating points over wood frame! UL listed. Also featuring Enkasonic, the only mat tested after 10 years of use — all available from Maxxon, the floor specialists.

Navcon Engineering Network
701 West Las Palmas Dr.
Fullerton, CA 92835
www.navcon.com
Phone: 714-441-3488 • Fax: 714-441-3487
E-mail: sales@navcon.com
Booth: Jim Steedman, Hans Forschner
Navcon Engineering Network exhibited Commercial Software Applications (SoundPLAN, INSUL, AIMAP), Technical Seminars (Acoustic Intensity, Environmental Noise & Modal Testing) , and

Engineering Consultation (Noise & Vibration Measurement, Analysis & Control). SoundPLAN is a three dimensional acoustic ray tracing software for exterior and interior noise propagation prediction. The software is an acoustical planning & noise control optimization tool with a wide range of applications (Urban Planning, Environmental Assessment, Noise Analysis, Noise Control Optimization, Field Noise Mapping, OSHA / MSHA,....). INSUL is used for predicting the sound insulation of walls, floors, ceilings and windows. The software was developed based on simple theoretical models that only require easily obtainable construction information. AIMAP is a MATLAB based program used for the assessment and display of acoustic intensity and sound pressure data.

OROS - Noise & Vibration Solutions
502 Shaw Road, B - 101
Dulles, VA 20166-9435
www.OROSInc.com
Phone: 888-200-OROS (6767) • Fax: 703-478-3205
E-mail: info@OROSInc.com
Booth: Jamal Dajani, John Woods, Mike Sweeney, Remy de Framond
New from OROS was the OR3x suite of analyzers and NV solutions range comprising sound quality, sound power and acoustic intensity. Ideal for in-field or lab use, OR3x systems are used daily by companies for noise analyses. From 2 to 64 channels, OROS systems are fast to analyze, easy to learn and a cinch to customize.

Overly Door Company
PO Box 70
Greensburg, PA 15601-0070 USA
www.overly.com
Phone: 800-979-7300 • Fax: 724-830-2871
E-mail: overly@overly.com
Booth: Bill Hugus, Wayne Burns
Overly Door Company exhibited its product line of sound retardant metal doors, wood doors and fixed window systems.

PCB/Larson Davis
(PCB)
3425 Walden Ave.
Depew, NY 14043
www.pcb.com

(Larson Davis)
1681 West 820 North
Provo, UT 84601
www.larsondavis.com
Phone: 716-684-0001 • Fax: 716-684-0987
E-mail: amohn@pcb.com
Booth representative: Mark Valentino
PCB and Larson Davis were teamed to present a variety of microphones, accelerometers, sound level meters, analyzers, and other acoustic test systems. In addition, Larson Davis showcased the Pimento, a compact and rugged multi-channel data acquisition system with advanced, integrated application software allowing custom solutions in just five minutes! Also on display was the new DSS, a multi-channel, multi-drop high-speed data acquisition system using revolutionary DSIT technology.

Porvair
700 Shephard Street
Hendersonville, NC 28792
Phone: 828-696-9854 • Fax: 828-697-7960
Jim Tettambel
800-843-6105 Ext 3344
E-mail: jtettambel@pamus.com
Booth: Don Floyd, Jim Tettambel
Porvair showed its high performance reticulated, open celled Metal Foam for the noise control and vibration market. The material has multi-functional capabilities for noise control, heat transfer, catalysis, combustion, fluid treatment, and others. Porosities of 5-130 pores per linear inch and densities of 5 –40% are controlled independently of one another, to optimize the Metal Foam to specific performance requirements. Porvair Metal Foam is available in Stainless Steel, Nickel, Copper, Titanium, Brass, Inconel, and Hastelloy.

Pyrok, Inc.
36 Butler Hill Rd
Somers, NJ 10589
Phone: 914-277-5135 • Fax: 914-276-3990
E-mail: info@pyrokinc.com
Pyrok Acoustical Plasters are widely utilized by transit designers for easy clean-ability, design flexibility, durability and sound absorption. Acoustement 40 is available in custom colors or it can be painted. The portland cement based Acoustement 40 can be utilized for exterior or interior applications. Acoustement 40 can be water washed with detergent to maintain a clean environment. Acoustement 40 provides a decorative, durable and acoustical surface for walls, ceilings and soffits. Its performance, superior adhesion and high compressive strength make Acoustement 40 an ideal material for such locations where a grid ceiling is not feasible, such as in abusive areas or in areas with low ceiling corridors, vaulted or curved ceilings. Pyrok Acoustical Plasters may be applied directly to a metal or concrete substrates. Acoustement 40, has excellent weather-ability against moisture buildup, humidity, temperature, freeze and thaw.

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Scantek will demonstrate the newest Norsonic wireless building acoustics system, an advanced community noise analyzer, new RION sound level meters, the new NC-meter from CESVA, and the latest noise prediction software, CadnaA, from DataKustik

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www.scottsystem.com
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Create beautiful textures in your next commercial wall project! Scott System's Flex Liners™ for architectural concrete are ideal for highway sound and retaining walls and are available in infinite standard and custom patterns. Or, specify integrally cast brick with Brick Snaps(r) or Scott's Brick Gasket Liner(tm) for traditional brick facades. Brick-embedded concrete is fast, economical and beautiful.

Sound Fighter Systems, L.L.C.
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Shreveport, LA 71106
www.soundfighter.com
Phone: 318-861-6640 • Fax: 318-865-7373
E-mail: pharrison@soundfighter.com
Booth: Patrick W. Harrison, Rand H. Falbaum, Cindy McLaughlin, Thadd Kuehnl
Sound Fighter displayed our Sound Fighter LSE Noise Barrier Wall System. It is an absorptive sound wall that is light-weight and easy to install. It is commonly used on highways, interstates, and around industrial equipment.

Sound Zero
680 Ben Franklin Highway
Birdsboro, PA 19460
Phone: 610-385-6797 • Fax: 610-385-7524
E-mail: mark.murphy@soundzero.com
Sound Zero exhibited light weight noise barrier systems and architectural facings products.

Soundown Corporation
17 Lime Street, Suite 1
Marblehead, MA 01945
www.soundown.com
Phone: 920-683-9998 • Fax: 920-683-9994
E-mail: dhuckins@soundown.com
Booth: Chris Murray, Joe Smullin, Thomas Dorfner, Dennis Huckins
Soundown is an innovative market leader, providing noise and vibration solutions. The company is a diverse manufacturer of composite acoustic materials for acoustical absorption, barrier, damping, and isolation. Unique products featured include the Sylomer isolation line. This line has been recognized world-wide for its outstanding performance and versatility, and is now available in North America.

SoundSorb & Concrete Solutions, Inc.
3300 Bee Caves Road, Suite 650
Austin, TX 78746
www.soundsorb.com, www.lbfoster.com
Phone: 512-327-8481 • Fax: 512-327-5111
E-mail: csi@soundsorb.com
Booth: Boone Bucher, Michael Turner, Nick Santucci
We displayed our acoustic product, SoundSorb®. Concrete Solutions, Inc. (CSI) licenses manufacturers, world-wide, to produce CSI's patented, non-structural cementitious product called, SoundSorb, which is used as an integral sound absorbing material for all structures where the need to eliminate the reflection of sound is desired. Typically, our product is used on sound walls along major highway and railway thoroughfares. It is the world's most widely used exterior cementitious acoustic material with the dual capability of achieving high acoustic values (NRC ratings of 0.95 or higher) along with the ability to replicate virtually any architectural design or pattern.

TEAC America
7733 Telegraph Road
Montebello, CA 90640
www.teac-recorders.com
Phone: 978-468-4135 • Fax: 978-468-4171
E-mail: sastulfi@teac.com
Booth: Steve Astulfi, Greg Wanchick, Dave Husted, Tom Yamaguchi
TEAC exhibited the new LX Series solid-state Data Recorders, featuring removable Flash-Memory Card recording media, DC/IEPE input amplifiers, LAN or FireWire interface, and up to 32-channel

configuration. Also exhibited will be the GX-1 Data Recording System, with AIT recording media, 200kHz ADC per channel, plug-in signal conditioning amplifiers, and up to 64-channel configuration. LX and GX data-file converters and device drivers to many popular analysis software applications are available.

Technicon Industries

4412 Republic Court
Concord, NC 28037
www.tcnind.com
Phone: 704-788-1131 • Fax: 704-788-7772
E-mail: info@tcnind.com
Booth: John Gagliardi, James Shaffer

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ViAcoustics

2512 Star Grass Circle
Austin, TX 78745
www.viacoustics.com
Phone: 512-444-1961 ext 257 • Fax: 603-994-4613
E-mail: JeffS@prodigy.net
Booth: Jeff G. Schmitt, David Nelson, Steve Dutton, Bill McKenna

ViAcoustics exhibited products and services for acoustic measurement, noise control and product sound quality analysis. ViAcoustics products include Acoustic Test Chambers (anechoic, hemi-anechoic and reverberant) from Acoustic Systems, Data Acquisition Systems from National Instruments and LabView based software applications/toolkits for acoustic measurement and sound quality analysis from Nelson Acoustical Engineering. ViAcoustics provides fully integrated systems for turnkey solutions to acoustic measurement applications. New products from ViAcoustics include the Small Device Noise Emission Test System and the Handheld Binaural Recording system.

Vibro-Acoustics

727 Tapscott Rd.
Scarborough ON Canada M1X 1A2
www.vibro-acoustics.com
Phone: 800-565-8401 • Fax: 888-811-2264
E-mail: tcharlton@vibro-acoustics.com
Booth: Karl Peterman

Vibro-Acoustics is the world leader in supplying the widest range of silencers for fans and air handling systems. From comprehensive product design, laboratory testing and integrated manufacturing, to product specification, selection and application. Vibro-Acoustics delivers over 40 years of industry experience. Vibro-Acoustics has developed innovative yet practical product solutions for some of the most diverse and dynamic projects in the world.

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Information on listings in the Directory of Noise Control Services is available from the INCE/USA Business Office, 210 Marston, Iowa State University, Ames, IA 50011-2153; +1 515 294 6142; Fax: +1 515 294 3528; IBO@inceusa.org. The price is USD 400 for 4 insertions.

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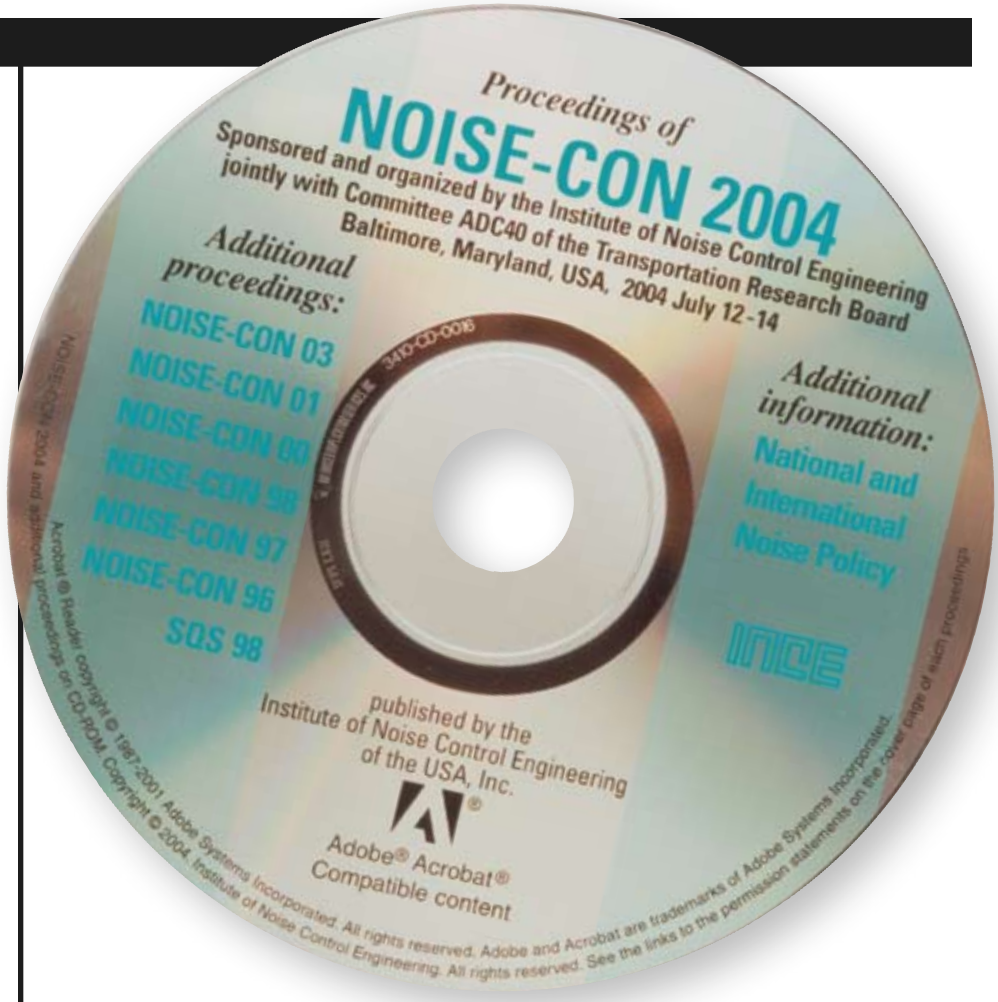

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