NOISE/NEWS INTERNATIONAL

Volume 19, Number 4
2011 December

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

- **A new method for predicting the annoyance of transportation noise**
- **INTER-NOISE 2011 Report**
- **INTER-NOISE 2012 Travel Planning**
- **MEMBER SOCIETY PROFILE The Czech Acoustical Society**

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New York City's Central Park. Courtesy of the Marriott Marquis Hotel and the INTER-NOISE 2012 Congress organizers.

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NOISE/NEWS INTERNATIONAL

This PDF version of Noise/News International and its Internet supplement are published jointly by the International Institute of Noise Control Engineering (I-INCE) and the Institute of Noise Control Engineering of the USA (INCE/USA). This is the second volume that is being published in PDF format only. The PDF format means that the issues can be read by freely available software such as that published by Adobe and others. It reduces publication time, saves printing costs, and allows links to be inserted in the document for direct access to references and other material. Individuals can sign up for a free subscription to NNI by going to the web site http://www.noisenewsinternational.net

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 and its Internet Supplement

www.noisenewsinternational.net

The primary change in this PDF-only volume of *NNI* is the ability to have "hot links" to references, articles, abstracts, advertisers, and other sources of additional information. In some cases, the full URL will be given in the text. In other cases, a light blue highlight of the text will indicate the presence of a link. At the end of each feature or department, a light blue back to toc will take the reader back to the table of contents of the issue.

- The Internet supplement contains additional information that will be of interest to readers of *NNI*. This includes:
- The current issue of *NNI* available for free download
- *NNI* archives in PDF format beginning in 1993
- A searchable PDF of annual index pages
- A PDF of the current *NNI* conference calendar and a link to conference calendars for worldwide meetings
- Links to I-INCE technical activities and I-INCE Technical Reports

Reflecting on the INCE 40th Anniversary

The first INTER-NOISE Congress was held in 1972 in Washington, USA. Thus, 2011 marks the 40th anniversary of the Congress series. The 40th International Congress and Exposition on Noise Control Engineering (INTER-NOISE 2011) was held in Osaka, Japan from 2011 September 4-7. The anniversary was marked by a ceremonial opening of a barrel of Sake by H. Tachibana, W. Lang, G. Daigle, R. Bernhard, and I. Yamada as an opening attraction "Kagami-wari" and was followed by a toast to the 40th anniversary.

The Congress in Osaka was the third INTER-NOISE to be held in Japan. Previous Congresses were held in Sendai in 1975 and Yokohama in 1994. The INTER-NOISE 2011 Congress was jointly organized by the Institute of Noise Control Engineering of Japan (INCE/Japan) and the Acoustical Society of Japan (ASJ). The theme of the Congress Sound Environment as a Global Issue was addressed by plenary and keynote lectures as well as dedicated structured sessions. Despite the challenges resulting from natural disasters earlier in the year, the organizers pushed on and persevered. In the end, and despite a typhoon that disrupted air travel in the days prior to the event, the Congress attracted close to 1000 attendees. On behalf of I-INCE, I would like to take this opportunity to offer my sincere thanks to the Congress President, Prof. Ichiro Yamada, as well as the entire Organizing Committee.

During the Osaka Congress, I-INCE held a second workshop for Young Professionals. The workshop was organized by Prof. R. Singh, I-INCE Vice President for technical activities. During the workshop, twelve Young Scientist Conference Attendance Grants were awarded to the recipients listed in the table below. Each award consists of 500 Euros and a signed certificate. Since in the majority of cases, the country of origin and the country of work/study is not the same, the certificate recognized both countries. Congratulations to all twelve recipients. In order to meet the increasing demands for these Travel Grants, the I-INCE Board has approved funds for a total of 18 Grants to be awarded during INTER-NOISE 2012 in New York next year. Details will be available on the website in due course. back to toc

Gilles Daigle
President,
International INCE

Left to right: Hideki Tachibana, William Lang, Gilles Daigle, Robert Bernhard, and Ichiro Yamada.

Volunteers and Getting Involved

Paul R. Donavan

Pan-American News Editor

At the NOISE-CON 2011 last July, a handful of volunteers took on the task of organizing a celebration of the founding of INCE/USA and honoring the founders and pioneers of the organization. There was an incredibly large turnout of founders and those involved in the initial development of INCE, both INCE/USA and International INCE. It was a poignant reunion as many of these founding and pioneering members had not seen each other for some time. Given the 40 years, it was amazing to note that some of these individuals are still or until recently have been volunteering their time and serving our organization and noise control in general. It is probably not good to single out individuals for fear of leaving some out, but if you take a look at the Fellows page on the INCE/USA website or look at the booklet "INCE: An Early History," you can figure out who these people are. For some of these extraordinary people, it is hard to conceive of many hours, days, months, and even years of their time and effort have into the Institute.

Both INCE/USA and I-INCE exist through the efforts of many volunteers. For INCE/USA, the only paid positions are at the INCE Business Office which does the day-to-day operations of interacting with INCE members, officers and directors, as well as providing support of conferences, among other things. Beyond this, the organization is managed and operated by uncompensated people who volunteer their talent and time serving as officers, directors, committee chairs, and conference organizers. Among these jobs are some very special positions that require substantial amounts of time including the Executive Director, the editor of NCEJ, and the editor of NNI. The organization is very fortunate indeed to have people that have stepped up to do this work. For the 25 or so officers, directors, and standing committee chairs, they attend two 1½ day face-to-face weekend meetings per year with one usually coinciding with a NOISE-CON or INTER-NOISE. Between the meetings, there is even more time spent on work needed for the organization to function as we know it. Our conferences would not succeed without those who donate considerable amounts of time organizing and chairing the events and those who organize and construct the technical program along session organizers.

For I-INCE, there are technical reports to produce, but the business meetings occur only at the INTER-NOISE Congresses, the slower pace is balanced by longer years of commitment. The position of President of I-INCE is a ten year commitment, two as President-Elect, four as President, and then four more as Past President. It is not much better for chairs of the INTER-NOISE congresses. They spend 3 to 4 years organizing the congress followed by six years serving on the I-INCE Board of Directors. In addition, there are officers who volunteer their service to the organization for a minimum of three years and often serve more. One of the more intense duties is that Secretary-General which, like the Executive Director of INCE/USA position, requires substantial amounts of time throughout the year.

If the above has not been overwhelming, for anyone interested in getting involved more fully with INCE, here are a couple of suggestions. The first is to participate in the conferences: attend them, prepare papers and presentations, and organize sessions in topics of interest to you. At each NOISE-CON and INTER-NOISE, there are open, next conference planning meetings. These give you a chance to meet some of the organizers and officers and to suggest ideas for sessions at the next conference. Follow this up actually organizing a session and volunteering your effort. For INCE/USA, if you have any interest in serving the organization in any capacity, make that interest known to any of the current officers and directors with even something as simple as e-mail if not a face-to-face meeting.

In closing, I personally thank all those who given of time and talent to make these organizations work. I am truly amazed by the efforts I see by some. I would encourage any of you readers to acknowledge and thank anyone you know or meet who contributes to these organizations. Although I said I would not single out individuals, I must especially thank George Maling and Bill Lang for all of their years of service, vision, commitment, and inspiration and for their continuing efforts at elevating the field of noise control engineering.

The Czech Acoustical Society

The Czech Acoustical Society originated in 1958 as the Acoustic Group of the Czechoslovak Scientific and Technical Association (AG/CSTA) under the direction of Prof. J.B. Slavik, and later of Prof. J. Nemec. Even though under the domination of communist ideology, the Society remained steadfast in its beliefs, evident by its slogan "Acoustic waves are propagated independently of political ideology."

In addition to the AG/CSTA, an Acoustical Commission was subsequently created as part of the the Czechoslovak Academy of Science under the direction of Prof. F. Kolmer, who will celebrate his 90th birthday this May. Although the communist government was suppressing all independently organized activities, AG/CSTA, in co-operation with the Acoustical Commission, started acoustical seminars in order to create a platform for the exchange of scientific and engineering information. This important move ensured continuation of scientific contacts with the western world, amidst an atmosphere of censorship and repression of scientific knowledge.

Two members of AG/CSTA, J. Ransdorf and P. Urban, have organized these seminars since 1964. The seminar participants consisted of scientists working in research, technical, and medical organizations. Since informal public gatherings were generally forbidden under the communist system, consequently the acoustical seminars had to be officially organized as AG/CSTA training seminars to share new information and upgrade the participants' acoustical proficiency.

The seminars became very popular because of the plethora of research and progress reported by members of these domestic acoustical conferences. A few members who were receiving literature from the western acoustical societies presented lectures on the latest developments.

The Council of the Czechoslovak Acoustical Society (CZSA), continuing in the tradition of former AG/ CSTA activities, was formed after the Prague "Velvet Revolution" in 1989 under the chairmanship of P. Urban. Subsequently, its heads have been Prof. Z. Skvor, J. Novak, V. Kunzl and currently Prof. O. Jiricek.

The seminars were converted into regular acoustical conferences, with experts invited from many European and other world societies. With the introduction of open conferences, the result has been a substantial increase in the number of participants. The conferences became the equivalent to the national conferences of other European societies, now directed by the successor organization, the Czech Acoustical Society (earlier AG/CSTA). To date, the total number of acoustical seminars organized since 1963 is 83.

Since 1994, the Czech Acoustical Society has published the journal "Akustické listy," ISSN 1212-4702, which provides information about progress in all branches of acoustics in the form of scientific papers and also basic information for society members.

Since 1989, many members of the Czech Acoustical Society have been active participants in national legislation, international government organizations, in the International Organization for Standardization (ISO), the International Electrotechnical Commission (IEC), and the United Nations Economic Commission for Europe, among other organizations. Others are active in foreign countries: Prof. J. Tichy was president of INCE/USA and the Acoustical Society of America (ASA) and Prof. I. Nabelek was active at the University of Tennessee. Members of the Society hold important roles in foreign scientific societies, at universities, government agencies, and private enterprises.

Due to the vigorous activities of the Czech Acoustical Society, International INCE assigned it the privilege to organize INTER-NOISE 2004 in Prague, which was assessed as successful. On June 10-13, 2012, the Czech Acoustical Society will host Euronoise 2012, on behalf of the European Acoustics Association. We look forward to seeing you in Prague again.

This is the 78th in a series of articles on the Member Societies of International INCE. This is an update of the profile that appeared in the 2001 September issue of this magazine.—Ed.

Member Society Profile is a regular feature of *Noise News International*. If you would like to have your society featured, please contact George Maling at inceusa@aol.com.

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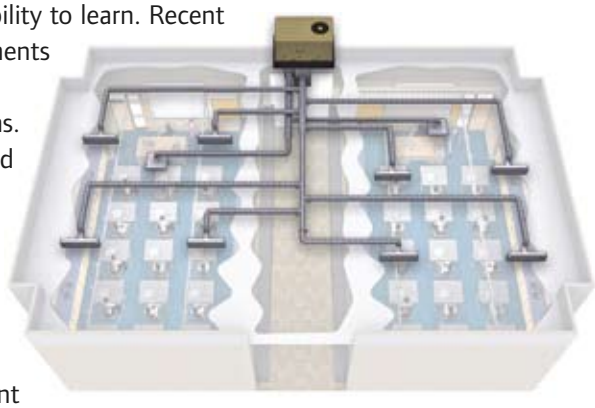

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INTER-NOISE 2011 Report

INTER-NOISE 2011, the 40th International Congress and Exposition on Noise Control Engineering, was held in Osaka, Japan From 2011 September 4 through September 7. The Congress was sponsored by the International Institute of Noise Control Engineering (I-INCE) and co-organized by the Institute of Noise Control Engineering of Japan (INCE/J) and the Acoustical Society of Japan (ASJ). The Congress was held at the Osaka International Convention Center (Grand Cube Oska). Grand Cube Osaka is located close to the city centre of Osaka, which is the second largest city in Japan and is the center of commerce, culture, food, etc in the Kansai Area with many historical sites such as Osaka Castle.

The opening ceremony on September 4 featured an opening musical event, several speeches, and second musical event.

GAGAKU at the beginning of the opening ceremony. GAGAKU is Japanese traditional music and dance from the 10th century. It used to be performed mainly at Imperial Court, in aristocratic society, and at important shrines and temples. The music and dance are portraying victorious battles.

Kohei Yamamoto, secretary general of INTER-NOISE 2011, was appointed to chair the opening ceremony. At first, he explained the historical background and the meaning of GAGAKU shown to the participants at the opening ceremony. He said GAGAKU was descended from ancient China and modified on the basis of Japanese native songs, dances, and musical instruments. The GAGAKU titled Ran-Ryo-O was performed at the time of a victory of battle in ancient times. Ran-Ryo-O in this first ceremony means the prayer for the victory and the success in noise control engineering. After this explanation, he introduced five opening address speakers to the participants.

Ichio Yamada, congress president of INTER-NOISE 2011 and president of INCE/Japan, said he is glad that this international congress is able to be held in spite of suffering the tragic earthquake, tsunami and nuclear power plant disaster that Japan experienced six months before the INTER-NOISE 2011. He also expressed his gratitude to people and nations for their help and encouragement. Following this, he explained the theme of the congress is "Sound Environment as a Global Issue," which is the global requirement nowadays. Finally, he encouraged all participants to communicate and discuss the latest progress in noise control engineering in this conference.

Masayuki Kusumoto, a representative of Osaka prefectural government, read the welcome message from the governor of Osaka prefecture. The message included the governor's welcome voice and gratitude of having selected Osaka as the host city. He said Osaka is the third largest city in Japan and known as the commercial capital with historical sites such as Osaka Castle. He hoped all the participants enjoy Osaka's special gourmet food, attractions and scenes that will guarantee their memorable trip.

Masato Akagi, president of Acoustical Society of Japan (ASJ), said thanks to overseas participants for coming to Japan in this bad flight condition due to typhoon approaching. Since ASJ is celebrating 75th anniversary this year, INTER-NOISE 2011 is one of the major events for ASJ. As one of the host organization, he said he is hoping the international conference will go well and be successful.

Hideki Tachibana, past president of INCE/Japan and ASJ, welcomed participants from all parts of the world. He said Japan was invited to host INTER-NOISE Congress three times in the past. The first in 1975, Sendai, the second in 1974, Yokohama and the third in 2011, Osaka. This is the 40th INTER-NOISE Congress that was selected in 2008 in Shanghai, China. Since 2008, the organizing committee encountered various crises such as an unexpected change of exchange rate which affected management of the budget, and the big disaster due to East Japan earthquake, Tsunami and succeeding nuclear accident in Fukushima. However, the organizing committee overcame these negative factors and finally this international congress is being held in accordance with the initial planning. He said he is hoping INTER-NOISE 2011 will be fruitful to all engineers and researchers from all countries in the world.

Gilles Daigle, president of International Institute of Noise Control Engineering (I-INCE), expressed his appreciation to all participants for joining INTER-NOISE 2011 Osaka and to the organizing committee for their efforts to organize this international conference. He said this is the 40th INTER-NOISE congress that was initiated in 1972 in Washington DC, where the worldwide engineers and researchers communicate the latest theoretical and experimental advancements in noise and vibration control. He explained INTER-NOISE 2011 is sponsored by I-INCE and co-sponsored by INCE/Japan and ASJ. As the president of I-INCE, he delivered the declaration of opening of INTER-NOISE 2011.

ETENRAKU at the end of the opening ceremony. It is traditional court music played with Japanese ancient musical instruments. The musical instruments are the winds called "Ryuteki," "Komabue," Hichiriki" and "Sho."

The opening plenary lecture titled Sound environment as a Global Issue—perspectives on global noise policies was presented by William W. Lang and Tor Kihlman. They spoke on the progress in noise control engineering made through the INTER-NOISE Congresses and publication of papers in Noise Control Engineering Journal. They also spoke of the activities of the International Council of Academies of Engineering and Technological Societies (CAETS) designed to influence global noise policy. (A list of CAETS activities can be found at http://www.caets.org/cms/7123/9996.aspx.—Ed.) abstract A welcome reception for all delegates followed the Sunday session.

Congress activities resumed on Monday morning with two distinguished keynote lectures in parallel sessions. Hisashi Sano, chief engineer/senior chief advisor at Honda R&D Americas, Inc. spoke on the introduction of active noise and vibration control in automobiles. His paper was titled Modern advancements in passive and active noise and vibration control technology in automobiles. abstract Stephen A. Stansfeld, professor, Psychiatry at Barts and the London School of Medicine and Dentistry, and Queen Mary University of London, spoke on the newly-formed Network on Noise and Health. The title of his paper was Outcomes of the European Network on Noise and Health (ENNAH). abstract Eleven parallel technical sessions, the equipment exposition, and poster sessions followed for the remainder of the day.

Hisashi Sano

Dominique Collin

Entertainment at the INTER-NOISE 2011 banquet.

Stephen A. Stansfeld

D. Keith Wilson

Entertainment at the INTER-NOISE 2011 banquet.

As on Monday, two distinguished keynote lectures in parallel sessions were presented at the beginning of Tuesday's sessions. Dominique Collin, head of acoustics at the Safran Group, France spoke on Reducing aviation environmental impact: the key role of networks. abstract Outdoor sound propagation: recent modeling developments and applications to noise control was the title of the lecture by D. Keith Wilson, a physical scientist at the U.S. Army Research and Development Center. He presented an overview of sound propagation outdoors and the new modeling techniques available for prediction of sound levels. abstract As on Monday, eleven parallel sessions, the equipment exposition, and poster sessions were held. Tuesday evening, the Congress banquet was held in the Grand Cube Osaka. The banquet began with the ceremonial opening of a barrel of Sake.

Kagami-Biraki or opening a Sake barrel. This is a traditional ceremony at a beginning of Sake parties, weddings, etc. Left to right: Hideki Tachibana, William Lang, Gilles Daigle, Robert Bernhard (partially hidden), and Ichiro Yamada.)

As entertainment, guests were treated to a Japanese-style puppet show.

Entertainment at the INTER-NOISE 2011 banquet.

Niel J. Mansfield

Yang-Hann Kim

The format used on Monday and Tuesday was also planned for Wednesday. However, one of the two parallel distinguished keynote lectures, by Franck Poisson was cancelled. Niel J. Mansfield, Loughborough University, UK, spoke on human exposure to vibration and

how it can be controlled. The title of his paper was Protecting people from vibration. abstract Parallel sessions and the equipment exposition continued until 16:00 when a second plenary lecture was given by Yang-Hann Kim of the Center for Noise and Vibration Control, Korea Advanced Institute of Science and Technology. The title of his presentation was Sound visualization and manipulation: theories and applications. abstract

The closing ceremony followed this final lecture. Congress president Yamada thanked all of those who had worked so hard to make INTER-NOISE 2011 a success. The tsunami and following nuclear disaster as well as currency issues made planning for the congress difficult, but there was a strong spirit of cooperation among the organizing committee, and in the end the event was a great success. In addition to the plenary and keynote lectures, INTER-NOISE 2011 featured a broad range of invited and contributed papers, extensive exhibitions of noise and vibration control technology, measuring instruments, equipment and systems from all over the world. Six hundred and seventy four papers were published—including plenary lectures, distinguished lectures, oral papers, and posters. In terms of number of papers presented, the first five countries were Japan (270), Korea (55), United States (47), China (36) and Germany (35). Registrants came from 40 countries, and totaled 953. Of these, 718 were regular registrants 196 were students. Accompanying persons completed the registration roster. There were 30 exhibitors, and 76 persons visited the exposition on an “exposition only” basis.

Host organizations for INTER-NOISE 2011 were the International Institute of Noise Control Engineering, The Institute of Noise Control Engineering of Japan, and the Acoustical Society of Japan. The supporting organizations were the Ministry of Land, Infrastructure, Transport and Tourism, the Ministry of the Environment, the Osaka Prefectural Government, and the City of Osaka. The congress was held in cooperation with the Japan National Tourism Organization, the Osaka Convention and Tourism Bureau, and many other Societies and Foundations.

Special advertisement by a Chindon band at the closing ceremony. Chindon band is a marching band in old time costume, which usually advertises for newly opened shops or special events, but it is rare nowadays. In these pictures, the musicians play American music "When the saints go marching in" to advertise INTER-NOISE 2012. All participants followed the marching band to the Foyer where American beer and wine were served.

2011 Congress President Yamada turns the leadership of the INTER-NOISE series over to Steve Hambric, 2012 Congress President.

Then followed an announcement by I-INCE president Gilles Daigle of 12 International INCE travel grants which were awarded to students to enable them to attend the congress. Several speakers then announced conferences related to noise control to be held in 2012, and the final speaker was Steve Hambric, president of the INTER-NOISE 2012 Congress. He invited all to attend the congress to be held in New York City on August 19-22, 2012. The presence of a Chindon Band to announce the 2012 meeting was a well-kept secret until the band appeared on the stage playing “When the saints go marching in.” The band led attendees to a closing reception sponsored by INCE/USA.

The INTER-NOISE 2011 Proceedings

The Proceedings of INTER-NOISE 2011 are available. See the last page in this issue. link

INTER-NOISE 2012 Travel Planning

Invitation

Dear Colleagues,
INTER-NOISE 2012, the 41st International Congress and Exposition on Noise Control Engineering, will be held in New York City, USA, from 19-22 August 2012. The congress is being held in conjunction with the American Society of Mechanical Engineers Noise Control and Acoustics Division (ASME NCAD) annual meeting, is sponsored by the International Institute of Noise Control Engineering (I-INCE), and is being organized by the United States Institute of Noise Control Engineering (INCE-USA). The Acoustical Society of America (ASA) and SAE International are also co-sponsoring the event.

The theme of the congress is *Quieting the World's Cities*, and we plan to hold special workshops highlighting city noise codes, and the New York City noise code in particular.

INTER-NOISE-2012 will be held at the New York City Marriott Marquis, a five star property in the heart of Times Square in Manhattan. A block of rooms has been negotiated at highly competitive rates, with complimentary internet access.

We anticipate a large, broad program of sessions on a variety of acoustics, vibration, and noise topics. As usual, a large exposition of vendors offering noise control materials, software, and measurement devices will be held. If you would like other information about the congress, please contact us via the email links elsewhere in this article.

I am looking forward to welcoming you to New York City in August 2012!

Steve Hambric
Congress President

Venue

The congress venue is the Marriott Marquis, a five star property in the heart of Times Square in Manhattan. A large block of rooms has been negotiated at highly competitive rates (324 USD, which includes all taxes) and feature complimentary internet access. The Marriott is close to all major downtown attractions, including the Theatre District, Times Square, Rockefeller Plaza, the Empire State Building, and many others. Several subway stations are within a few blocks of the hotel, and attractions such as Central Park, the Metropolitan Museum of Art, the Museum of Natural History, are a short subway ride away. There are countless dining options for both lunch and dinner, including low-cost alternatives, as well as ample shopping and entertainment.

The Marriott is easily reachable from the three major area airports via taxi or shuttle bus. We are negotiating discounted shuttle transportation rates now, and will post links to a special website for INTER-NOISE 2012 attendees in the spring of 2012.

We also have special hotel options available for student participants. Please see the INTER-NOISE 2012 for Students page for details.

Plenary Speakers

Sunday Evening, August 19 at the opening ceremony

Understanding and Complying with the New York City Construction Noise Regulation

Erich Thalheimer, *Parsons Brinkerhoff*
Charles Shamoon, *New York Department of Environmental Protection*

Monday morning, August 20

Transportation noise effects on children's cognition and health

Charlotte Clark, *Wolfson Institute of Preventative Medicine*

Wednesday afternoon, August 22

Continuing efforts and challenges to reduce the impact of airport noise in Japan

Ichiro Yamada, *Japan Aviation Environmental Center; Airport Environmental Improvement Foundation*

About New York City

New York City is a very accessible city. The city is composed of five boroughs. These five boroughs are Manhattan, Staten Island, Brooklyn, Queens and the Bronx. The boroughs are connected by bridges, tunnels and ferries thus making it easier for anyone visiting NYC to access them. New York City's five boroughs are home to some of the world's most familiar, memorable landmarks and attractions. Times Square, Central Park, the Empire State Building and The Metropolitan Museum of Art are just a few of the notable landmarks and attractions you will find on the island of Manhattan. Each of the four other boroughs contains their own iconic attractions as well. Since there is so much to see and do in NYC be sure to visit the complete list of tours and attractions on the NYC Official Guide website. This webpage as well as the entire NYCGO.COM website will help you get the most out of planning your trip to INTER-NOISE 2012 in the Big Apple. For more information about New York City and to plan your trip, please visit www.nycgo.com. You can also find more on New York City on our General Information site.

Technical Program

Technical papers in all areas related to noise and vibration control have will be presented as part of the technical program. The broad theme of the Congress is "Quieting the World's Cities," and papers of specific relevance to this theme have been especially encouraged. The Congress will feature approximately 15-20 parallel sessions as well as an area for poster presentation. Below is a list of the main conference themes.

- Active and Passive Noise & Vibration Control
- Aircraft and Space System Noise & Vibration
- Architectural Noise / Building Acoustics
- City Noise
- Community / Environmental Noise
- Consumer Product Noise
- Flow Induced Noise and Vibration
- Industrial Noise
- Information Technology Equipment Noise
- Inverse Approaches in Vibro-Acoustics
- Low Frequency Noise, Vibration and Shock
- Marine Vehicles, Structures and Underwater Noise
- Measurement and Signal Processing Techniques
- Motor Vehicle Noise, Interior and Exterior
- Noise Control Products
- Noise and Health
- Noise Policy Development, Education, Economics and Implementation
- Numerical and Analytical Techniques
- Old Meets New
- Psychoacoustic Aspects in Noise Evaluation
- Railway Noise and Vibration
- Renewable Energy System Noise
- Soundscape
- Structural Acoustics

Registration

Delegates

You may register for the joint INTERNOISE 2012 Congress and ASME NCAD Meeting on our registration website when it becomes available in the spring of 2012. The registration fee includes both conferences. More information on delegate registration and registration fees may be found at http://internoise2012.com/congress.shtml#reg

Accompanying Persons

The registration fee for accompanying persons is 125 USD. This registration fee includes:

- Complementary light breakfast and New York City Bus Tour (Monday morning);
- Opening and Closing Ceremonies and associated receptions Sunday and Wednesday evenings;
- Exposition and Exhibitors' Reception (Monday evening)

Registration Hours

Registration will open Sunday at about noon. The registration desks are on the 5th floor of the hotel. Monday & Tuesday registration will open at 07:00 and close at about 17:00. Registration will open on Wednesday at 08:00 and close at about noon.

Congress Banquet

The Congress banquet will be held at the hotel in the Marriott Broadway Ballroom on Tuesday between 19:00 and 22:00 p.m. Broadway performers will highlight the music and dancing typical of the New York City theater experience. Tickets are 125 USD per person.

Equipment Exposition

A dedicated exhibition space will enable companies to display the latest in technology and services in the areas of noise and vibration. The area will be the focal point for coffee and refreshments during breaks in the technical schedule. There will be 63 exhibitors participating. The exposition is currently sold out. A list of companies exhibiting at INTER-NOISE 2012 may be found at: www.internoise2012.com/exposition.shtml

The exposition will be open:

- Monday: 17:00 to 19:30 which includes the evening opening reception in the exposition area
- Tuesday: 09:00 to 17:00
- Wednesday: 09:00 to 11:30

Morning and afternoon coffee breaks will be held in the vendor area during the exposition.

Exhibitors may move in Monday 12:00 pm to 16:00 pm, and move out Wednesday 11:30 am to 13:00 pm. During this time the exhibition is closed to the public.

Travel Information

Travel to the Hotel

For those attendees who will be flying to New York City you may arrive at John F. Kennedy International Airport (JFK) or La Guardia Airport (LGA) both in Queens or you may also fly into Newark Liberty International Airport (EWR) in Newark, New Jersey.

From the north, Amtrak and commuter trains arrive at the Grand Central Terminal (GCT). From the South, arrival is at the Pennsylvania Station. An excellent web site has more information than the summary below. Go to http://www.nycgo.com/articles/nyc-transportation-getting-here

The options to travel to the hotel are:

By air: Buses leave from all major airports to Grand Central Terminal every half-hour. To return, buses leave from Park Ave. and 42nd St. (SE corner) to all major surrounding airports every half hour. Please go to http://www.nyairportservice.com for service to and from JFK or La Guardia for more information. Please go to http://www.newarklibertyairportexpress.com/ for service to and from Newark Liberty International for more information.

From Grand Central Terminal, you can take the Shuttle to Times Square and be within walking distance of the hotel. The Shuttle goes only between these two locations.

By rail: From Grand Central Station, take the Shuttle to Times Square. From Pennsylvania Station, take a blue subway line (A, C, or E) one stop from 34th Street to 42nd street. You will be within walking distance of the hotel.

By bus: The Port Authority Bus Terminal at 625 8th Avenue is very close to the hotel. It will be most convenient to walk or take a taxi. For subway information, go to http://www.panynj.gov/bus-terminals/port-authority-bus-terminal.html

By car: See http://www.marriott.com/hotels/maps/directions/nycmq-new-york-marriott-marquis/
For more on New York City transportation, go to http://www.nycgo.com/articles/nyc-transportation-getting-here#4

Getting Around in the City

The easiest form of transformation is the subway. Purchasing a Metrocard can be done at any station at the kiosk for any amount of money depending on how often you plan on riding. Times Square is very well connected having A, C, E, N, Q, R, 1, 2, 3, and 7 trains. The A, C, E (Blue) trains, and 1, 2, 3 (Red) trains will take you anywhere you would like to go on the West side, up or downtown. The N, Q, R (Yellow) trains will take you farther East. If you have three to four people in your party you may want to try taking a taxi particularly if your destination is within the island of Manhattan.

General Information

Visa
Requirements for entry into the USA from foreign destinations vary according to country. Please check with the nearest US embassy or consulate for passport and visa information.

Additional information on entry visa requirements and local consulate/embassy offices can be found here.

Climate
During the month of August participants can expect an average temperature of 31°C (88°F), but the humidity will make it feel warmer. In the evenings temperatures can cool off to a low of 24°C (75°F). Also the average rainfall during the month of August is around 4.1". For longer-term climate information, visit www.nycgo.com/articles/nyc-weather to learn about New York City's temperate climate, which changes with the seasons.

Time Zone
New York City is in the Eastern Standard Time Zone (Greenwich Mean Time minus four hours during daylight saving time, from March through November, and minus five hours the rest of the year).

Currency and Credit Cards
The unit of currency is the U.S. dollar (USD). This converter allows you to determine the value of other currencies compared with the dollar. To locate places where you can exchange your currency for U.S. dollars please visit www.nycgo.com/basic-info/. Exchange counters are also located throughout the airports. Internationally recognized credit cards are accepted at most hotels, shops, and restaurants.

Taxes and Tips
Travelers may not be familiar with the way taxes and tips affect New York City price tags. Check here for information about taxes and gratuities in New York City.

Electricity
Most hotel outlets are 110 volts AC at 60 Hz. Always check the power supply before using electrical equipment.

Language
The official language of the congress is English.

Official Invitation
A personalized letter can be obtained upon request. The Organizing Committee will be happy to send a personal invitation for participation in the Conference. It must be understood that such an invitation is only to help visitors obtain funds for travel and accommodation or a visa and is not a commitment on the part of the Organizers to provide any financial support. Please contact the Conference Secretariat, secretariat@internoise2012.com.

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A new method for predicting the annoyance of transportation noise

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Abstract

The percent of people who are highly annoyed by exposure to similar levels of transportation noise varies considerably from one community to the next. Nonetheless, the federal definition of a "significant" noise impact ($L_{dn} \geq 65$ dB) reflects a one-size-fits-all policy decision that accounts for neither source- nor community-specific differences in the annoyance of aircraft, road traffic, and rail noise. Current U.S. noise regulatory policy is based on outdated information and purely descriptive statistical analyses, which offer no explanation for variability in annoyance prevalence rates from community to community. An ISO Working Group is currently considering adoption of a novel method for predicting the annoyance of transportation noise. If this paradigm-shifting approach is adopted as an international standard, it is likely to affect routine methods for predicting and disclosing environmental noise impacts, and to result in changes in federal noise regulatory policy in years to come.

Introduction

All sound level meters are expected to react identically when they are exposed to the same noise. If one sound level meter behaves differently from another, we suspect that one, the other, or both might be out of calibration. In contrast, not everybody responds the same way to the same dose of medicine. Some people tolerate large doses well, while others respond alarmingly to even the smallest doses of the same medicine. Still, we don't think of people who respond differently from others to a particular dose of medicine as "out of calibration."

When different communities are exposed to similar doses of transportation noise, should we expect them to respond as sound level meters respond to noise, or as people respond to medicine? Should the *same* community respond identically to railroad, street traffic, and aircraft noise, just as a sound level meter would? If noise doses that differ a thousand-fold in acoustic energy annoy the same percentages of residents of two different communities, should we suspect that one or the other or both of the communities are out of calibration, or should we question the expectation that noise affects communities precisely as it affects sound level meters?

Put another way, do we all have little sound level meters in our heads that we consult to determine whether we are annoyed? Is community response to noise just a deterministic summation of everyone's identical response to noise and to noise alone? These questions may seem fatuous, but answering them requires re-thinking issues that remain unresolved after more than half a century of concern. The questions touch on issues of federal regulatory policy, and on the degree to which U.S. environmental impact disclosure documents comply with requirements of the National Environmental Policy Act. A little history is helpful in understanding why the answers to these questions are not as simple as acoustical engineers might hope.

The earliest formal approach to predicting community response to transportation noise was motivated by efforts to describe the reactions of residents of neighborhoods on and near military bases to the introduction of jet aircraft in the early 1950s. Since the researchers who devised the "Community Noise Rating", or CNR system, were experienced World War II-era acousticians, it's hardly surprising that the CNR system focused on estimating a "noise level rank" from a set of idealized spectral shapes for community noise.

These shapes were derived from laboratory findings about the *loudness* of sounds in different frequency bands: not about their absolute sound pressure levels, A-weighted or otherwise, but about their *loudness*. The noise level ranks were normalized to standard conditions by site-specific factors such as ambient noise levels, time of day and year, tonal content, dynamic range of noise intrusions, and novelty of exposure.

This pragmatic approach to identifying acoustic characteristics of aircraft noise that could potentially affect annoyance was wholly descriptive and precedent setting. The acousticians of the 1950s wasted little time in speculation about why communities reacted adversely to aircraft noise, nor in identifying any mechanisms that converted noise exposure into complaints, nor even on quantifying the prevalence of aircraft noise annoyance. Until modern social surveys of community reaction to aircraft

noise began in the 1960s, there wasn't much empirical information to fuel such speculation in any event.

The 1969 National Environmental Policy Act requires disclosure – which is to say, prediction – of the impacts of noise exposure associated with major federal actions, including road, rail and airport infrastructure projects. Two decades ago, the Federal Interagency Committee on Noise (FICON, 1992) identified annoyance – not speech interference, not complaints, not sleep disturbance – as the primary effect of transportation noise on communities. The committee also decided that prediction of the prevalence of a consequential degree of annoyance in communities, as summarized by a particular dosage-response relationship, was the best way to gauge transportation noise impacts.

Figure 1 shows the dosage-response relationship that FICON endorsed for all forms of transportation noise. The relationship is plotted as it is usually – but misleadingly – shown, without its underlying data. FICON's curve was billed at the time as an "update" of an eyeball fit to 161 data points that Theodore Schultz had compiled fourteen years earlier.

Schultz (1978) had been the first researcher to assemble a comprehensive database of the planet's entire stock of social survey information about the annoyance of transportation noise. His database included findings of social surveys of reactions to street traffic, railroad, and aircraft noise, conducted at different times and in different places, in different languages, using different questionnaire items and response scales. Controversy over most aspects of Schultz's analyses raged for several years before they became accepted as the conventional wisdom by the mid-1980s.

FICON's admirably simple, elegant and widely-recognized S-shaped curve has been the rock on which most U.S. federal agencies have built their guidance for interpreting the results of environmental noise impact analyses, and for defining their "significance." It is thus unfortunate that the curve is demonstrably incorrect. The relationship is inaccurate and imprecise; it systematically *under*estimates the prevalence of aircraft noise annoyance actually measured in most field studies; it accounts for only a small amount of variance in the relationship between aircraft noise exposure and annoyance in communities worldwide; and it offers no explanation whatsoever for the enormous range of reactions to transportation noise exposure from one airport community to the next.

The *really* bad news, though, is that to this day, the FICON curve is still unsupported by *any* quantitative or systematic understanding of the origins and mechanisms of community reaction to transportation noise. Even though the curve is based on nothing more than a purely descriptive curve fit to a selective, 20-year old set of survey findings, decisions about the award of billions of dollars of federal subsidies to construct transportation infrastructure and to mitigate noise impacts still ostensibly rest on its arbitrary shape.

Inadequacies of Purely Descriptive Predictive Functions

It is apparent from Figures 2 and 3 that the FICON curve doesn't fit either the aircraft data alone, nor the combined set of aircraft, road and rail noise data very well. If the FICON curve is to be used to predict generic transportation noise impacts—that

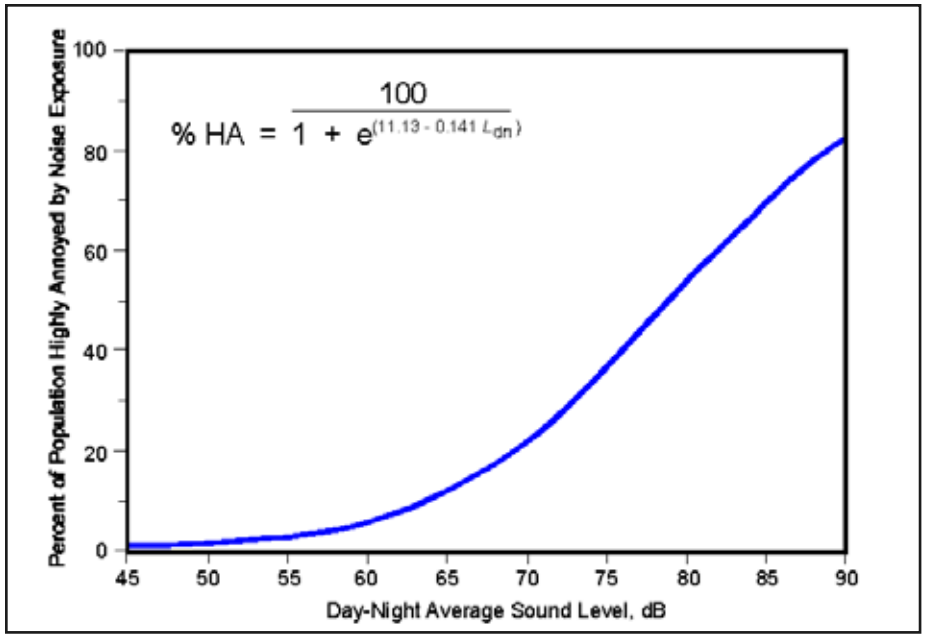

Figure 1. 1992 FICON dosage-response relationship

is, to represent the center of the cloud of field observations of the annoyance of transportation noise—it clearly needs to move to the northwest by roughly 5 to 10 dB. Better yet, separate functions for aircraft, road, and rail data would be more useful, as suggested by Miedema and Vos in 1998, just six years after the FICON curve had been published.

The greater problem is not that the FICON curve doesn't come close to representing the center of a cloud of data points, however; it's that the data themselves are so variable that even if the FICON curve were shifted 5 or 10 dB to the left on the abscissa, predictions based on the curve would remain so uncertain that they would have little applicability to most individual communities. At a level of aircraft noise exposure associated with a DNL value of 65 dB, for example, the actual prevalence of annoyance in communities worldwide varies over a range from roughly 5% highly annoyed to about 80% highly annoyed. Put another way, communities in which the prevalence of annoyance empirically corresponds to that which the FICON curve associates with a DNL value of 65 dB vary in actual exposure levels over a range on the order of 40 dB.

The FICON curve *can't* account for this great variability, because it possesses no more meaning or explanatory power than any other arbitrary curve. It's just a polynomial that says nothing about any underlying causal relationship between noise exposure and annoyance, and has no deeper interpretation than as a (poor) estimate of the middle of a distribution of pairs of X and Y values. Sadly, predictions about noise impacts in stereotypically average communities in the center of a cloud of data points simply aren't very useful in most other communities. In fact, reliance on *any* purely descriptive function for predictions of average annoyance prevalence rates ignores the inconvenient reality that the predictions are so imprecise that they are likely to be far from the mark when applied to any particular community.

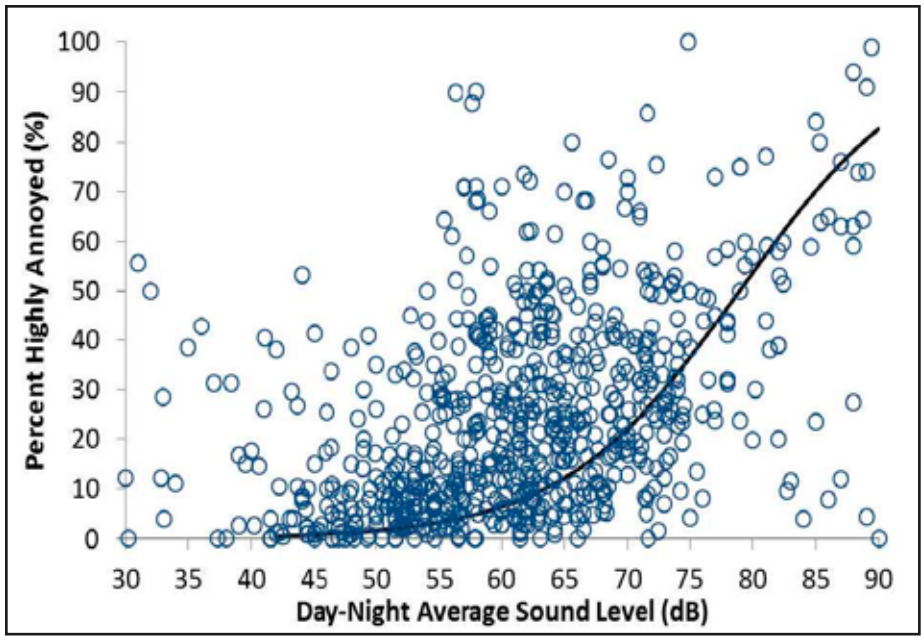

Figure 2. Fit of FICON function to 545 observations of annoyance of aircraft noise

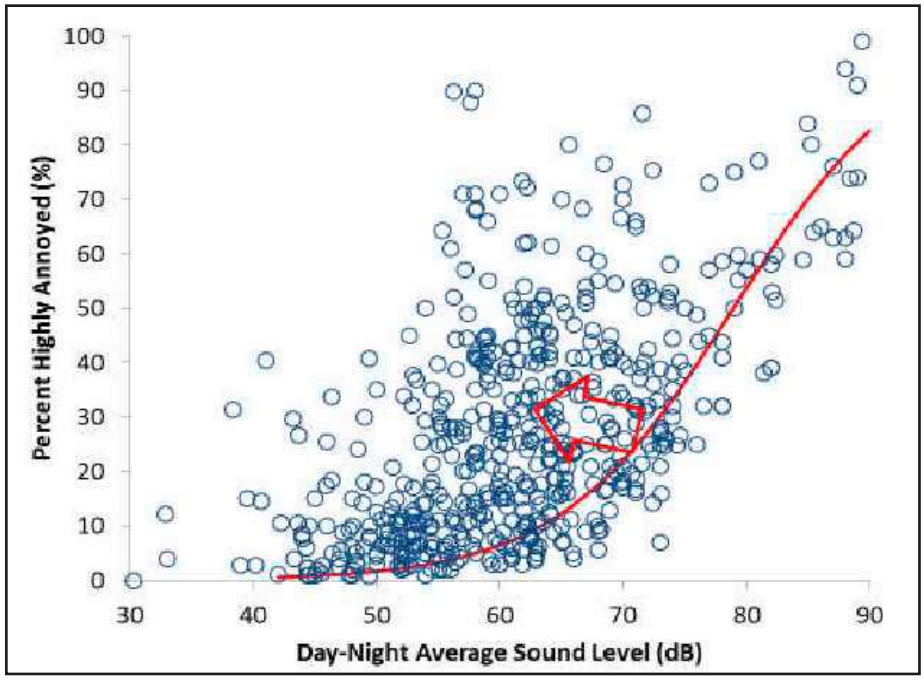

Figure 3. Fit of FICON function to 1056 observations of the annoyance of road, rail, and aircraft noise

When noise impact predictions for individual communities turn out to be erroneous, the public loses confidence in the ability of planning agencies to predict noise impacts, and in official policy guidance. Lack of confidence in turn compromises the policies that are supposedly based on the predictions, to the point that the policies cannot accomplish their own objectives. Vigorous public opposition to projects which purportedly produce no significant noise impacts is more the rule than the exception.

FICON's goal in 1992 for endorsing an annoyance prediction method was an expedient one. The approach that FICON endorsed was intended primarily

to reinforce a simplistic rationale for a purely acoustic approach to the challenges of compliance with NEPA requirements. Advancing systematic understanding of community reaction to environmental noise, and encouraging investigation of the causes of noise-induced annoyance, were among the least of FICON's concerns.

For purposes of predicting community response to transportation noise, relying on DNL as a *sole* predictor of annoyance assumes that people make annoyance judgments precisely as a true rms sound level meter integrates acoustic energy to measure DNL values. This might be a fine way to predict community response if annoyance judgments depended solely upon the readings of little sound level meters inside our heads, but the data strongly suggest otherwise.

The important questions for predicting noise impacts are NOT limited to "where's the middle of this data set?," but also include "What factor(s) account for the enormous range of noise exposure levels observed at similar annoyance prevalence rates?", "What's the best way to represent the net influences of all of the non-acoustic factors that might be at play?", and "How can more credible predictions be made?" For such purposes, curve fitting exercises conducted with generic statistical tools use the wrong tool to solve the wrong problem. Further, regression analyses aren't all that useful within the range of exposure conditions of greatest pragmatic interest for most transportation infrastructure projects—the 20 dB range of Day-Night Average Sound levels from about 55 to 75 dB. As Figure 4 shows, the correlation between exposure and annoyance is negligible within this range of exposure values.

Regression analysis is often undertaken when understanding of the relationship between independent and dependent variables is lacking. In fact, the entire concept of cause and effect is irrelevant to regression analysis, because the technique is indifferent to which variable is considered the predictor and which the predicted variable. In other words, if one knows nothing about the relationship between x and y variables, regression analysis can be a useful method for predicting either one from the other.

First Principles Approach

A fair amount *is* known about the relationship between noise exposure and annoyance, however. Nobody is confused, for example, about which variable causes the other. Three well established and widely accepted understandings include the following:

- Duration is a fundamental difference between loudness and annoyance. Once a sound attains a duration of about a quarter of a second, the sensation of loudness does not increase, but its annoyance does, at a rate of 3 dB per doubling of duration.
- It's been known for more than half a century that loudness grows as the 0.3 power of acoustic energy. (The fact that loudness grows as the 0.3 power of level is the basis for the well-known rule of thumb that loudness changes by a factor of two for every 10 dB change in sound level.)
- It's also been well understood since the first modern social survey of the annoyance of aircraft noise in 1961 that annoyance prevalence rates are dependent in part on non-acoustic factors.

Since annoyance is closely related to duration-adjusted loudness, it's reasonable to assume that the basic growth rate of annoyance with exposure should be that of duration-adjusted loudness. An estimate of the effective loudness of noise exposure can thus be derived by transforming Day-Night Average Sound Levels into a duration-adjusted dose, *m*, to convert pressure units into a quantity proportional to loudness:

$$m = (10^{(DNL/10)})^{0.3}$$

Predicted annoyance prevalence rates for the calculated dose may then be computed as $p(HA) = e^{-(A/m)}$, where A is a non-acoustic decision criterion, per Green and Fidell (1991). This is where the new method departs fundamentally from regression analysis. In regression analysis, a curve is sought which is closest on average to all of the data points. In the current method, the goal is to select the value of A which best describes the fit of the data from a particular community to an *a priori* transition function.

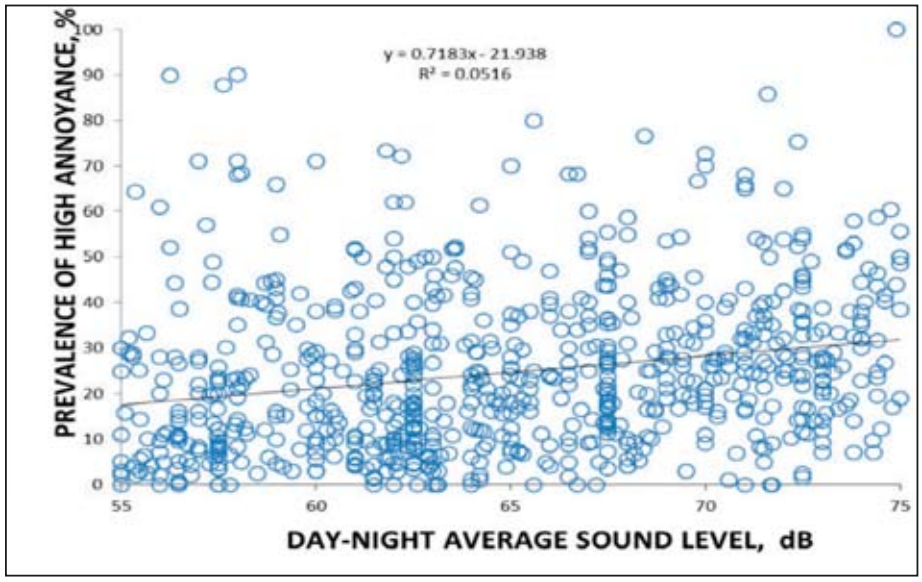

Figure 4. Poor correlation between exposure and response in exposure range of greatest pragmatic concern.

As described by Fidell *et al*. (in press), the function $e^{-(A/m)}$ is the simplest of transition functions. The community-specific constant, A, is found by minimizing the root-mean-square deviation of the annoyance prevalence rates observed at the interviewing sites in each community from those predicted by an exponential function with a slope equal to the rate of growth of loudness with level ("the effective loudness function"). This process slides the effective loudness function along the DNL axis to the point at which a best fit between the predicted and observed points occurs. The value of A that yields the best fitting value for a community's response data to the effective loudness function may then be linearly transformed into a value on the exposure axis that reflects the aggregate influence of all non-DNL related factors on annoyance judgments in a given set of field observations.

One minor complication arises when the family of curves described by the function $e^{-(A/m)}$ is applied to individual communities. The complication is finding a standard way to anchor the curve to a point on the DNL axis so that its position can be easily described. All that's required, however, is to pick some point on the function, and then drop a perpendicular to the abscissa at that point. For reasons of convenience, the "middle" of the function—the point at which half of the people in the community describe themselves as highly annoyed by noise exposure, and half do not—is an obvious choice. The choice is arbitrary, affects only a constant, and can be chosen without loss of generality.

Once a point is selected, a community's tolerance for noise can be described in units of DNL—an acoustic quantity, measured in units of decibels. If the middle of the effective loudness function is selected, the value of DNL at which half of the people in a community describe themselves as highly annoyed by transportation noise serves as a Community Tolerance Level, or "CTL" value, that greatly simplifies comparisons of various survey findings.

Community Tolerance Levels for Aircraft, Road, and Rail Noise

Figures 5 and 6 show the fits of a number of aircraft, road, and rail noise surveys to the effective loudness function. Although not all community-level data fit the function as well as those shown, the function accounts for the majority of the variance in the majority of the studies. The distributions of Community Tolerance Levels for aircraft and road traffic noise are Gaussian. For aircraft noise, the mean L_{ct} = 73.3 dB and the standard deviation is 7 dB. For road traffic noise, the comparable figures are L_{ct} = 78.3 and 5.1 dB. The difference in mean CTL values for aircraft and road traffic noise indicates that on average, communities are 5 dB more tolerant of road traffic noise than of aircraft noise.

Ground borne vibration exposure complicates matters somewhat in the case of community response to railroad noise. Survey findings for low and high vibration cases form readily apparent groups, in which high levels of vibrations and rattles appear to be associated with low tolerance for noise exposure, and *vice versa*. The Japanese high speed Shinkansen train does not fit well in either group.

Estimates of CTL values for the low vibration trains are L_{ct} = 87.8 dB (with a standard deviation of 3.5 dB), and L_{ct} =75.8 dB (with a standard deviation of 4.0 dB) for the high vibration trains. In other words, communities grouped as described above are about 12 dB more tolerant of train noise accompanied by low vibration levels than of the noise of trains accompanied by high vibration levels. In contrast, the average CTL for all trains (except the Shinkansen) grouped together is 83.5 dB. Tolerance for the noise of a high speed train in a single study was found to be about 15 dB lower than for trains accompanied by high vibration levels. Further detail about these findings may be found in Fidell *et al*. (in press) and in Schomer *et al*. (in press).

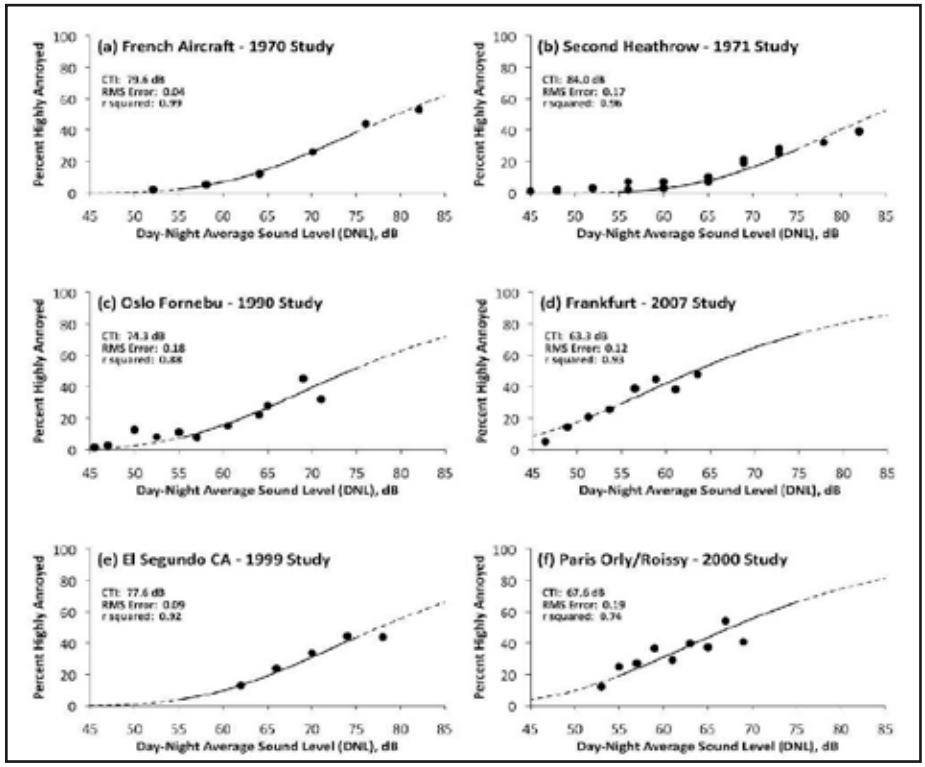

Figure 5. Fits of community response data for several aircraft noise annoyance studies

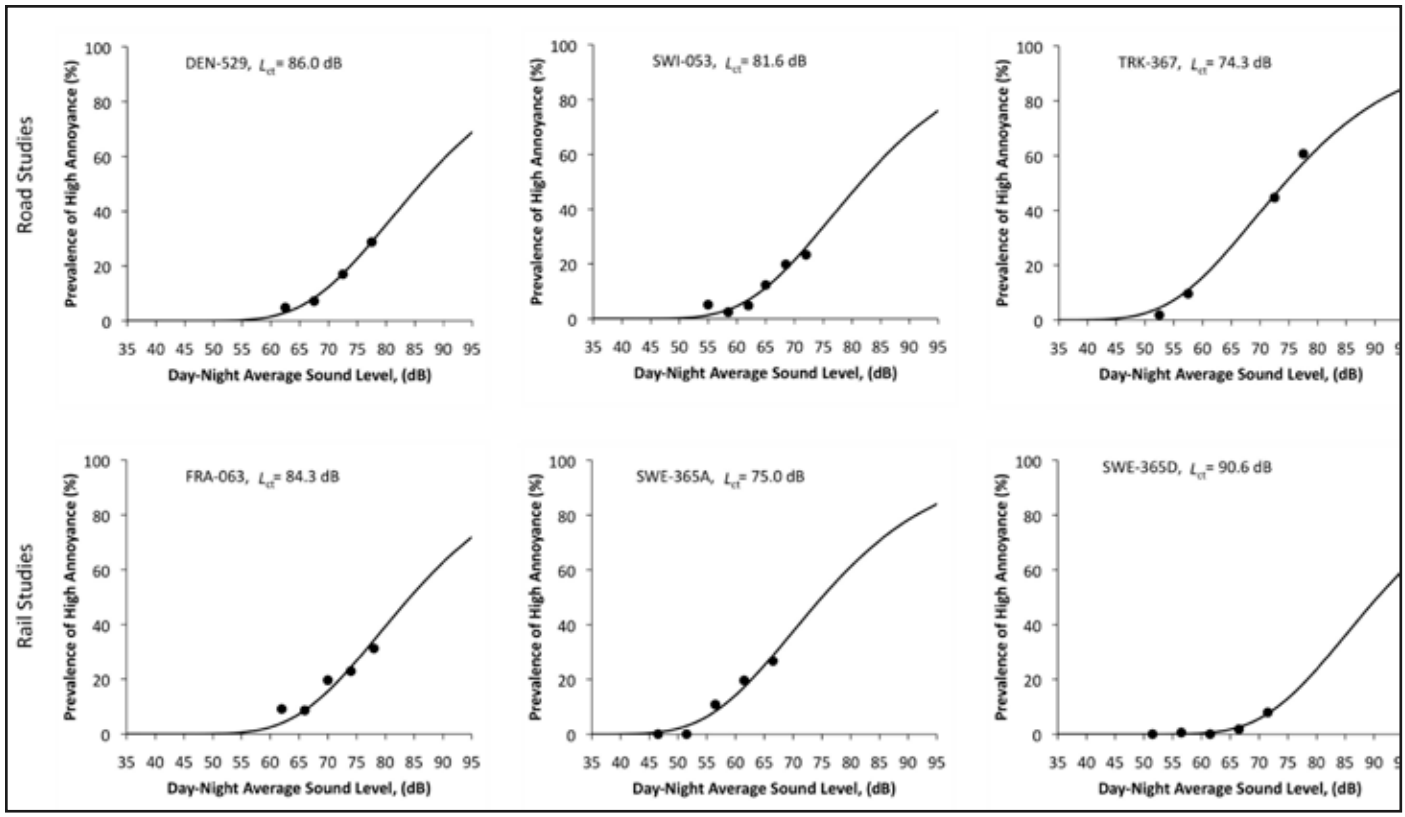

Figure 6. Fits of community response data for several road and rail noise annoyance studies

Conclusions

The present findings indicate that more accurate predictions of the prevalence of annoyance with transportation noise in communities may be obtained by joint consideration of 1) estimates of the duration-corrected loudness of noise exposure, and 2) estimates of community-specific tolerances for noise exposure. The relationship between average annoyance prevalence rates and noise exposure derived as described above closely resembles dose-response relationships for transportation noise derived by Miedema and Vos (1998) by regression analysis. This close resemblance provides further pragmatic reason to believe 1) that the dose-related determinants of annoyance are driven by duration-corrected loudness, and 2) that when applied to any given community, predictions of response to transportation noise exposure which are derived from generic statistical analyses must be adjusted by the tolerance of that community for noise exposure.

Acknowledgements

The authors are grateful to the Office of the Secretary of the U.S. Department of Transportation, and to FAA's Office of Environment and Energy, for funding research supporting portions of the analyses described above.

This article is based on a distinguished plenary lecture presented by Dr. Fidell at the NOISE-CON 2011 Conference on July 26, 2011.

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European News

Bernard Berry, European Editor

Europe

CAETS Takes a Position on Motor Vehicle Noise

Through its Noise Control Technology Committee (NCTC), the International Council of Academies of Engineering and Technological Societies (CAETS) took a position on European vehicle noise requirements. On November 29, 2011, NCTC Chairman Tor Kihlman wrote the following letter to the European Commission:

> Dear Vice-President Tajani, Vice-President Kallas, Commissioner Potocnik:
>
> According to the information I have, the Commission's proposal on new limits for road vehicle noise emission, soon to be published, will be in line with Option 5 in the VENOLIVA report. This would mean a very minor first step to decrease the severe health effects among the EU citizens due to traffic noise.
>
> Also, according to available information, it appears that Germany will oppose the limits due to national industry interests for very powerful cars. If Germany is successful in its attempts to weaken noise emission limits, it would not be the first time that specific national industrial interests stop noise reduction progress.
>
> This is very worrying and not in the interest of the European citizens exposed to excessive traffic noise today.
>
> It is unworthy for a democratic Europe to expose so many of its citizens to unhealthy traffic noise levels when we have cost effective technology available for substantial noise emission reductions.
>
> On behalf of the CAETS Noise Control Technology Committee (NCTC), I urge you not to weaken the Commission's proposal but on the contrary to include in the decision a further strengthening of the noise limits from the year 2020 as proposed by the CAETS NCTC in earlier letters.
>
> The limits from the year 2020 should be set for cars at 3 dB lower than Option 5 in the VENOLIVA report and 4 dB lower for vans and trucks to be fulfilled for all new vehicles by January 2020. The reason to adopt this now is that the industry needs the lead time to apply the technology.
>
> Tor Kihlman

The NCTC has also taken positions and made presentations on other matters related to noise control technology. For a listing, see http://www.caets.org/cms/7123/9996.aspx

Vehicle Noise to be Reduced

On December 9, 2011, the European Commission proposed to reduce noise produced by cars, vans, buses, coaches, light and heavy trucks. Noise limit values would be lowered in two steps of each 2 dB(A) for passenger cars, vans, buses and coaches. For trucks the reduction would be 1 dB(A) in the first step and 2 dB(A) in the second step. The first step is to apply two years after the publication of the text once approved by the European Parliament and Member States, and the second step is foreseen three years thereafter. Altogether, these measures will reduce vehicle noise nuisance by some 25%. In addition, the Commission intends to introduce a new and more reliable test method to measure sound emissions. Moreover it is proposed that electric and hybrid electric vehicles can be fitted optionally with sound generating devices which would make these cars safer. Noise emissions limits have not changed since 1996 despite increasing traffic.
The World Health Organization concluded that traffic related noise may account for 1 million healthy years of life lost per year in Western Europe. Hence, reduction of traffic noise is essential to improve the health and quality of life of Europe's citizens.
Vice-President Antonio Tajani, responsible for Industry and Entrepreneurship said: "Noise emissions due to road traffic, from which our citizens are suffering, will be significantly reduced. Our proposal will lead to quieter motor vehicles on our roads and a healthier environment. Our proposal will also make international rules for industry clearer, so it will be easier for European manufacturers to sell cars outside the EU".

Background

New noise limits measured with a new test method. The proposal on reducing vehicle noise includes passenger cars, vans (light commercial vehicles), buses, light trucks, coaches and heavy trucks. It will ensure that the noise levels of new vehicles will be measured by a new and more reliable test method.

To this end, so-called additional sound emission provisions (ASEP) will be included. These are preventive requirements which will ensure that the sound emissions of a vehicle under street driving conditions will not differ significantly from what can be expected from the type-approval test result for this specific vehicle.

Electric and hybrid electric vehicles. So-called 'Approaching Vehicle Audible Systems' requirements shall ensure that only adequate sound generating devices are used which will also lead to a harmonization of the applied technology. The fitting as such would remain an option for the vehicle manufacturer. This will increase road safety and undoubtedly help avoiding road-accident injuries.

A global benefit. Having the same basic rules throughout the EU makes it easier to buy, sell and use vehicles in any Member State – and ensures equal health, safety and environmental standards across the EU.

With this proposal the current EU rules applicable to noise emissions from vehicles will be updated and further aligned with internationally recognized UN standards. This should enable to improve market access for European car manufacturers in those third countries which are contracting parties to the UNECE Agreement of 1958 and thus boost the competitiveness of European industry.

The proposal of the European Commission is now to be submitted to the European co-legislators, the European Parliament and to the Council.

More information on:

- Noise emissions of motor vehicles: http://ec.europa.eu/enterprise/sectors/automotive/environment/noise/index_en.htm
- The European Commission's automotive policy: http://ec.europa.eu/enterprise/sectors/automotive/index_en.htm
- T&E briefing on the new regulation: http://www.transportenvironment.org/publications/new-eu-vehicle-noise-limits

United Kingdom

Bernard Berry Receives a Lifetime Achievement Award

Note by George Maling, Managing Editor: I am pleased to report that our European Editor, Bernard Berry, received a Lifetime Achievement Award from the Noise Abatement society. The Award was made in the UK House of Commons on December 8, should be 2011. This is the citation for the Award.—Ed.

Bernard Berry has been awarded this accolade for his continuing work and expert advice on the effects of noise.
He has been a consultant to industry, Governments, local governments, the EU and has collaborated on research projects with a number of organisations.
He is an Adviser to the World Health Organisation [WHO] European Centre for Environment and Health [ECEH] in Bonn, and a member of the WHO Working Group on Aircraft Noise and Health.
He has published over 120 papers in academic journals and conference Proceedings, reports and book chapters, and given more than 100 presentations at conferences.

He is Chairman of the main British Standards Institution [BSI] Technical Committee on Acoustics.
He was President of the Institute of Acoustics from 1996-1998. And was the Institute's Vice-President for International Relations from 2001 to 2007. In October 2009 he was presented with the Institute's Award for Distinguished Service – "for his outstanding contribution to the life of the Institute".

In April 2010 he was elected a Distinguished International Member of the Institute of Noise Control Engineering of the United States of America. This distinguished, honorary status is conferred upon individuals who have personally made extraordinarily significant contributions to the theory and/or practice of noise control engineering. For more information, see http://noiseabatementsociety.com/john-connell-awards/john-connell-awards-2011-2/

Bernard [left] receives the UK NAS Lifetime Achievement Award from Daniel Instone of Defra

Pan-American News

Paul Donovan, Pan-American Editor

USA

International Noise Awareness Day

The Center for Hearing and Communication founded International Noise Awareness Day to promote awareness of the dangers of long-term exposure to noise. Join us and professional organizations, community activists and individuals around the world in celebrating the **17th Annual International Noise Awareness Day on April 25, 2012**.

The content in the online Noise Center will give you information and direction you'll need to be part of this important global initiative. Should you need further guidance or assistance getting started, please contact Nancy Nadler at the Center for Hearing and Communication in New York at (917) 305-7810 or send an e-mail to nnadler@chchearing.org.

Nominations Due for INCE/USA 2012 Awards

For 2012, the Institute of Noise Control Engineering (INCE/USA) and the INCE Foundation intend to present two major awards: the INCE Distinguished Noise Control Engineer Award and the Martin Hirschorn IAC Prize – Best Paper Award. It is planned to present both awards at the upcoming INTER-NOISE conference in New York City, in August, 2012. This is an invitation to nominate a distinguished noise control engineer or submit an applicable published paper for these awards, respectively. A brief summary for both awards, including submission deadlines, is provided below.

To receive instructions for a Hirschorn Best Paper Prize submission or INCE Distinguished Noise Control Engineer Award nomination please send a request to:

Paul L. Burgé, INCE Bd. Cert.
INCE VP, Honors & Awards Committee
URS Corporation
4225 Executive Square, Suite 1600
La Jolla, CA 92037
(858) 812-8282
E-mail: paul.burge@urs.com

Martin Hirschorn IAC Prize – Best Paper Award
Award amount: 4000 USD cash prize
Submission Deadline: April 15, 2012

This prize is awarded to the best paper on "new and/or improved cost-effective noise control and/or acoustical conditioning products" as published in the two calendar years preceding the award (2010 or 2011). Papers published in the INCE/USA Noise Control Engineering Journal that meet this description will automatically be considered, but papers published in other journals or proceedings during the qualifying time period that meet the above description may also be submitted for consideration.

INCE Distinguished Noise Control Engineer
Special Memento and Framed Certificate
Nomination Deadline: April 15, 2012

The INCE Distinguished Noise Control Engineer Award recognizes an individual who has rendered conspicuous and consistently outstanding service to the Institute and to the field of noise control engineering over a sustained period, and shall be widely recognized for technical excellence, leadership, and professional integrity. Any Member of INCE/USA who is Board Certified may nominate an individual for the INCE Distinguished Noise Control Engineer Award.

A suitable nomination package for this award is not trivial and will take some time to prepare, so please request the nominating instructions well before the submission deadline.

Cavanaugh Tocci consultants work on The Modern Theatre

The newest theatre in Boston is also one of the oldest. The new Modern Theatre on Washington Street opened in fall 2010. The latest incarnation of this historic theatre is the result of a complete reconstruction designed by CBT Architects and built by Suffolk Construction. Cavanaugh Tocci Associates was responsible for consulting in audiovisual systems, room acoustics, sound isolation, and mechanical equipment noise control.

The theatre is designed to allow multiple stage and audience configurations to support drama and music performance; lecture; film screening; and television broadcast.

The historic building in Boston's theatre district was purchased and renovated by Suffolk University. The building was in poor condition at the time of purchase. Under the supervision of CBT Architects, important elements of the historic façade were preserved. The building was originally a warehouse with an 800 seat theatre on the first floor. The upper floors of the building are now student housing, and the lower floors house the theatre and support spaces. The new 195 seat theatre is fully equipped with rigging, lighting, and audio to stage high quality productions in a very intimate setting. This small venue complements the larger theatres in the area and provides a superb teaching facility for Suffolk University.

CTA worked with CBT Architects to design a floating concrete floor to isolate the theatre from airborne and impact sound in the student housing suites above. The theatre ceiling is a perforated steel deck with integral hanging points for production equipment. CTA also worked closely with CBT to provide the right balance of sound-reflective and absorptive finishes for both speech and music.

The original 1914 Modern Theatre opened in 1914. It was the first venue in Boston specifically designed to show motion pictures. The theatre continued to be on the leading edge of technology, being the first in Boston to show *The Jazz Singer*. Like the original, the new theatre has extensive technology with an advanced audiovisual system designed to support the theatre's full range of activities. A digital mixing console anchors a full theatrical audio system and complements a cinema-quality video system including surround sound. An extensive system of tie-lines accommodates multi-camera video shoots with both coaxial and fiber-optic lines to serve broadcast trucks and internal recording setups.

The new Modern Theatre will provide a very high-quality performance venue for decades to come. Cavanaugh Tocci Associates is pleased to have been a part of this very special project.

Asia-Pacific News

Marion Burgess, Asia-Pacific Editor

Australia

Wind Farm Noise

The report on wind farm noise (www.aph.gov.au/senate/committee) mentioned in the September issue of this magazine has been followed in December of 2011, by the release of the NSW draft Planning Guidelines for Wind Farms. The noise limits in these guidelines have been set at 5dB(A) below the lowest current acceptable noise criteria for a suburban or rural amenity area in NSW, i.e., at a limit of 35 dB(A). There is the option for 'negotiated agreements' between the proponent and the land owner who may be affected. For more information on these draft guidelines see the links from www.planning.nsw.gov.au/

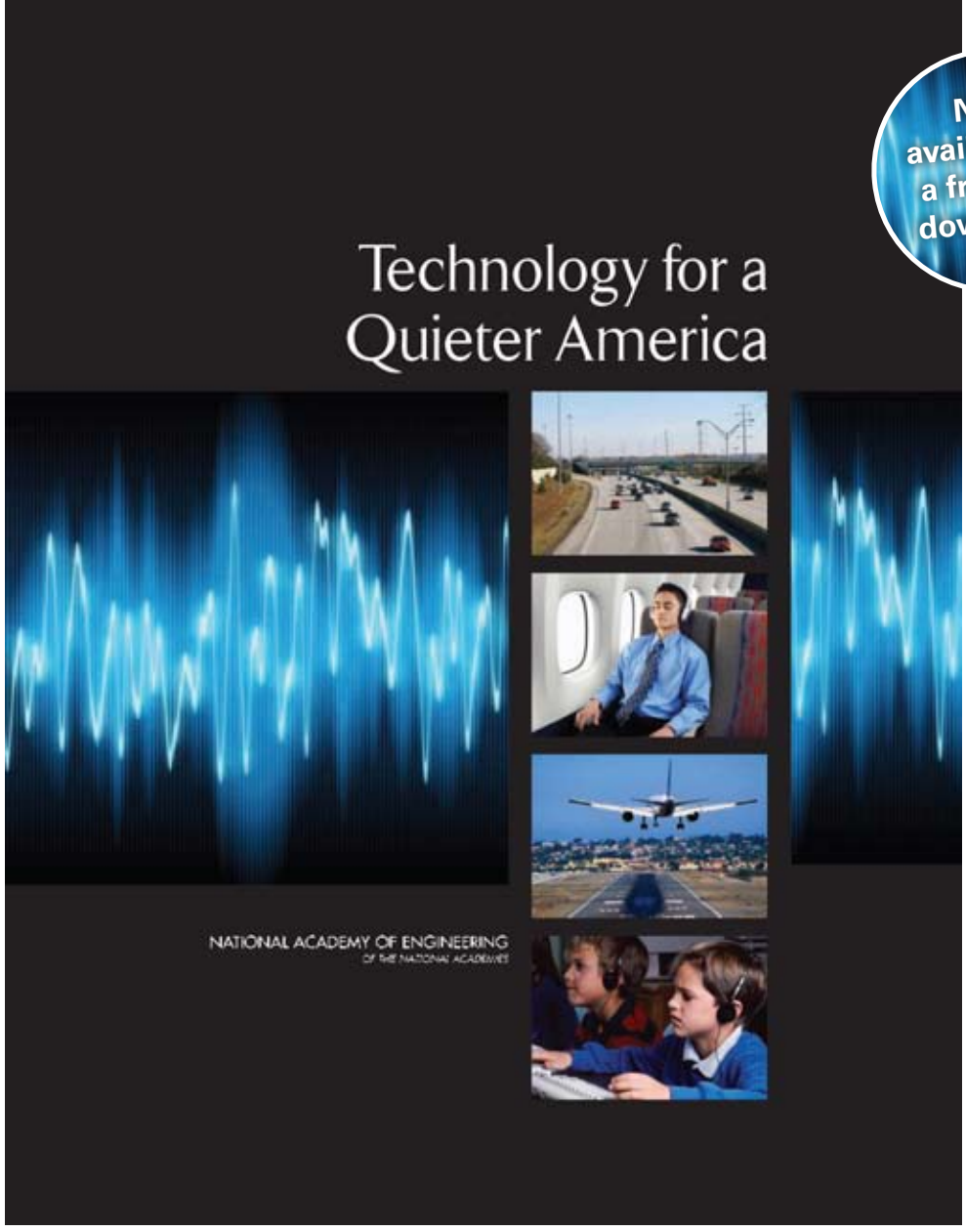
Japan

Manual for Road Traffic Noise Monitoring

Japanese Noise Regulation Law specifies monitoring of noise levels in designated areas around roads. Prefectural governments are responsible for this noise monitoring. In November 2011, the regulation was revised and all cities in each prefecture were added to the law as organizations with responsibility to this activity. This means more than 800 local city offices are newly involved in the monitoring for road traffic noise as a mandatory work. In relation to this revision, MOE (Ministry of the Environment) completed a manual for the detailed procedure and distributed it to prefectural governments and city offices.

The manual describes methods for the determination of noise levels to which respective buildings are exposed. The levels are calculated by a road traffic noise simulation model with an aid of traffic condition, road structure, area map with distribution of buildings and so on. Noise measurement at a reference point close to a road is available to calibrate the calculated data. The calibration is to correct the level difference attributed to the factors such as age of pavement and type of vehicles which are unique to the individual local areas.

The manual also describes the method to assess the noise level ($L_{Aeq,16h}$ and $L_{Aeq,8h}$). The assessment is made by obtaining numbers and rates of the houses at which noise levels exceed the environmental quality standards stipulated for the respective areas. The noise monitoring area is within the range of 50m from road. All local office shall perform the noise monitoring every year and forward the results to the national government.



In 2006, NAE initiated *Technology for a Quieter America*, a multi-year study to review state-of-the-art noise-control engineering, describe the technological, economic and political climate for noise control, and identify gaps in research. During the past three years, a 14-member umbrella committee, chaired by NAE member George Maling (managing director emeritus of the Institute for Noise Control Engineering of the USA), five subcommittees, and focused working groups have explored three categories of issues related to noise-control engineering and public concerns: applications of current technologies; research and development initiatives; and intra-governmental and public relations programs. The report is now available from the National Academies Press.

Technology for a Quieter America assesses major sources of noise (transportation, machinery and equipment, consumer products, etc.), how they are characterized, efforts to reduce noise emissions, and efforts to reduce noise in work places, schools, recreational environments, and residences. The report reviews regulations that govern noise levels and the roles of federal, state, and local agencies in noise regulation. It also examines cost-benefit trade-offs between different approaches to noise abatement, the availability of public information on noise mitigation, and noise-control education in U.S. schools of engineering.

Findings of the report focused on several critical areas: Hazardous noise-Occupational noise exposure limits should be reduced and engineering controls should be the primary focus of controlling workplace noise. "Buy-quiet" programs that promote the procurement of low-noise equipment and allow market forces to operate can play an important role.

Cost Benefit analysis: The Federal Aviation Administration has been proactive in cost-benefit analysis of noise reduction at airports; these studies, along with similar research from Europe, could lead to highway noise reduction. The report examines the relative merits of “low noise” highways and the use of noise barriers.

Metrics: Advances in the ability to collect, store, and analyze noise data challenge us to reexamine metrics that were developed in the 1970s. Purchase information: http://www.nap.edu/catalog.php?record_id=12928

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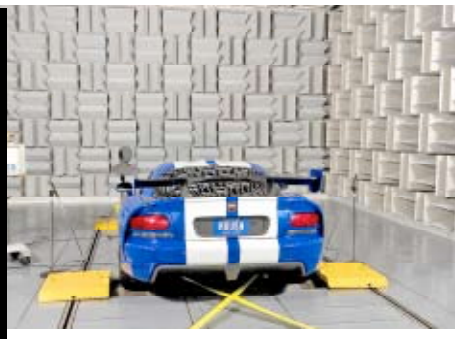

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pinta acoustic Introduces SONEX® AFS Ceiling and Wall System

pinta acoustic, inc., the original manufacturer of SONEX acoustic panels for the broadcast and recording industries, has introduced its new, affordable SONEX AFS Ceiling and Wall System. Flexible and resilient, SONEX AFS acoustic plaster finishing system is said to provide a seamless, monolithic look to walls and ceilings. SONEX AFS is said to offer excellent sound absorption with the highest noise reduction coefficient (NRC) on the market today.

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For information or a sample, visit www.pinta-acoustic.com/afs

LMS International and JSOL Corporation Announce Partnership to Address Noise Generated by Electric Machines

With the combination of LMS Virtual.Lab Acoustics and JMAG, a full solution to perform noise analysis on electrical machines including electro-magnetic caused noise, is now available. Driven by a strong trend to go more green and eco-friendly, electrical machines have gotten a serious boom lately. And while technology improvements in electrical machines have led to more power and also better battery life, the issue of the noise generated by the electrical machines, including motors and generators, keeps development teams looking for better solutions.

One of the aspects of noise generated by electrical machines is related to electro-magnetic noise. The electro-magnetic forces generated make it vibrate and radiate noise. These forces can be predicted accurately by a proper electro-magnetic prediction tool such as JMAG. It simulates the forces on the electro-magnetic mesh (typically a 2D mesh) and in the time domain. LMS Virtual.Lab acoustics has an interface to JMAG where these forces are mapped from time to frequency domain; from 2D to 3D, and are mapped from the Electro-magnetic mesh to the structural mesh. Within Virtual.Lab these forces are then applied to the stator and used for predicting the vibration and unwanted noise, and to reduce or optimize this noise.

Mitsubishi and LMS Develop Procedures That Speed Body NVH Analysis up to a Factor of 100

Mitsubishi Motor Corporation and LMS engineers teamed up to deploy analysis procedures that reduce the time required to simulate the NVH performance of a car body to as little as one-hundredth of the time previously required. Conventional full-body finite element models that are normally used to evaluate body NVH prior take so long to solve that relatively few design alternatives can be considered. The new wave-based substructuring (WBS) and modal projection method reduce the size of the finite element model in order to reduce simulation solution time while providing accuracy that is essentially equivalent to a full finite element model.

Vehicle manufacturers are redesigning existing models and launching new variants at an unprecedented pace. Since the vast majority of these vehicles are built on common platforms, body engineering is nearly always on the critical path of the car development process. Other important design and development issues, such as crash, structural rigidity, and production feasibility, can and usually are addressed early in the development process with computer simulation. But the size and complexity of vehicle body models makes them much more challenging to simulate for NVH performance than other vehicle system and component models. Hundreds of thousands of finite element nodes are typically required to provide accurate simulations of fully trimmed body models. With current high-end computing systems it typically takes on the order of 24 hours to perform a single analysis iteration.

Optimizing body NVH early in the development

The problem is that engineers need to evaluate hundreds of different body design alternatives to optimize body performance from an interior acoustics and comfort standpoint. These simulations typically need to be performed within the space of a few weeks in order to provide information promptly enough to be useful during the early stages of the development process. It isn't possible to perform these simulations that quickly using conventional finite element analysis methods, which means that automotive OEMs today are generally forced to address critical NVH issues late in the development process. The problem with this approach is that relatively little design

flexibility is available at this late stage and most of the available options, such as adding tuned absorbers, are quite expensive. Late-stage troubleshooting also runs the risk of delaying the vehicle introduction.

Wave-based substructuring connects body components

Mitsubishi Motors Corporation worked with consultants from LMS Engineering Services to pioneer new approaches that increase the speed with which body NVH can be simulated while maintaining the accuracy of full finite element models. Wave-based substructuring or WBS is a new method that was developed to assemble the structural model of the full body as a compilation of the reduced FE models of individual parts. The basic idea of the WBS method is to express the deformation of the coupling interface in the form of basis functions called waves. Connections that are normally defined in terms of the interface degrees of freedom (dof) are replaced by connections between waves that impose the continuity of the displacements and forces. Representing the connections by waves, which are analogous to mode shapes, makes it possible to reduce the computational workload by limiting the analysis to only the lower-order waves, which represent nearly all of the potential deformations. The number of interface dofs is reduced from the number of connections to the number of waves, which substantially reduces the computational workload.

A key advantage of the WBS approach is that it enables additional reductions in compute time by replacing components whose modification is not under consideration with modal reduction techniques while maintaining a full finite element model for parts that are subject to modifications. The full body finite element model is first used to generate the set of waves that are then utilized to build a modal reduced model of the components. This provides substantial reductions in computational time with a minimum effect on accuracy.

Wave-based substructuring supports early body NVH optimization

The WBS method is said to be ideal for NVH optimization of body panels that are assembled together with spot welds. The following example shows how Mitsubishi and LMS engineers validated the WBS approach on an existing model vehicle. The cowl top area was identified as an important contributor to booming noise using an earlier full body analysis. The challenge was that trying many alternative cowl top designs using full body finite element analysis would have taken too long to have a positive impact on the design process. So LMS consultants divided the body into two substructures, the cowl top panels and the remainder. Since no design modifications were to be considered outside the cowl top panel, the remainder of the body was simplified using modal reduction. The substructures were connected with spot welds and also with glue at the windshield interface. Nearly 1000 coupling dofs in the original model were replaced by about 250 waves.

A comparison of the vibro-acoustic response of the full finite element and reduced WBS models showed very good correlation. LMS engineers then took advantage of the ability of the WBS model to evaluate new design modifications in a very short time. The actual calculation time using the WBS model was benchmarked as 50 times faster compared to the traditional FE model. They evaluated the effect of adding reinforcement bars and brackets, thickness and material changes, and various combinations of modifications. These modifications were selected through a Weak Spot Detection analysis in which the critical peaks in the response are traced back to their root cause in terms of panel contribution, modal contribution, etc. They identified a modification that combined thickness changes, both increases and decreases, with the addition of reinforcements. It reduced the vibro-acoustic response in the front seat below the design target over the entire frequency range being evaluated. Then they ran a full finite element model of their proposed modifications and verified the accuracy of the WBS predictions.

For more information, contact LMS North America, 1050 Wilshire Blvd., Suite 250, Troy, MI, USA 48084. Phone: 248-952-5664, Fax: 248-952-1610, Email: info@lmsna.com or info@lms.be, Web site: www.lmsintl.com

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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.

2012 August 19–22
INTER-NOISE 12
New York City, USA
Contact:
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Amy Herron, Conference Coordinator
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9100 Purdue Road. Suite 200
Indianapolis, IN 46268-3165
Telephone: +1 317 735 4063
E-mail: ibo@inceusa.org
http://www.internoise2012.com

2013 August 28-30
NOISE-CON 13
Denver, Colorado, USA
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Amy Herron, Conference Coordinator
INCE/USA Business Office
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2013 August 30-September 1
Wind Turbine Noise 2013
Denver, Colorado, USA
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Directory of Noise Control Services

Information on listings in the Directory of Noise Control Services is available from the INCE/USA Business Office, 9100 Purdue Road, Suite 200, Indianapolis, IN 46268-3165. Telephone: +1 317 735 4063: e-mail: ibo@inceusa.org. The price is USD 400 for 4 insertions.

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INTER-NOISE 2012

New York City, USA
August 19–22

INTER-NOISE 2012, the 41st International Congress and Exposition on Noise Control Engineering, will be held in New York City, USA, from 19-22 August 2012. The theme of the Congress is Quieting the World's Cities. The congress is being held in conjunction with the American Society of Mechanical Engineers Noise Control and Acoustics Division (ASME NCAD) annual meeting, is sponsored by the International Institute of Noise Control Engineering (I-INCE), and is being organized by the United States Institute of Noise Control Engineering (INCE-USA). The Acoustical Society of America (ASA) and SAE International are also co-sponsoring the event.

We anticipate a large, broad program of sessions on a variety of acoustics, vibration, and noise topics. We plan to hold special workshops highlighting city noise codes, and the New York City noise code in particular.

The INCE/USA Page at the Atlas Bookstore

www.atlasbooks.com/marktplc/00726.htm

INTER-NOISE 06 Proceedings

This searchable CD-ROM contains the 662 papers presented at INTER-NOISE 06, the 2006 Congress and Exposition on Noise Control Engineering. This, the 35th in a series of international congresses on noise control engineering was held held in Honolulu,Hawaii, USA on December 3-6, 2006. The theme of the congress was "Engineering a Quieter World."

The technical topics covered at INTER-NOISE 06 included:

- Aircraft and Airport Noise Control
- Community Noise
- Fan noise and aeroacoustics
- Highway, automobile and heavy vehicle noise
- Machinery noise
- Noise policy
- Product noise emissions
- Sound quality.

The NOISE-CON 2011 Proceedings Archive (1996-2011)

NOISE-CON 2011 was held jointly with the Transportation Research Board (TRB) ADC40 Committee on Transportation-Related Noise and Vibration on 25-27 July, 2011 at the Marriott Downtown Waterfront Hotel in Portland, Oregon. One hundred forty seven (147) technical presentations were given at the conference and of those, 132 were submitted as written papers that are included on this DVD.

This DVD contains the proceedings of ALL NOISE-CON conferences held since 1996. This includes the years 1996, 1998, 2000, 2001, 2003, 2004, 2005, 2007, 2008, and 2010. Also included are the proceedings of two sound quality symposia, 1998 and 2002. So, including the NOISE-CON 2011 papers, a total of 1621 technical papers are included on this DVD. All papers are in PDF format.

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NOISE-CON 11 DVD

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Written papers were submitted in nine INCE/USA technical areas. Given the fact that the conference was a joint conference with the TRB ADC40 Committee on Transportation-Related Noise and Vibration, there were more papers presented in the INCE Transportation Noise technical area than any other area (37 papers). However, there was also a strong turn-out in other technical areas such as:

- Building Acoustics – 21 papers
- Industrial Noise – 18 papers
- Passive Noise Control – 17 papers
- Structural Acoustics – 13 papers

The remaining twenty six papers were spread out over four of the remaining seven INCE technical areas.

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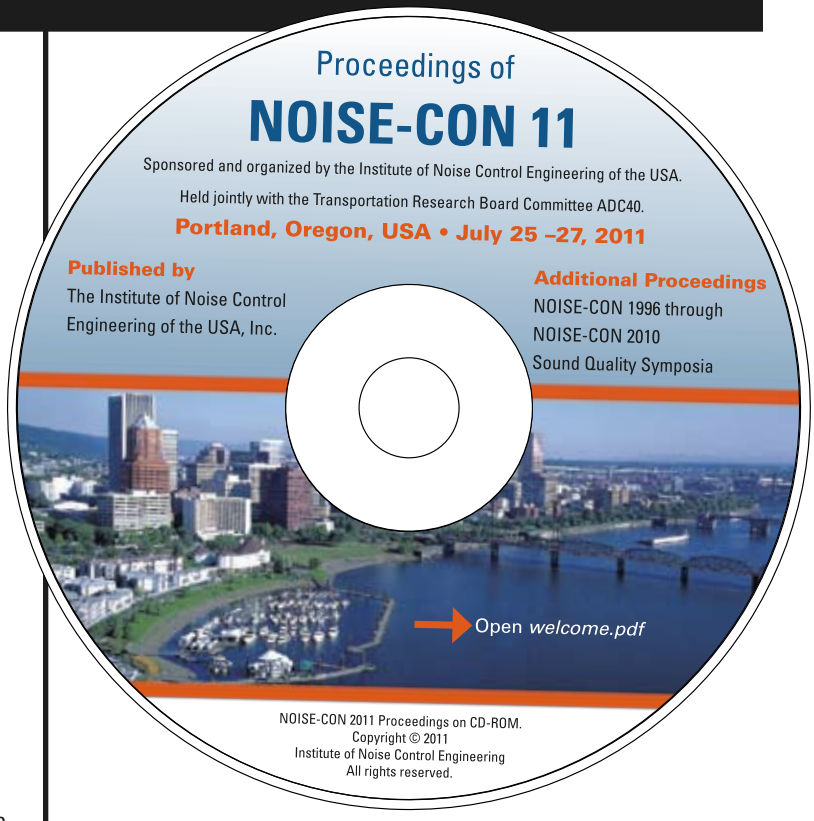
These papers are a valuable source of information on noise control that will be of value to engineers in industry, acoustical consultants, researchers, government workers, and the academic community.



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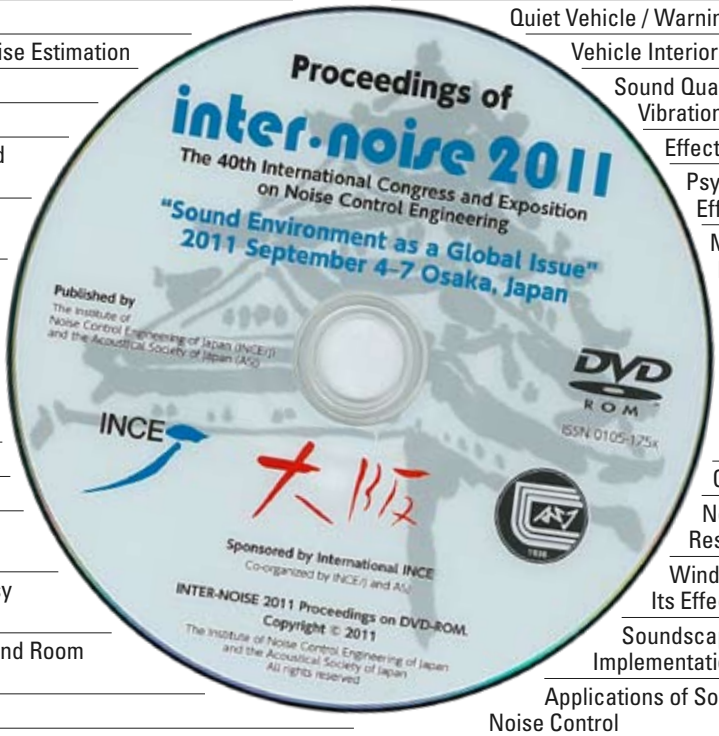

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