VII Symposium on Application of Noise and Vibration in Diagnostics of Machinery

The universally occurring acoustic phenomena which accompany the operation of machinery and technological equipment permit wide applications of acoustic signals in computer science and diagnostics. Application of this potential in practice requires development and sophistication of measurement methods, and particularly seeking qualitatively and quantitatively correct estimation of vibration and noise of given machinery.

These problems were discussed at the VII Symposium on Application of Noise and Vibration in Diagnostics of Machinery. As previous Symposia it was organized by Institute of Motor Transport of Silesian Technical University on January 11-16, 1981 at Wisła-Malinka.

The papers delivered at the Symposium continued the problems discussed at previous conferences. Prof. Dr. Ludwik MÜLLER was the Scientific Chairman of the Symposium. The Symposium was concluded with a panel session chaired by Prof. Dr. Stefan CZARNECKI of Institute of Fundamental Technological Research, Polish Academy of Sciences, Warsaw.

Janusz Gadulski

BOOK REVIEWS

Daryl N. MAY (ed.), *Handbook of noise assessment*, Van Nostrand Company, New York 1978 (391 pages).

An increase of noise in the environment of man makes it necessary to present more closely the effects of noise on man, both from the psychological and physiological points of view. For this reason Van Nostrand Reinhold Environmental Engineering Series published a collective work on the effect of noise on man, featuring chapters by prominent experts and edited by Daryl N. MAY.

The book has two parts. The first concerns the psychological aspects of the effect of noise on man, while the second deals with the health aspects.

The first part is divided into ten chapters:

1. Basic subjective responses to noise – D. N. MAY.

This chapter presents the basis criteria of noise loudness assessment and noise annoyance under the steady-state and transient conditions. It also discusses the effect of noise on the intelligibility of speech.

2. Noise of surface transportation to nontravelers – M. J. CROCKER.

This part presents the main sources of surface transportation, with a division into aircraft and helicopteres at airport, automotive and rail transportation, recreational vehicles such as scooters, motorcycles, motorbicycles, snowmobiles and speedboats. It also presents

the problem of the annoyance of the transportation means ennumerated above, and the criteria for their assessment and measurement methods. It also outlines the basic standards in this field.

3. Noise of air transportation to nontravelers – M. J. Crocker.

The peculiarity of aircraft noise has made it necessary to introduce different criteria of noise annoyance assessment, compared to these for surface transportation discussed in the preceding chapter. It also encloses a list of the basic legislative acts in the USA on the aircraft noise control.

4. Recreational vehicle noise to nonusers – E. Rose.

This chapter presents the problems of the effect on the environment of man of recreational and sports vehicles such as motorcycles, motorbicycles, go-karts, motorboats, snowmobiles and dune buggies.

5. Noise of transportation to travelers – G. Crépeau.

This chapter discusses the effect of noise from transportation means on the crew and passengers. The enclosed tables of noise within different automotive types and the proposed admissible levels can be the basis for improved comfort of passengers and for better working conditions of drivers. The conclusion of this chapter deals briefly with vibration problems.

6. Interior noise environment – L. W. Hegvold, D. N. May.

This section discusses briefly the problem of noise annoyance in apartments and public interiors, gives the admissible levels, and deals with the problems of speech intelligibility in offices.

7. Noise in hospitals – J. G. Walker.

This chapter concerns the problem of the effect of noise on patients and hospital personnel, and discusses briefly the criteria.

8. Exterior industrial and commercial noise – R. Taylor.

This part deals briefly with the problem of division of urban agglomeration into zones, depending on the level of industrial and commercial noise.

9. Construction site noise – R. J. Alfredson, D. N. May.

Beginning with a discussion of the successive building stages from site preparation through foundation laying to interior finish, the authors present the problems of noise in these stages and then go on to discuss the noise from construction machinery and auxiliary equipment.

10. Noise in and around the home – D. N. May.

This chapter deals with the sources of external and internal residential noise, including appliances.

The second part is divided into four chapters:

1. Occupational deafness and hearing conservation – A. M. Martin, J. G. Walker.

A short discussion of the fundamentals of the performance of a hearing aid is followed by presentation of methods of audiometric and dosimetric measurements, and the problem of noise control by setting the admissible noise doses.

2. The nonauditory effects of noise on health – D. Stephens, G. Rood.

This section presents the little investigated effect of noise on the respiratory, central nervous and circulatory systems of man, and discusses the effect of infra- and ultrasound on the particular systems.

3. Noise and sleep: a literature review and a proposed criterion for assessing effect – J. S. Lukas.

This chapter discusses the little known, but very important, effect of noise on human sleep. It gives averaged numerical data on the responses of specific human groups to noise in sleep, with consideration of their sex and age. It also proposes preliminary assessing criteria.

4. Effects of noise on human work efficincy – G. R. J. HOCKEY.

This chapter discusses the problem of the effect of continous and interrupted noise on work efficiency, the problem of localization of a noise source with respect to an observer, and finally the consideration of the future in this respect.

The book concludes with a short appendix containing a list of chosen standards, periodicals and international centres, and a short glossary of most important terms related to the problems discussed. This book is an original, valuable source of information in the field of the effect of noise on man, which in addition to encyclopedic information discusses a number of new aspects with a future bearing.

Stefan Czarnecki

Building acoustics, L'acustica nell'edifizia, ESA Edizioni Scientifiche Associate Roma 1979

Proceedings of a two-day symposium on building acoustics, which was held in Torino on 5-6 June, 1979 (259 pages, in Italian).

The symposium was organized by the Gallileo Ferraris Institute of Electrotechnology and was sponsored by Italian Acoustical Society.

The proceedings consist of sixteen papers by Italian authors and one in French by a French author, and in terms of subject can be divided into two parts.

The first part, which contains the materials from the first day of the symposium, is concerned with the problems of standardization and, in addition to short papers, includes a long monographic review of E. BROSIO on the standardization of measurement methods in building.

The second part, which contains the materials from the second day of the symposium, concentrates on technical aspects. This part includes a large monographic paper of G. FRANZITTA on the insulating properties of barriers. Technical aspects of the insulating properties of different kinds of barrier are examined by R. PISANI and M. CURIONI. The second part also includes a paper of R. ROSSE on different aspects of noise control in residential buildings in France.

The proceedings as a whole testify to high rank of building acoustics in Italy and to the need for further development in fundamental research, technology and standardization.

Stefan Czarnecki

Mario COSA, *Urban and industrial noise, Il rumore urbano e industriale,* Instituto Italiano de Medicina Sociale, Roma 1980 (937 pages, in Italian).

This book contains a large material on the environmental acoustics and concerns the problems of the noise hazard and annoyance to man, and also the technical aspects of industrial and urban noise.

In addition, the book contains an ample list of standards in different countries, a unique presentation of chosen data in the field of the standardization of vibroacoustics and environmental acoustics.

Another interesting material is a large review of the basic definitions of the field discussed.

The book has ten chapters.

Chapter 1 discusses the basic notions in sound and noise and presents the criteria for their subjective assessment.

Chapter 2 concerns the manner of noise perception by the hearing organ and the effects of noise on man. It also discusses the primary kinds of noise-induced hearing loss.

Chapter 3 deals with urban acoustics, namely with methods for measurement and evaluation of transportation noise and includes a broad discussion of corrections for external factors, methods for calculating urban barriers, methods for averaging urban noises in time and standards for admissible noise levels in different countries, particularly those in different districts of Italy.

Chapter 4 deals with noise inside apartment houses both from the viewpoint of the effect of external and internal noise (neighbours, facilities) and discusses methods for measurement and standard for numerical values of insulating power of partitions.

Chapter 5 presents the problems of noise at work stands, including transient noise, and discusses standards in this field in particular countries. It also gives the basic methods for the reduction of noise propagation in industrial interiors and in ventilation channels (mufflers).

Chapter 6 deals with the problems of areadynamic noise and is devoted mainly to aircraft noise and the criteria for their assessment. It also presents the possibilities of aerodynamic noise control.

Chapter 7 is devoted to the problems of ariborne and structure-borne sound in buildings, and gives the values of the absorption by different types of carpeting, and the information of floating floors and suspended ceilings.

Chapter 8 contains 266 basic definitions of technical and medical notions and of generally used abbreviations of most important notions and units. This is a large material of about 100 pages, in which, in addition to definitions, some entries include basic formulae, figures, or tables.

Chapter 9 gives a long list (about 100 pages long) of most important standards in environmental and building acoustics from about 30 countries, including the standards of ISO and IEC. The titles of the standards are given in one of the following languages: Italian, English, French or German.

The standards are divided into fourteen groups:

1. The basic notions, terminology of acoustics and electroacoustics.
2. The criteria for the assessment of noise hazard and annoyance.
3. Noise measurement methods.
4. Measurements of machinery noise.
5. Acoustic measurements in interiors, acoustic and antivibration materials.
6. Measurements of noise from motorcars, railway and ships.
7. Audiometers and hearing aids.
8. Measurements of aricraft noise.
9. The basic vibration standards.
10. The basic criteria for the assessment of vibration hazard and annoyance.
11. Vibration measurements.
12. Measurements of machinery vibration.
13. Vibration measurements in environmential acoustics.
14. Physical properties of materials.

Chapter 10 is a short appendix which gives the most important data and the current proposals in standardization.

This book as a whole is a large source of information on environmental acoustics and a valuable aid to engineers, physicians and others related to the problems.

Additional advantages of this book are a large number of tables (over 80) and figures (also over 80), and a very long list of references, of nearly 900 items.

Stefan Czarnecki