

CURRICULUM VITAE

ROBERT D. BRUCE - PRINCIPAL CONSULTANT

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Birth Date: 13 January 1941

Birth Place: Livingston, TX

Citizenship: U.S.

PROFESSIONAL REGISTRATIONS

P.E., State of Texas #76351
INCE.Bd.Cert.

EDUCATION

Lamar State College of Technology, B.S., Elec. Eng., 1963
Massachusetts Institute of Technology, S.M., Elec. Eng., 1966
Massachusetts Institute of Technology, E.E., Engineer's Degree in
Electrical Engineering, 1966

PROFESSIONAL EXPERIENCE

Mobil Oil Company, 1963-1964
Massachusetts Institute of Technology (MIT), 1964-1966
Bolt Beranek and Newman Inc. (BBN), 1966-1981
Hoover Keith & Bruce Inc., 1981-1987
Collaboration in Science and Technology Inc., 1987-Present
Lecturer:

Cape Cod Course on Noise and Vibration Control, September 1970
MIT Summer Course "Noise and Vibration Control," 1972 and 1975
Industrial Hearing and Testing Lecture Series, Emerson College,
1973-1981
University of Michigan, 1977

Guest Lecturer:

Northeastern University Center for Continuing Education, 1971
National Academy of Sciences Acoustical Society Lecture Series, 1971
MIT Special Summer Program in Urban Studies, 1971
The University of Texas Health Science Center at Houston, 1981-1991

HONORS AND SOCIETIES

National Academy of Engineering:

Member of Steering Committee for "Technology for a Quieter America"

Fellow:

Acoustical Society of America (ASA)

1986 President:

Institute of Noise Control Engineering (INCE)

Associate Editor:

Noise Control Engineering Journal, 1994 to 1998

Representative of INCE to:

Council for Accreditation in Occupational Hearing Conservation (CAOHC)

Acoustical Society of America

Member of the Technical Committee on Noise

Member:

American Industrial Hygiene Association, National Association of Railroad Safety Consultants and Investigators

Listed in:

Dictionary of International Biography, International Biographical Center; Notable Americans, 1978-1979; Community Leaders of America, 1979-1980; Men of Achievement, 1979-1980; Men and Women of Distinction, 1980; WHO'S WHO IN THE EAST, 17th Ed.; WHO'S WHO IN FINANCE AND INDUSTRY, 22nd Ed.; WHO'S WHO IN THE WORLD, 1982; WHO'S WHO IN U.S. EXECUTIVES, 1989; WHO'S WHO IN THE SAFETY PROFESSION, 1990; and WHO'S WHO IN SCIENCE AND ENGINEERING, 1991.

Past Member:

Air Pollution Control Association; American Management Association; ASA, Technical Committee on Noise; ASA, Medals and Awards Committee; Blue Key; Eta Kappa Nu; INCE, Board of Directors; INCE, Board of Examiners; INCE, Technical Advisory Group on Industrial Machines and Processes; MIT Enterprise Forum of Texas, Board of Directors; New York Academy of Science; Phi Kappa Phi; Society of Automotive Engineering; and Tau Beta Pi.

Past Chairman:

ASA, Boston Chapter

ASA, Houston Chapter

ASA, Technical Committee on Noise

INCE, Technical Advisory Group on Industrial Machines and Processes

PROFESSIONAL RESPONSIBILITIES AND PROJECTS

At Collaboration in Science and Technology Inc. (CSTI), Mr. Bruce specializes in the solution of acoustical problems. For industry, he has investigated occupational noise exposures, hearing loss, structural fatigue, and community noise and vibration problems. He has also used acoustical techniques to improve the process flow in a ballmill. Mr. Bruce has consulted on problems in the following industries: food, textile, lumber, chemical, plastics, oil and gas, rubber, steel, aluminum, fabricated metals, mining, machinery, automobile, ship, aircraft, cogeneration, and power. In addition, he has analyzed noise and vibration problems related to aircraft (commercial, military, and helicopters), airports, missiles, highways (automobiles, motorcycles, buses, trucks, and emergency vehicles), rapid transit systems, railroads, racing cars, and hovercraft. Mr. Bruce has designed acoustical treatments for concert halls, office buildings, university buildings, shopping malls, recreational centers, hospitals, and churches. Mr. Bruce has worked on projects throughout the U.S. including Hawaii, the North Slope of Alaska, the Gulf of Mexico, and abroad in Canada, Trinidad, Brazil, England, Scotland, the North Sea, Germany, Qatar, and Nigeria. For over 30 years and on thousands of projects, Mr. Bruce has shared with clients his knowledge of acoustical measurements, industrial noise control, product noise control, vibration, environmental noise control, and building acoustics. He has written chapters on measurements and control techniques for sound and vibration in 12 books and has published over 50 technical papers related to building acoustics, environmental noise, and industrial noise and vibration.

CHAPTERS IN BOOKS

"Field Measurements - Equipment and Techniques," Chapter 4, Noise and Vibration Control, L.L. Beranek (ed.), McGraw-Hill Book Co., Inc., New York, NY, 1971.

"Industrial Noise - Effects and Control," Section 3, Dangerous Properties of Industrial Materials, N. Irving Sax (ed.), Van Nostrand Reinhold Co., New York, NY, 1975, 5th ed., 1979.

"Reduction of Noise at the Source," and "The Economic Impact of Noise Control," chapters in The Otolaryngologic Clinics of North America: Symposium on Noise - Its Effects and Control, Vol. 12, No. 3, W.B. Saunders Co., Philadelphia, PA, August 1979, p. 563.

"Noise Pollution," Chapter 36, Community Health Nursing: Keeping the Public Healthy, Linda Jarvis (ed.), F.A. Davis Company, Philadelphia, PA, 1st ed., 1981 and 2nd ed., 1985.

"Noise Pollution," section in Kirk-Othmer: Encyclopedia of Chemical Technology, Vol. 16, 3rd ed., John Wiley & Sons, Inc., New York, NY, 1981.

A House Call from Space, Booklet for Children of Parents With End Stage Renal Disease, with R. Smith, A.S. Bommer, and L.M. Bruce, 1986.

"Engineering Controls," Chapter 12, Industrial Noise & Hearing Conservation Manual, with E. Toothman, Elliott Berger (ed.) & other editors, American Industrial Hygiene Association, Cleveland, OH, 4th ed., 1986 and 1988.

"Powerplant Noise and its Control," Chapter 4.1, Standard Handbook of Powerplant Engineering, with R. M. Hoover, Thomas C. Elliott (ed.) & editors of Power Magazine, McGraw-Hill Book Co., New York, NY, 1989.

"Sound Power Level Predictions for Industrial Machinery," Chapter 86, Encyclopedia of Acoustics, with Charles T. Moritz, Malcolm Crocker (ed.), John Wiley & Sons, Inc., New York, NY, 1997.

"Noise, Vibration, and Ultrasound," Chapter 20, The Occupational Environment: Its Evaluation and Control, with Arno S. Bommer and Charles T. Moritz, Salvatore R. DiNardi (ed.), AIHA, Fairfax, VA, 1997.

"Sound Power Level Predictions for Industrial Machinery," Chapter, Acoustics Handbook, with Charles T. Moritz, Malcolm Crocker (ed.), John Wiley & Sons, Inc., New York, NY, 1998.

"Noise, Vibration, and Ultrasound," Chapter 20, The Occupational Environment: Its Evaluation and Control 2nd Edition, with Arno S. Bommer and Charles T. Moritz, Salvatore R. DiNardi (ed.), AIHA, Fairfax, VA, 2003.

"Sound Power Level Predictions for Industrial Machinery," Chapter, Handbook of Noise and Vibration, with Arno Bommer and Charles T. Moritz, Malcolm Crocker (ed.), John Wiley & Sons, Inc., New York, NY, 2005.

OTHER PUBLICATIONS

"Development of Speech Acoustics Criteria Using an Auditorium Acoustics Simulator," with B.G. Watters, paper, 79th ASA Meeting, 1970.

"Measurement of Noise," IEEE Transactions on Geoscience, 1970, GE-8: 130-138.

"Noise Control for HVAC Systems," Lecture notes for Cape Cod Course "Noise and Vibration Control," copyrighted by BBN, September 1970.

"Noise Control for Punch Presses," Metal Stamping 4(10):10-13, October 1970.

"Noise in Stamping: Measures to Prevent Hearing Damage," Stamping/Diemaking, November-December 1970.

"Punch Press Noise Control," Lecture notes for Cape Cod Course "Noise and Vibration Control," copyrighted by BBN, September 1970.

"Noise Control in the Rubber and Plastics Industries," with J.R. Shadley, IEEE Conference Records 1971, Twenty-third Annual Conference of Electrical Engineering Problems in the Rubber and Plastics Industries, Paper RP 71-2, Akron, OH, April 5-7, 1971.

"Noise Control in Manufacturing Plants," 1971 International Tool Exposition and Engineering Conference, 28 April 1971, Philadelphia, PA, Technical Paper MM71-206, Society of Manufacturing Engineers, 20501 Ford Road, Dearborn, MI.

"Noise Control for a Textile Machine," with N.F. Gubitose, Sound and Vibration, Vol. 5, No. 5, May 1971, pp. 20-24.

"Noise and Its Control in the Pulp and Paper Industry," Engineering Conference Proceedings of the Technical Association of the Pulp and Paper Industry, November 1971.

"Industrial Noise Control Treatments," with J.R. Shadley, IEEE Conference Record of the Industry and General Applications Group, October 1971.

"Noise Control for Metal Stamping Operations," Sound and Vibration, Vol. 5, No. 11, November 1971, pp. 41-45.

"The Noise of Spring Manufacturing - Measures to Prevent Hearing Damage," Springs, Vol. 10, No. 2, October 1971, pp. 15-21.

"Controlling Noise in Industrial Plants," 2nd Annual Pollution Engineering and Equipment Exposition and Conference, Chicago, IL, May 1972.

"A Review of Noise and Vibration Control for Impact Machines," Inter-Noise 1972 Proceedings, Washington, D.C., October 1971.

"Noise and Noise Levels Affecting the Human Sensory System," Text of a talk delivered at the International Pollution Engineering Exposition and Congress, Cleveland, OH, December 1972.

"Community and In-Plant Noise Levels in the Process Industry," with R.E. Werchan, Paper No. 45c, The Seventy-fourth National Meeting of the American Institute of Chemical Engineers, New Orleans, LA, 13 March 1973.

"Approach to Noise Control in New Facilities," with C.H. Allen, Noise-Con 1973 Proceedings, Washington, D.C., 15-17 October 1973.

"Noise Control: Process Plant Noise can be Controlled," with R.E. Werchan, Chemical Engineering Progress, Vol. 69, No. 10, March 1973, pp. 51-55.

"The Costs and Benefits of Implementing 90 and 85 dB(A) Noise Exposure Standards," Proceedings of International Congress on Man and Noise, Turin, Italy, June 1975.

"Workplace Noise Exposure Control—What Are the Costs and Benefits?" with Paul Jensen, Charles R. Jokel, Richard H. Bolt, James A. Kane, and Steven Swanson, Sound and Vibration, Vol. 10, No. 9, September 1976, pp.12-18.

"The Cost to Industry of Noise Control to Protect Employees' Hearing," Noise Control Engineering, Vol. 12, No. 2, March-April 1979.

Book Review for "Reference Data for Acoustic Noise Control," J. Acoust. Soc. Am., Vol. 65, No. 3, March 1979, p. 866.

"Improving Education for Noise Control Engineers," Inter-Noise 80 Proceedings, Miami, FL, December 1980.

Book Review for "Proceedings Inter-Noise 79," Noise Control Engineering, March-April 1981, pp. 73-74.

"The Functions and Responsibilities of an Acoustical Consultant in Industrial Noise Control," with Laymon N. Miller, NOISEXPO, Chicago, IL, April 1981.

"The Coming Opportunity for Noise Control at the Source in the Metal Fabrication Industry," Noise-Con '81 Proceedings, Raleigh, NC, June 1981.

"Electric Motor Noise Control Over the Past Ten Years," with J. D. Barnes Inter-Noise 82 Proceedings, San Francisco, CA, May 1982.

"Noise Control for a Flare Near a Community," in Noise & Pollution Control in Refinery/Petrochemical Plants, Proceedings of 38th ASME Petrochemical Mechanical Engineering Workshop and Conference, Philadelphia, PA, September 1982.

"Costs and Benefits of Occupational Noise Control Through the Use of Retrofit Noise Control Treatments Versus Quieter Designed Equipment," Inter-Noise '84 Proceeding, Honolulu, USA, December 1984.

"Environmental Noise Control for Industrial Facilities," ASCE Meeting, Denver, CO, May-1-2, 1985.

"Generation of Squeal Tones in Vertical Honing Machines," with H. L. Kuntz, Inter-Noise 1985 Proceedings, Munich, Germany, September 1985.

"Long-Term Ambient Sound Monitoring in National Parks," Sound and Vibration, with A. S. Bommer, February 1992, pp. 16-18.

"An Acoustical Study of A Large Rotunda," J. Acoust. Soc. Am., with C. T. Moritz, Vol. 92, No. 4, Pt. 2, October 1992, p. 2470.

"Special Concerns of Noise Control on Offshore Platforms," J. Acoust. Soc. Am., with A. S. Bommer, Vol. 92, No. 4, Pt. 2, October 1992, p. 2381.

"Improving Education for Future Consultants in Noise Control Engineering," Sound and Vibration, with G. T. Lepley IV, Vol. 27, No. 10, October 1993, pp. 27-29.

"Flare Noise Damage Potential," with C. T. Moritz, presented to the Acoustical Society of America 126th Meeting, Denver, Co, October 1993.

"Cogeneration Plant Noise Analysis and Control," with A. S. Bommer and G.R. Hepler, presented at the Power-Gen Americas '93, Dallas, TX, November 1993.

"Noise Criteria for Ships and Offshore Platforms," with E. V. McKinney, presented to Noise-Con 94, Ft. Lauderdale, FL, May 1994.

"A Brief History of Hearing Protection in the United States," with C. T. Moritz, presented to the Acoustical Society of America 127th Meeting, Cambridge, Ma, June 1994.

"Progress in Controlling Noise in the Workplace," Inter-Noise 95, 1995 Proceedings, Newport Beach, CA, USA, Jul 10-12, 1995.

"The Current Level of Understanding into the Impacts of Energy Industry Noise on Wildlife and Domestic Animals," The 1996 Conference on Environment al Noise Control Engineering, 14-16 April, 1996, p 1-21.

"Noise Control for a 11,000 KW Compressor System," Noise-Con 96, with C. T. Moritz, Seattle, Washington, September 1996.

"Noise Control for a 230 MW Cogeneration Plant," Noise-Con 97, with C. T. Moritz, R. Bicknell, and J. Jacobson, University Park, PA, June 1997.

"The last 100 years of magazine articles on noise," Collected Papers of the 137th meeting of the Acoustical Society of America and the 2nd convention of the European Acoustics Association: Forum Acusticum, Compact Disc, March 14-19,1999, Berlin.

"National Noise Policy on Occupational Health in the U.S.A—National Industrial-Noise-Control Partnerships," with Eric W. Wood. Inter-Noise 2002, Proceedings, Dearborn, MI, USA. 19-21 August 2002.

"The USA needs a new national policy for occupational noise," with E. W. Wood, *Noise Control Eng. J.* **51** (3) p 143-146, 2003 May-Jun.

"Occupational Noise in the USA," Proceedings of Inter-Noise 2004, Prague, Czech Republic, 22-25 August 2004.

"The Occupational Noise Book," with Arno S. Bommer, NIOSH, (in review) 2004.

"It's Time to Buy Quiet," Update, The Newsletter of the Council for Accreditation in Occupational Hearing Conservation, **18** (3), Fall 2006.

"If OSHA Won't Lead, Perhaps They Should Follow," Invited presentation at the Noise Policy Workshop "Implementation and Enforcement of Noise Control Policies" at Inter-Noise 2006, Honolulu, HI, 2006.

"Occupational Noise Dilemma in the USA," Forum on Occupational Noise Management, Lille, France, July 2007.

"Engineering Controls for Reducing Workplace Noise," The Bridge, National Academy of Engineering, Volume 37, Number 3, Fall 2007.

"The presence of infrasound in our everyday life," with Lefkowitz and Bommer, The Journal of the Acoustical Society of America 144(4):259 Oct 2008.

"A New Approach to Noise Control in the Workplace," with Bommer, Lefkowitz, and Levesque, Inter-Noise 2009, Ottawa, ON, CA, Aug. 2009.

"Ultrasound in the Home and Workplace," with Lefkowitz and Bommer, Inter-Noise 2009, Ottawa, ON, CA, Aug. 2009.

"Making shop noise tests under difficult circumstances," with Bommer, Inter-Noise 2009, Ottawa, ON, CA, Aug. 2009.

"Safe Lifetime Occupational Exposure-1 LONE (lifetime occupational noise exposure)," with Arno S. Bommer, Kimberly A. Lefkowitz, and Noel W. Hart, Noise-Con 2010.

"Safe Lifetime Occupational Exposure-1 LONE (lifetime occupational noise exposure)," with Arno S. Bommer, Kimberly A. Lefkowitz, and Noel W. Hart, J. Acoust. Soc. Am., vol. 127, no. 3, pt. 2, March 2010.

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