

Exponent®
Engineering & Scientific Consulting

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Professional Profile

Dr. Johnson specializes in electrically related issues particularly as they relate to the electrical environment of power systems. He has extensive experience with the electric and magnetic fields of transmission and distribution systems as well as the audible noise, radio noise, and ozone that may be produced by high voltage power systems.

Dr. Johnson's work has involved the measurement, modeling, and mitigation of the electrical environment of transmission lines, transformer vaults, and underground/submarine cables. His power system experience includes issues dealing with lightning, electrical transients, ground currents, and stray voltage.

Dr. Johnson has testified on the corona and field effects of DC and AC transmission lines and been a lecturer at the EPRI Transmission Line Design Seminars. He has given numerous presentations and led several workshops on power line design and the electrical environment. He was a principal investigator in the EPRI research on magnetic field sources and methods of shielding.

Dr. Johnson has performed engineering studies related to power system fields, audible noise, radio noise, induced currents, and ground currents for clients including state and federal agencies, utilities, and site developers. Other areas of expertise include investigations of electrically-related fires in devices ranging from consumer appliances to industrial equipment, electrical injury, electrical faults, electronic component failure, code compliance, and facility wiring systems. Prior to joining Exponent, Dr. Johnson was the President of Power Research Engineering, where he worked on engineering issues related to the electrical environment and power quality.

Academic Credentials & Professional Honors

Ph.D., Electrical Engineering, University of Illinois, Urbana-Champaign, 1979

M.S., Physics, University of Illinois, Urbana-Champaign, 1976

B.S., Engineering Physics, University of Illinois, Urbana-Champaign, 1974

Tau Beta Pi

Phi Kappa Phi

Professional Affiliations

Institute of Electrical and Electronic Engineers

American Association for the Advancement of Science

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American Physical Society

BioElectroMagnetics Society

Publications

Johnson GB, Cotts B, Bishop J. Electric Environment of New Overhead HVDC Transmission Lines in North America. EPRI High Voltage Direct Current & Flexible Alternating Current Transmission Systems Conference, Palo Alto, CA, August 10-11, 2017.

Bishop J, Johnson G, Nilsson S, McNichol J. Performance of DC transmission line insulator strings. CIGRE Colloquium on HVDC and Power Electronic Systems Including Overhead Line and Insulated Cable Applications, San Francisco, CA, March 7-9, 2012.

Johnson G. Electrical environment: Conversion of an AC to a DC transmission line. CIGRE Colloquium on HVDC and Power Electronic Systems Including Overhead Line and Insulated Cable Applications, San Francisco, CA, March 7-9, 2012.

Bailey WH, Johnson GB, Bishop J, Hetrick T, Su S. Measurements of charged aerosols near ±500 kV DC transmission lines and in other environments. IEEE Transactions on Power Delivery 2012; 27:371-379.

Martens J, Johnson GB, So P. Design considerations for consumer products utilizing high voltage. Presentation and Conference Proceedings, IEEE Symposium on Product Safety & Compliance Engineering, IEEE Product Safety Engineering Society, Irvine, CA, October 23-24, 2006.

Bailey WH, Johnson GB, Bracken TD. Method for measuring charge on aerosol particles near AC transmission lines. Joint Meeting of the Biolectromagnetics Society and the European BioElectromagnetics Association, Dublin, Ireland, June 2005.

Johnson GB, Bracken TD, Bailey W. Charging and Transport of Aerosols near AC Transmission Lines: A Literature Review, EPRI, Palo Alto, CA, and National Grid Transco Plc., London, England: 2003. EPRI Report 1008148, Palo Alto, CA, December 2003.

Johnson GB, Guttman JL, Kavet R. Transient magnetic fields and currents in residences. Proceedings, IEEE International Symposium on Electromagnetic Compatibility, Montreal, Canada, August 2001; Vol 1: 227-232.

Guttman JL, Niple J, Kavet R, Johnson GB. Measurement instrumentation for transient magnetic fields and currents. Proceedings, IEEE International Symposium on Electromagnetic Compatibility, Montreal, Canada, August 2001; Vol 1: 419-424.

Kavet R, Ulrich RM, Kaune WT, Johnson GB, Powers T. Determinants of power-frequency magnetic fields in residences located away from overhead power lines. Bioelectromagnetics 1999; 20(5):306-318.

Johnson GB. Instrumentation and measurement technology. Proceedings, EMF Engineering Review Symposium, EMF-RAPID Program, Charleston, SC, April 1998.

Johnson GB. Field-management technologies. Proceedings, EMF Engineering Review Symposium, EMF-RAPID Program, Charleston, SC, April 1998.

Johnson GB, Kavet R, Sastre A. Residential magnetic field transients. Effect of residential services on fields arising from distribution line capacitor bank switching. Bioelectromagnetics Symposium, P-130A, Salt Lake City, UT, June 1995.

Johnson GB, Clairmont BA. Low field transmission lines: Design concepts. Proceedings, 1995 CIGRE

Study Committee 36 Colloquium, Foz do Aquacu, Brazil, May 1995.

Clairmont BA, Johnson GB, Zelingher S. Study on the human perception of hybrid fields. Proceedings, 1995 CIGRE Study Committee 36 Colloquium, Foz do Aquacu, Brazil, May 1995.

Johnson GB. HVDC transmission line corona performance and conductor contamination by insects. Proceedings, 1995 CIGRE Study Committee 36 Colloquium, Foz do Aquacu, Brazil, May 1995.

Johnson GB. Residential magnetic field sources. Proceedings, 1995 EPRI EMF Seminar, Santa Clara, CA, March 1995.

Johnson GB. Residential ground current reduction. Proceedings, 1995 EPRI EMF Seminar, Santa Clara, CA, March 1995.

Johnson GB. Residential field sources: EPRI EMF survey. Proceedings, Pennsylvania Electric Association Transmission and Distribution Meeting, Metamoras, PA, May 12, 1994.

Johnson GB, Lordan RJ. EPRI magnetic field technical information center. Proceedings, American Power Conference, Chicago, IL, April 26, 1994.

Johnson GB, Childs DJ, Sullivan TP. WAVECAM: A pocket size magnetic field waveform capture device. Proceedings, American Power Conference, Chicago, IL, April 26, 1994.

Johnson GB. Magnetic field sources in residences: Measurement, detection, and options. EMF Management Techniques Training Session, 1994 IEEE/PES Transmission and Distribution Conference and Exposition, Chicago, IL, April 14, 1994.

Johnson GB, Lordan R, Clairmont B, King K, Rashkes V. Magnetic field management for transmission lines. Proceedings, 1994 Missouri Valley Electric Association Engineering Conference, Kansas City, MO, March 23, 1994.

Johnson GB. Residential field sources at power frequencies. Proceedings, 1993 IEEE International Symposium on Electromagnetic Compatibility, pp. 132-137, Dallas, TX, August 1993.

Johnson GB, Dunlap JH, Zaffanella LE. Survey of residential magnetic field sources: Interim report. Proceedings, 1993 American Power Conference, pp. 1669-1673, Chicago, IL, April 1993.

Johnson GB. Measurements of magnetic field sources in schools. Proceedings, American Power Conference, Chicago, IL, April 1992.

Johnson GB, Clairmont B, Dunlap J. Transmission line magnetic fields: Measurements and calculations. Proceedings, American Power Conference, Chicago, IL, April 1992.

Johnson GB. Magnetic field sources in nonresidential settings. Proceedings, EPRI Science and Communication Seminar, San Jose, CA, October 1991.

Johnson GB. Magnetic field management: Residential low-voltage grounding. Proceedings, EPRI Science and Communication Seminar, San Jose, CA, October 1991.

Rauch GB, Johnson GB, Johnson P, Stamm A, Tomita S, Swanson J. A comparison of international grounding practices and associated magnetic fields. Proceedings, IEEE T&D Conference, Dallas, TX, September 1991, and IEEE Transaction on Power Delivery 1992; 7:934-939.

Johnson GB, Zaffanella LE, Rauch GB. Research facility for the study of power system magnetic fields. Proceedings, IEEE T&D Conference, Dallas, TX, September 1991.

Johnson GB. Residential magnetic field sources. Panel Session Paper at the IEEE Power Engineering Society Summer Meeting, Minneapolis, MN, July 1990, and IEEE Power Engineering Society Transmission and Distribution Conference, Dallas, TX, September 1991.

Johnson GB, Baishiki RS, Bracken TD, Rauch GB, Silva JM, Sussman SS, Zaffanella LE. Studies of power system magnetic fields: Characterization of sources in residential environments, measurements of exposure, influence on computer screens. Proceedings, CIGRE General Conference, Paris, August 1990.

Johnson GB. Degree of corona saturation for HVDC transmission lines. IEEE Trans Power Delivery 1990; PWRD-5:695-707.

Clairmont BA, Johnson GB, Zaffanella LE, Zelingher S. The effect of HVAC - HVDC line separation in a hybrid corridor. IEEE Trans Power Delivery 1990; PWRD-4(2):1338-1350.

Clairmont BA, Johnson GB. Measurements of AC and DC field and corona effects in a hybrid corridor. Proceedings, American Power Conference, Chicago, IL, April 24-26, 1989.

Johnson GB, Carter PJ. Measurement of space charge density using a Faraday cage. Proceedings, 6th International Symposium on High Voltage Engineering, Paper 42.32, New Orleans, LA, August 1989.

Carter PJ, Johnson GB. Space charge measurements downwind from a monopolar 500 KV HVDC test line. IEEE Trans Power Delivery 1988; PWRD-3(4):2056-2063.

Johnson GB. Electric field and ion density in proximity of HVDC transmission lines: Measurements and calculations. CIGRE Study Committee Montreal Colloquium, Montreal, Canada, June 1987.

Johnson GB, Bracken TD. Small air ion environments. In: Air Ions: Physical and Biological Aspects, CRC Press, 1987.

Johnson GB. Electric fields and ion currents of a +/- 400 kV HVDC test line. IEEE Trans Power Apparatus and Systems, PAS-102, 1983.

Johnson GB, Zaffanella LE. Techniques for measurements of the electrical environment created by HVDC transmission lines. Proceedings, 4th International Symposium on High Voltage Engineering, Paper 13.05, Athens, Greece, September 1983.

Comber MG, Johnson GB. HVDC field and ion effects at Project UHV: Results of electric field and ion current measurements. IEEE Trans Power Apparatus and Systems, PAS-101, 1982.

Johnson GB. The electrical environment and HVDC transmission lines. Proceedings, American Institute of Medical Climatology Conference on Environmental Ions and Related Biological Effects, Philadelphia, PA, October 1982.

Johnson GB, Verdeyen JT, Kaye RJ. Extraction of an intense neutralized ion beam from a plasma. Proceedings, 2nd International Conference on Electron Beam Research and Technology, Ithaca, NY, October 1977.

Johnson GB, Johnson WL, Kaye RJ, Verdeyen JT. Ion beam pellet fusion. Proceedings, 4th Inter-University Conference on Energy, Urbana, IL, April 1977.

Johnson WL, Johnson GB, Verdeyen JT. Ion bunching in electronic space charge regions. J Appl Phys 1976; 47:4442.

Workshops/Seminars

Johnson GB. Proposed IEEE standard - 1556: Public impacts. Panel Session: Electric and Magnetic Field Exposure Standards for the Public and Workers: 0 - 3 kHz, IEEE Power Engineering Society Summer Meeting, Vancouver, Canada, 2001.

Johnson GB. Power system magnetic fields. GPU Workshop, EPRI Power Delivery Center-Lenox, MA 1997.

Johnson GB. Measurement of residential magnetic fields. Yankee Conference, Massachusetts Environmental Health Association, Westborough, MA, 1995.

Johnson GB. Residential sources and exposure. EMF Health Research: State of the Science, Harvard School of Public Health, Boston, MA, 1995.

Johnson GB. Power system magnetic field management seminar. HVTRC, Lenox, MA, 1994.

Johnson GB. EMF in substations. IEEE Workshop, Los Angeles, CA, May 1994.

Johnson GB. Proceedings, Substation Magnetic Field Workshop. EPRI Workshop, Palo Alto, CA, EPRI Report on RP 2942-41, TR 101852, April 1993.

Johnson GB. Distribution magnetic field management workshop. HVTRC, Lenox, MA, 1992; Washington DC, 1993.

Johnson GB. End use magnetic field R&D workshop. EPRI Workshop, Raleigh, NC, 1992.

Johnson GB, Frazier M, Dunlap J. EPRI Electrical Potpourri Seminar, Palo Alto, CA, 1990; Haslet, TX, 1991.

Johnson GB. Magnetic field considerations: Low voltage grounding. EPRI Workshop, Colorado Springs, CO, 1991.

Johnson GB. Power system magnetic field measurement workshop. HVTRC, Lenox, MA, 1988 to 1995.

Johnson GB, Zaffanella L, Comber M, Nigbor R, Clairmont B, Anzivino L, Slocik J. EPRI High Voltage Transmission Line Design Seminar, HVTRC, Lenox, MA, 1982 to 1992.