

ANDREW W. LORD
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December 4, 2012

VIA HAND DELIVERY

Ms. Linda Roberts
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: Docket No. 431: South Norwalk Electric and Water Application for a
Certificate of Environmental Compatibility and Public Need

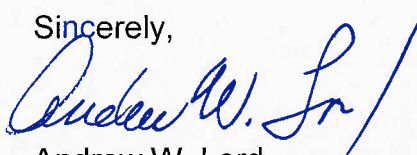
Dear Ms. Roberts:

I am writing on behalf of South Norwalk Electric and Water to provide you with
fifteen (15) copies of:

1. List of Witnesses and Exhibits
2. Pre-filed Testimony of Scott Whitter; James Berg; Manrico Federico;
Douglas Bell and Peter Valberg.

If you have any questions or require additional information, please feel free to
contact me.

Sincerely,



Andrew W. Lord

Enclosures

cc: Service List

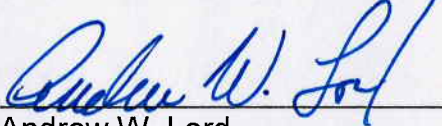
- A. Application to the Connecticut Siting Council for an Application for a Certificate of Environmental Compatibility and Public Need for the SONO substation, Norwalk, Connecticut, September 11, 2012, including attachments and the following bulk-filed exhibits.
- i. Municipal consultation filing;
 - ii. City of Norwalk Plan of Conservation and Development;
 - iii. Norwalk's Inland Wetlands and Watercourse Regulations;
 - iv. Building Zone Regulations of the City of Norwalk.
- B. SNEW responses to the Council's interrogatories, dated November 27, 2012.
- C. Pre-filed testimony of:

Scott Whittier
James Berg
Manrico Federico
Douglas Bell
Peter Valberg

Respectfully submitted,

SOUTH NORWALK ELECTRIC AND WATER

By:


Andrew W. Lord

Murtha Cullina LLP
CityPlace I, 29th Floor
185 Asylum Street
Hartford, CT 06103
Telephone: (860) 240-6180
Facsimile: (860) 240-6150
Its Attorney

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

SOUTH NORWALK ELECTRIC AND WATER : DOCKET NO. 431
APPLICATION FOR A CERTIFICATE OF :
ENVIRONMENTAL COMPATIBILITY AND :
PUBLIC NEED FOR THE CONSTRUCTION, :
MAINTENANCE AND OPERATION OF AN :
ELECTRICAL SUBSTATION AND ITS :
CONNECTION TO AN EXISTING 115 KV :
TRANSMISSION LINE, LOCATED AT 180 DR. :
MARTIN LUTHER KING, JR. DRIVE, :
NORWALK, CONNECTICUT : DECEMBER 4, 2012

PRE-FILED TESTIMONY OF SCOTT WHITTIER

Q. Please state your name, title and business address.

A. Scott Whittier
Director of Technical Services
South Norwalk Electric and Water
164 Water Street
Norwalk, CT 06854

Q. Please describe your current responsibilities and professional expertise.

A. As the Director of Technical Services at South Norwalk Electric and Water, I manage the development of various infrastructure improvements, including a \$29 million ultra-membrane filtration plant for our water treatment facility and am also serving as the Project Manager for the proposed South Norwalk substation.

Q. What has been your role in the South Norwalk Electric and Water's proposed substation that is the subject of this docket?

A. I have served as the Project Manager for the proposed South Norwalk substation. I have been involved in negotiations and discussions with various state and local agencies and organizations regarding all aspects of the project. In addition, I have coordinated with Connecticut Light & Power regarding the interconnection to the local transmission system. As the Project Manager, I oversaw the pre-application municipal review process, the preparation of the Application for a Certificate of Environmental Compatibility and Public Need and the responses to the Siting Council's interrogatories.

Q. Are you prepared to address those sections of the Application and the interrogatories that you prepared or assisted in preparing?

A. Yes.

Q. At this time, are there any additions or corrections to the materials that you prepared?

A. No.

Q. Is the information in the Application and Interrogatory Responses that you prepared or assisted in preparing true and accurate to the best of your knowledge and belief?

A. Yes.

Q. Does this conclude your testimony?

A. Yes

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

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NORWALK, CONNECTICUT : DECEMBER 4, 2012

PRE-FILED TESTIMONY OF JAMES BERG

Q. Please state your name, title and business address.

A. James Berg
AECOM Environment
500 Enterprise Drive, Suite 1A
Rocky Hill, CT 06067

Q. Please describe your current responsibilities and professional expertise.

A. I am a Project Engineer for AECOM, a world-wide engineering and environmental consulting company. AECOM provides a wide array of services to many industrial sectors, including electric generation and transmission. I have twelve years of experience in environmental permitting, marine and freshwater fisheries biology, water resources and rare species. I have prepared a variety of environmental permit applications and reports on a wide range of projects requiring an understanding of the environmental permitting process using federal, state and local criteria. For the past eight years, I have focused on the assessment and mitigation of environmental impacts from the construction of linear energy projects.

Q. What has been your role in the South Norwalk Electric and Water's proposed substation that is the subject of this docket?

A. I have provided environmental consulting services to South Norwalk Electric and Water in support of the Application. Specifically, I prepared or supervised the preparation of the sections of the Application related to civil engineering, the inventory of existing environmental conditions and mitigation of potential adverse

environmental effects. In addition, I prepared or assisted in the preparation of responses to the Siting Council's interrogatories related to these subjects.

Q. Are you prepared to address those sections of the Application and the interrogatories that you prepared or assisted in preparing?

A. Yes.

Q. At this time, are there any additions or corrections to the materials that you prepared?

A. No.

Q. Is the information in the Application and Interrogatory Responses that you prepared or assisted in preparing true and accurate to the best of your knowledge and belief?

A. Yes.

Q. Does this conclude your testimony?

A. Yes

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

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MARTIN LUTHER KING, JR. DRIVE, :
NORWALK, CONNECTICUT : DECEMBER 4, 2012

PRE-FILED TESTIMONY OF MANRICO FEDERICO

Q. Please state your name, title and business address.

A. Manrico Federico, P.E.
Senior Engineer/Project Manager
Mott MacDonald
400 Blue Hill Drive
Suite 100, North Lobby
Westwood, MA 02090

Q. Please describe your current responsibilities and professional expertise.

A. I am an electrical engineer at Mott MacDonald, a world-wide provider of engineering and consulting services to a broad range of public and private markets. In the power market, we have expertise in traditional and renewable electric generation, transmission and distribution. I have been directly responsible for the design and installation of numerous substations and other transmission system upgrades in Connecticut and Massachusetts. Additional details regarding my qualifications are described in my resume, attached hereto.

Q. What has been your role in the South Norwalk Electric and Water's proposed substation that is the subject of this docket?

A. I have provided consulting engineering services to South Norwalk Electric and Water on the substation components, interconnections and support structures. I assisted in the preparation of the sections of the Application and responded to the interrogatories that address the engineering aspects of the project.

Q. Are you prepared to address those sections of the Application and the interrogatories that you prepared or assisted in preparing?

A. Yes.

Q. At this time, are there any additions or corrections to the materials that you prepared?

A. No.

Q. Is the information in the Application and Interrogatory Responses that you prepared or assisted in preparing true and accurate to the best of your knowledge and belief?

A. Yes.

Q. Does this conclude your testimony?

A. Yes

Summary CV

Manrico Federico, P.E.
Senior Engineer / Project Manager

Profile

A senior electrical engineer at Mott MacDonald with over 15 years of experience in engineering and design of power plants, substations, and distribution systems.

Experience and skills

2009-present

Mott MacDonald LLC

(Member firm of Mott MacDonald Group)

(Incorporating Careba Power Engineers, LLC)

2005-2009

Careba Power Engineers, LLC joined

Mott MacDonald Group

Selected projects

NGRID – Meadowbrook Substation

Install 2 new 115/13.2kV substation transformers, install breaker and a half switchgear for eight feeders with control house in new MCSPC building, new bus capacitors, new cable trench, new 115kV terminal dead end structures. Addition of new line taps to new transformers. Create station schematic, wiring, MCSPC layout drawings. Created primary and secondary equipment specifications for equipment purchases based on NG standard requirements.

NGRID – East Longmeadow Substation

Replacement of 69kV line air break switches with 115kV circuit switchers with new line towers, replace 69kV tie breaker with 115kV tie breaker, upgrade 6.25MVA to 40MVA substation transformer, upgrade station service transformers, install new feeder bay, replace and upgrade exiting 13.2kV bus disconnects and install new capacitor banks. Install new control house with new control and relay panels, new AC and DC systems and new yard control cable trench system. Provide provision for 115kV mobile substation. Created primary and secondary equipment specifications for equipment purchases based on NG standard requirements.

NUSCO Peaceable, Tracy, and Rocky River substation arc-flash projects

Arc Flash relay replacement – installation of new primary relays and feeder metering devices. Installation of new communication and SCADA equipment for distribution SCADA. SCADA system allows for the remote application of the fast trip arc flash relay features prior to any commencement of work.

NSTAR – Allston Substation transformer replacement

Removed and replaced substation transformers. Re-routed underground conduit systems to merge 5 distribution transformers into three upgraded distribution transformers. Added transformer protection relay panels. Replaced station RTU, annunciator and auto-bus restore systems. Station online during upgrades.

NSTAR – BPS Transmission line relay upgrades

Multiple substation projects to replace and upgrade BPS transmission line relaying and communication between NSTAR and NGRID BPS transmission lines.

NUSCO – Stony Hill Switchgear expansion

Installation of four new feeder position on existing switchgear bus. Includes primary relays and feeder metering devices. Installation of new communication and SCADA equipment for distribution SCADA

NUSCO – South Naugatuck Substation Arc Flash relay replacement

Installation of new primary relays and feeder metering devices. Installation of new communication and SCADA equipment for distribution SCADA. SCADA system allows for the remote application of the fast trip arc flash relay features prior to any commencement of work.



Position

Senior engineer / Project Manager

Qualifications

BSEE, Worcester Polytechnic Institute (WPI), Worcester, MA, 1992

Certification: PE

Member of the Institute of Electrical and Electronic Engineers (IEEE)

Key skills

Engineering and design of power plants and substations



MANRICO FEDERICO, P.E.

Profession	Electrical Engineer
Specialization	design of power plans, substations and distribution systems
Position in Group	Senior Engineer – Transmission and Distribution Division, America
Year of joining Group	2007

KEY QUALIFICATIONS

A senior electrical engineer at Mott MacDonald with over 15 years of experience in engineering and design of power plants, substations, and distribution systems.

EDUCATION AND PROFESSIONAL STATUS

Certification: Professional Engineer (PE)

Member of the Institute of Electrical and Electronic Engineers (IEEE)

BSEE, Worcester Polytechnic Institute (WPI), Worcester, MA

EXPERIENCE RECORD

2009 - Present MOTT MACDONALD LLC
(Member firm of Mott MacDonald Group)

2009 - Present Senior Engineer/ Project Manager – Transmission and Distribution
Division, America

NGRID – Meadowbrook Substation

Install 2 new 115/13.2kV substation transformers, install breaker and a half switchgear for eight feeders with control house in new MCSPC building, new bus capacitors, new cable trench, new 115kV terminal dead end structures. Addition of new line taps to new transformers. Create station schematic, wiring, MCSPC layout drawings. Created primary and secondary equipment specifications for equipment purchases based on NG standard requirements.

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NUSCO Peaceable, Tracy, and Rocky River substation arc-flash projects

Arc Flash relay replacement – installation of new primary relays and feeder metering devices. Installation of new communication and SCADA equipment for distribution SCADA. SCADA system allows for the

remote application of the fast trip arc flash relay features prior to any commencement of work.

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NSTAR – BPS Transmission line relay upgrades

Multiple substation projects to replace and upgrade BPS transmission line relaying and communication between NSTAR and NGRID BPS transmission lines.

NUSCO – Stony Hill Substation

Switchgear expansion – installation of four new feeder position on existing switchgear bus. Includes primary relays and feeder metering devices. Installation of new communication and SCADA equipment for distribution SCADA.

**2007 – 2009 Careba MOTT MACDONALD INC
(Member firm of Mott MacDonald Group)**

2007 – 2009 Senior Engineer – Transmission and Distribution Division, America

NUSCO – South Naugatuck Substation, CT

Arc Flash relay replacement – installation of new primary relays and feeder metering devices. Installation of new communication and SCADA equipment for distribution SCADA. SCADA system allows for the remote application of the fast trip arc flash relay features prior to any commencement of work.

NUSCO – Southwick Substation, MA

Replacement of end of life existing switchgear with new switchgear. Service included detailed design of protection, control and relaying. Designed new D and T SCADA and communication cabinets with data collection and reporting and radio communication devices.

NUSCO – South Meadow Substation, CT

Arc Flash relay replacement – installation of new primary relays and feeder metering devices. Installation of new communication and SCADA equipment for distribution SCADA. SCADA system allows for the remote application of the fast trip arc flash relay features prior to any commencement of work.

NUSCO – Baldwin Substation, CT

Arc Flash relay replacement – installation of new primary relays and feeder metering devices. Installation of new communication and SCADA equipment for distribution SCADA. SCADA system allows for the remote application of the fast trip arc flash relay features prior to any commencement of work.

Noble Environmental Power Wind Farms and Substations, Upstate NY

Assisted in the detail engineering for the installation of 230kV substations and the 35kV collector systems. Included site engineering and testing assistance.

Genzyme, Boston, MA

Project engineer for detailed design of a 1.5MW combustion turbine with HRSG, three 20000 lb/hr boilers and an additional 8MW of standby EDG supply. Included generator paralleling control and distribution

switchgear, MV distribution switchgear and utility tie interconnect. Plant will supply all system steam requirements and 60% of electrical demand for manufacturing process.

NRG Cos Cob, Greenwich, CT

Assisted lead electrical engineer on the detail design for the addition of two additional Pratt-Whitney FT4 jets for re-powering project to add 40MW additional capacity to an existing 60MW site. Work included, specification, switchyard layout, switchyard elevations, one-line, 3-lines, schematic diagrams, wiring diagrams, relaying, metering, relaying and control panel modifications, grounding, relay settings, vendor document review, and NUSCO drawing modifications. Provided on site field engineering support during construction for technical assistance in connecting/integrating the Owners purchased used equipment. Provided oversight of upgraded generator breakers to 1500MVA, 15kV, vacuum breakers and modification of non-seg generator lead connections to generator breakers to cable connection in four cases.

S&W Energy Solutions, Inc. Gas Turbine Power Plant Shuwaika, Kuwait

Assisted lead electrical engineer with installation of six GE LM6000 combustion turbines (300 MW) gas fired power plant in Kuwait. Work included specifying, reviewing and recommending electrical distribution equipment for purchase.

2005 – 2007 Careba / Careba Mott MacDonald

2005 – 2007 Senior Engineer

Northeast Utilities Service Company, Watertown, CT

Project engineer for 115/15 kV substation expansion. Services included detailed engineering for the installation of 115 kV tie breaker, new 115/15kV 47 MVA transformer, 115 kV circuit switcher, 13.8 kV distribution switchgear, relaying, control and protection.

Northeast Utilities Service Company, Madison, CT

Project engineer for 115/23 kV substation expansion. Services included the installation of new 115 kV tie breaker, 115 kV circuit switcher, new 115/23 kV 47 MVA transformer, 23 kV distribution switchgear and bus feeder tie switches, controls, relaying and protection.

Northeast Utilities Service Company, Waterbury, CT

Project engineer for 115/13.8/4.8 kV substation expansion. Services included detailed engineering for adding open air 4.8 kV distribution bus and double ended metal clad switchgear.

2003 – 2005 National Grid USA

2003 – 2005 Planning Engineer

National Grid USA, North Shore District, MA

Planning engineer for power system analytical planning study investigating summer normal and summer single contingency thermal loading issues on the supply and delivery system supplying distribution networks with 500 MW peak load. 115/23/13.8/ and 4 kV distribution systems modeled using GE PSLF load flow and ASPEN software.

2000 – 2003 Vanderweil Engineers

2000 – 2003 Senior Engineer – Mission critical group

Fidelity Investments, Boston, MA.

Project engineer for 2000 sq ft. raised floor, 68W/sq ft raised floor computer area served by 4 – 400 kVA online UPS units with redundant supply, double ended substation and digital static transfer switches. Performed short circuit and coordination study using SKM System software.

Fidelity Investments, Boston, MA

Project engineer for retrofit of new controls and power distribution for support of 4 – 900 ton chillers for high rise. Included 4 3000A, 480 VAC switchboards, two VFD drives and two starters. Included motor starting model using SKM System software.

1998 – 2003 Stone & Webster

1998 – 2003 Senior Engineer – Nuclear Division

Taiwan Power Company, Lungman Nuclear power project, Unit #5, Taiwan

Electrical controls engineer for instrumentation for valves, pumps, circuit breakers and monitoring in support of 600 MW nuclear plant. Created elementary wiring and schematics for all electrical equipment.

Commonwealth Edison, Braidwood #2, Braidwood, Ill

Electrical controls engineer in support of 5% up rate of 1129MW Braidwood Unit #2. Services included instrument set point scaling calculations.

Commonwealth Edison, Byron #2, Byron, Ill

Electrical controls engineer in support of 5% up rate of 1131MW Byron Unit #2. Services included instrument set point scaling calculations.

US Army, Chemical facility, Aberdeen, MD

Project engineer for 6 – 5 kV 2 MW diesel paralleling generating plant. Included controls, paralleling and distribution equipment.

1998 Varian IIS

1998 Electrical Design Engineer (R&D)

Designed to cost the electrical and control distribution system for ion implant system using industry standards for high and low voltages. Created electrical, pneumatic, and fiber optic engineering schematics. Selected connection components and performed analytical tasks for product manufacturing and improvement of the ion implant system. Oversaw the control, power, pneumatic and fiber optic distribution layout of modbuild machine of new line implanters. Involved with 5KV thru 80KV low current power supplies.

1992 – 1998 Russelectric Inc.

1992 – 1998 Field Engineer - US

UPS, Alpharetta, GA

Field engineer for 12 – 13.8kV 1.8MW dual bus generators, including synchronizing, paralleling, distribution switchgear, remote monitoring and controls.

State Farm Insurance, Phoenix, AZ

Field engineer for 8 – 13.8 kV 2 MW redundant bus, generation, including synchronizing, paralleling, distribution switchgear, redundant PLC controls. Dual fed double ended distribution substations with Kirk key interlocks.

IRS, Islip, NY

Field engineer for 2 – 300 kVA rotary ups units in support of critical space. Services included distribution equipment.

STATE OF CONNECTICUT
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MARTIN LUTHER KING, JR. DRIVE, :
NORWALK, CONNECTICUT : DECEMBER 4, 2012

PRE-FILED TESTIMONY OF DOUGLAS H. BELL

Q. Please state your name, title and business address.

A. Douglas H. Bell
Principal Consultant
Cavanaugh Tocci Associates Inc.
327F Boston Post Road
Sudbury, MA 01776

Q. Please describe your current responsibilities and professional expertise.

A. I have been a Principal Consultant for Cavanaugh Tocci Associates since 1989. Cavanaugh Tocci Associates has been providing noise measurement services to the general public and industry since 1975. Cavanaugh Tocci Associates has performed numerous environmental impact studies for projects, including power plants and electric infrastructure improvements. Additional details regarding my qualifications are described in my resume, attached hereto.

Q. What has been your role in the South Norwalk Electric and Water's proposed substation that is the subject of this docket?

A. I have provided consulting services to South Norwalk Electric and Water relating to the measurements and assessment of sound from the proposed South Norwalk substation. Specifically, I prepared the "Environmental Sound Evaluation Report," dated May 2, 2012, which is included as Exhibit 11 of the Application and assisted in the preparation of those sections of the Application related to sound.

Q. Are you prepared to address those sections of the Application and the interrogatories that you prepared or assisted in preparing?

A. Yes.

Q. At this time, are there any additions or corrections to the materials that you prepared?

A. No.

Q. Is the information in the Application and Interrogatory Responses that you prepared or assisted in preparing true and accurate to the best of your knowledge and belief?

A. Yes.

Q. Does this conclude your testimony?

A. Yes

Education:

Massachusetts Institute of Technology, BS 1982

Professional Affiliations:

Member, Acoustical Society of America
Member, Institute of Noise Control Engineering

Publications:

Co-Author, *Industrial Noise Control-Fundamentals and Applications*, Second Edition, Marcel Dekker, Inc., New York, 1993.

Experience:

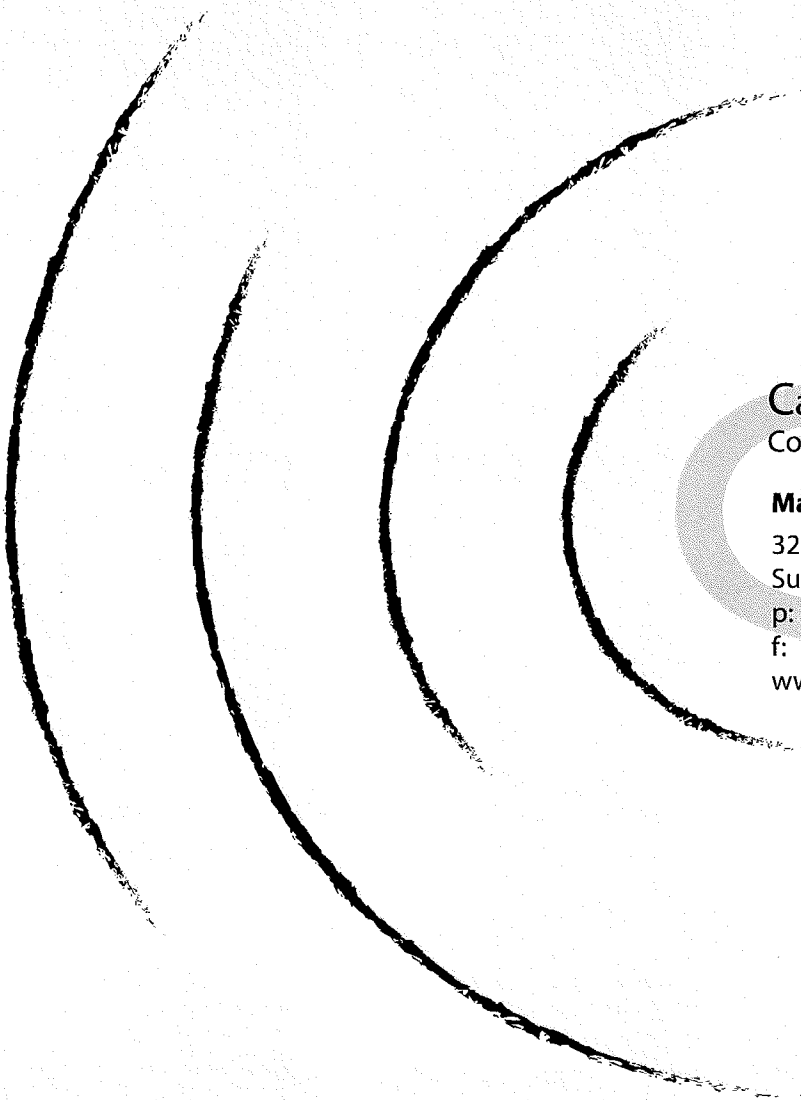
1989 – Present	Principal Consultant CAVANAUGH TOCCI ASSOCIATES, INC. Sudbury, MA
1982 – 1989	Application Engineer, Project Manager Briel and Kjaer Instruments, Inc. Marlborough, MA

Mr. Bell is a consultant to architects, engineers, and industrial clients in the analysis and control of noise and vibration in buildings, and the environment. Typical projects include noise impact assessment for industrial facilities, noise impact analysis for transportation systems, evaluation of worker noise exposure, and the control of structureborne and groundborne noise and vibration.

Mr. Bell also specializes in the field of vibration with respect to sensitive applications in laboratory, manufacturing, and medical facilities. Typical projects include pre-installation site evaluations, development of appropriate design goals for new laboratory facilities, evaluation and control of occupant induced vibration, and development of vibration isolation recommendations for mechanical systems and sensitive equipment.

Representative projects on which Mr. Bell has consulted include:

- **Bethlehem Energy Center, Bethlehem, NY**
Environmental noise impact analysis including baseline noise monitoring, facility sound modeling, recommendations for facility sound control, application preparation, and testimony at public hearings for a 750-megawatt combined-cycle combustion turbine power plant.
- **LeMessurier Consultants, Cambridge, MA**
Design, development and testing of tuned mass dampers to control occupant induced vibration on long floor spans at the Davis Museum and Cultural Center in Wellesley, MA
- **Dana Farber Cancer Institute, Boston, MA**
Site vibration evaluation, facility design criteria, and building foundation vibration isolation design for a 14-story building used to conduct vibration sensitive research in an urban environment.



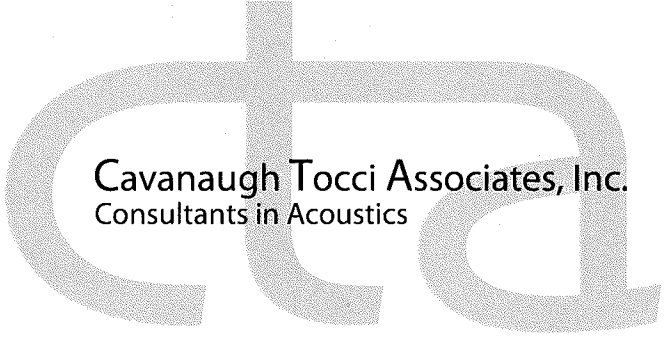
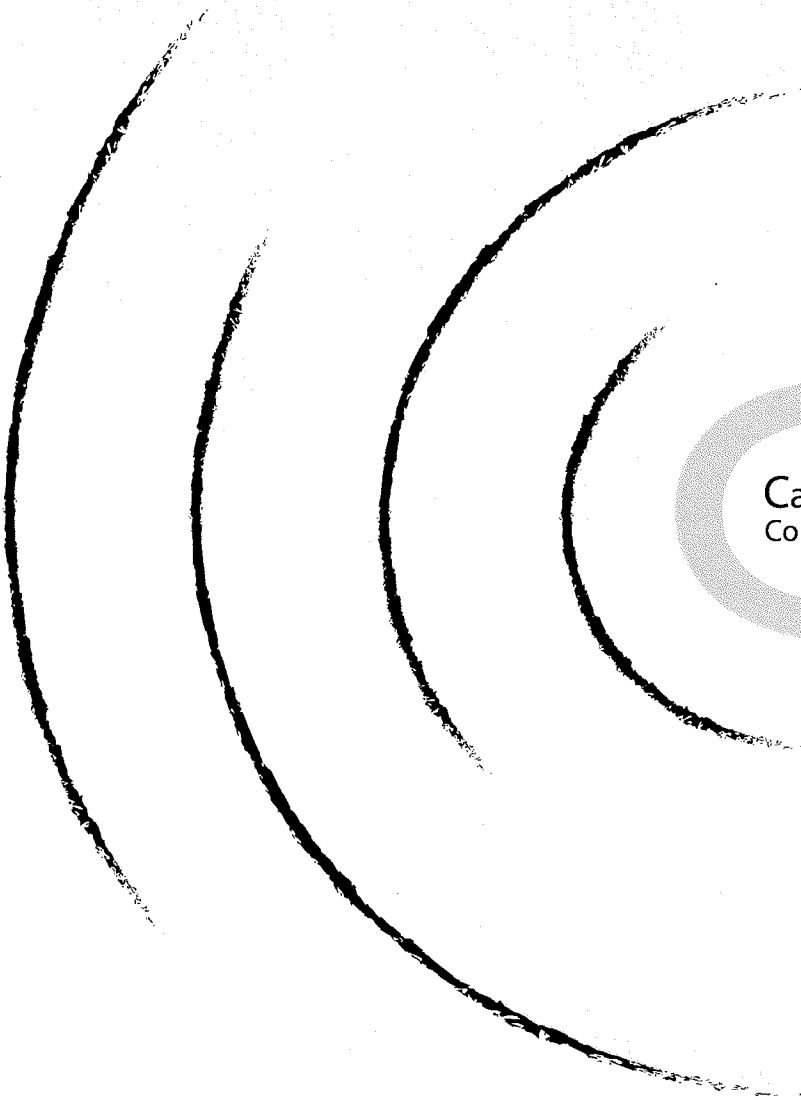
Cavanaugh Tocci Associates, Inc.
Consultants in Acoustics

Main Office

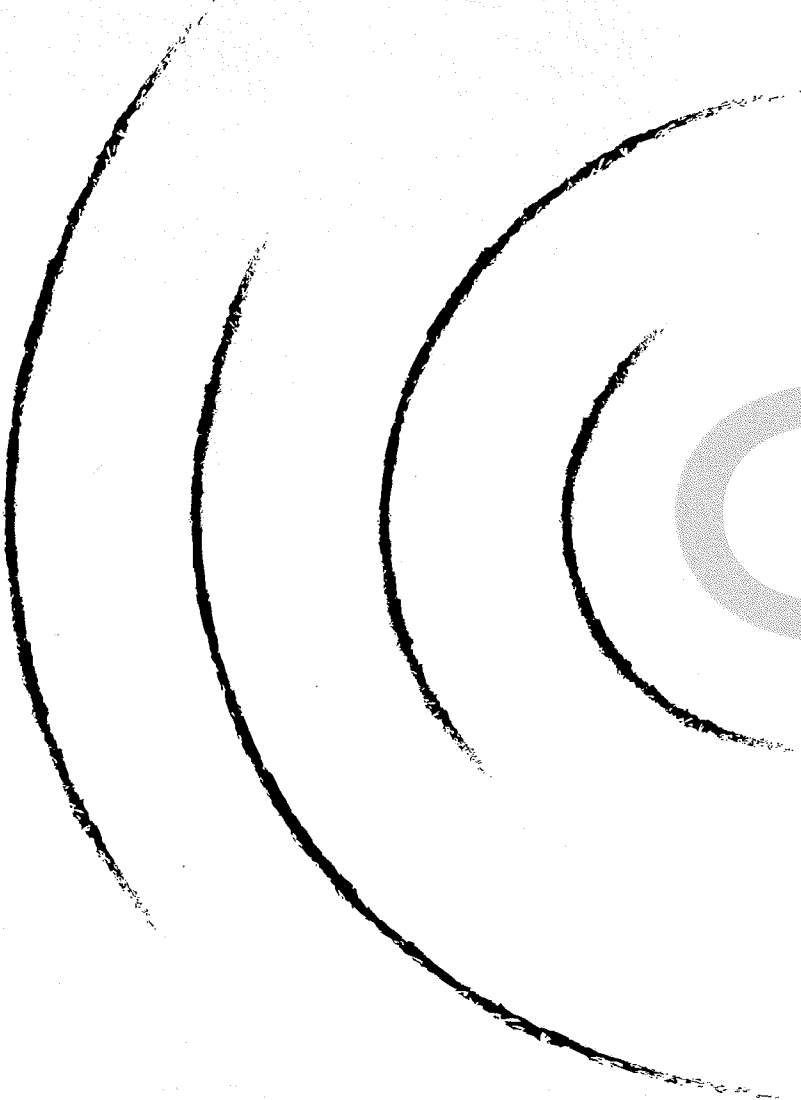
327F Boston Post Road
Sudbury, MA 01776
p: (978) 443-7871
f: (978) 443-7873
www.cavtocci.com

Boston Office

470 Atlantic Avenue
p: (978) 443-7871



Cavanaugh Tocci Associates, Inc.
Consultants in Acoustics



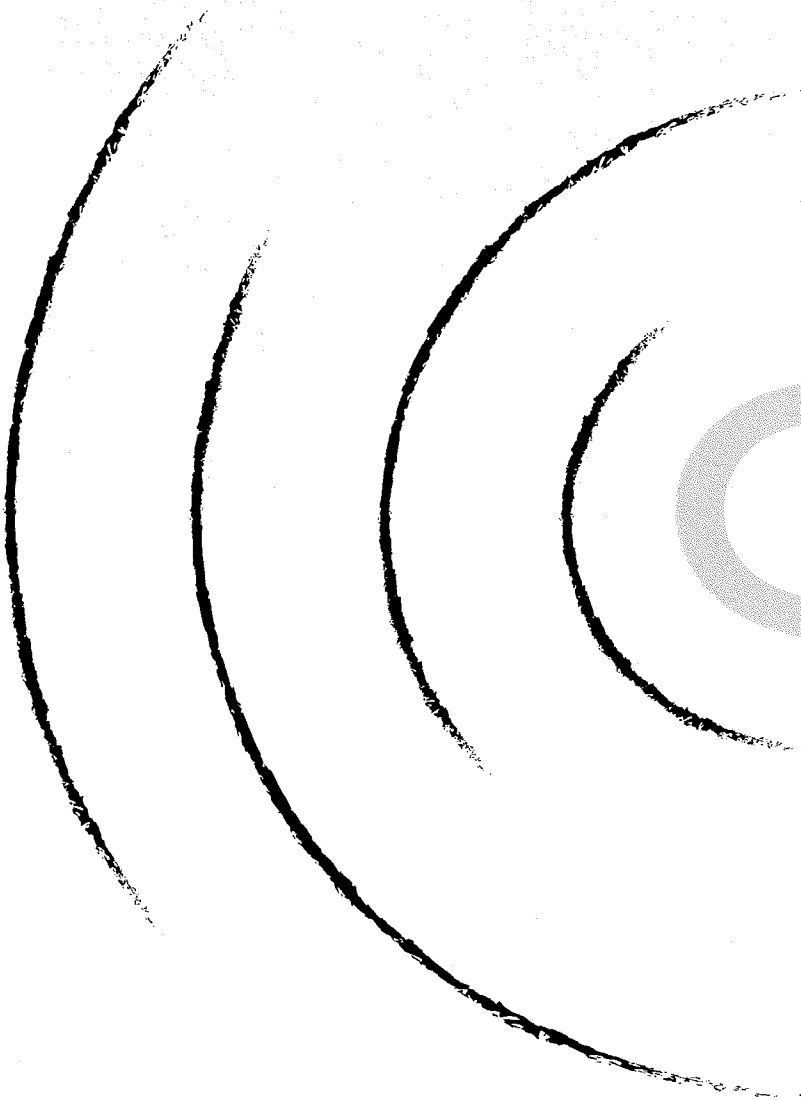
CONSULTING SERVICES IN ACOUSTICS

Cavanaugh Tocci Associates, Inc. was founded in 1975 to serve the growing need for technical expertise and consulting services in architectural, industrial, and environmental acoustics. The consulting staff holds advanced degrees in architecture, acoustics, and mechanical engineering, and is supported by a full complement of measurement and analysis instrumentation. The diverse experience of the staff members allows us to develop creative solutions to problems by using an interdisciplinary approach.

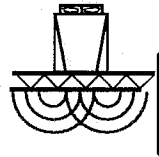
The service objective is to provide practical, cost-effective, and timely consulting advice on all types of sound and vibration problems. Cavanaugh Tocci Associates, Inc. has completed thousands of consulting assignments ranging from brief consultations of a few hours to extended projects spanning several years.

Most projects include one or more of the following categories of acoustical study:

- Mechanical System Noise and Vibration Control
- Speech Privacy - Open Plan and Enclosed Offices
- Auditorium, Theatre, Studio, and Concert Hall Acoustics
- Sound System Design, Specification and Evaluation
- Sound Isolation - Residential and Commercial
- Workplace Noise Exposure
- Environmental Noise Impact Assessment
- Site Evaluation for Residential and Commercial Buildings
- Construction Noise
- Expert Testimony for Legal Proceedings and Public Hearings
- Training Seminars and Manuals
- Technical Material for Product Literature

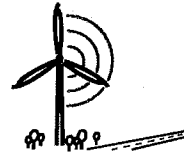


Architectural
Acoustics

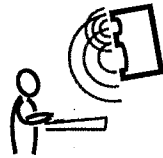


Building and
Mechanical
Isolation

cta



Environmental
Acoustics



Sound and Video
Systems

Architectural Acoustics encompasses both the cultivation of desired sound and the attenuation of undesired sound. Several factors influence how sound propagates and is perceived: the interaction between sound waves and specific interior finishes, the mass of surfaces defining the room, room geometry and volume, the sound level of the source, and the background sound level created by building systems (heating, ventilation and air conditioning). The interplay of these factors determines the subjective acoustical impression of room occupants. Architectural Acoustics encompasses several specific concepts, each with a unique importance to a given project; these concepts include:

Sound Isolation – Sound isolation review involves understanding the intended use of each space, and preventing sound generated within one space from affecting adjacent spaces. Factors that influence sound isolation are partition construction, floor/ceiling assemblies, and existing background sound levels. Sound isolation is particularly important in performance and rehearsal facilities, multi-family residential facilities, mixed use facilities, hotels, and recording/television production studios.

Speech Privacy – Speech privacy is related to sound isolation, and involves the evaluation of room layouts, intended partition constructions, and the activities taking place in the spaces. Speech privacy is essential for several building types including healthcare facilities, open plan offices, and banks or financial management offices.

Speech Intelligibility – Speech Intelligibility is influenced by reverberation time, background sound levels, the loudness of the sound source, the design of an amplification system (if present), and the geometry of the room and room surfaces. Speech intelligibility is important in lecture halls, classrooms, auditoria, halls for dramatic performances, large athletic facilities, courtrooms, and television studios.

Reverberation Time – The reverberation time is a measure of the decay of sound energy within a space. Reverberation time is one of several room acoustic parameters (in addition to listener envelopment and the arrival time of early sound reflections) that is used to evaluate musical clarity and speech clarity within a space. Reverberation time is influenced by room volume, geometry, and room finishes, and is important to the success of lecture halls, conference rooms, performance spaces, lobby/atrium spaces, and large scale athletic facilities.



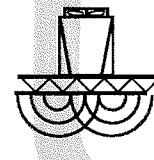
Architectural
Acoustics

The prevention and attenuation of structure-borne vibrations is the goal of mechanical equipment and building isolation. Once vibration is transferred into a structure, it may be felt, or in some cases heard (as sound re-radiated by partitions and floor/ceiling assemblies) in areas of a building at great distances from the source. We work with architects and engineers to design systems that are quiet from the outset. We also consult on existing buildings to measure and document noise problems and recommend corrective measures.

Vibrations may enter a structure through several means including rigid connections to mechanical equipment, rigid connections between the building superstructure and the foundation, and through occupant activity (footfall impacts, the movement of carts containing equipment, etc.). Proper isolation of mechanical equipment necessitates an understanding of the method of vibration generation, knowledge of structural mechanics, and an understanding of the dynamics of oscillating systems. In cases where a building is sited near or above transportation arteries, the entire building itself may require isolation from its foundation to prevent intrusive vibrations from compromising functionality.

Mechanical Equipment and Building Isolation is integral to creating a sustainable environment that serves building occupants and their activities. While Mechanical Equipment isolation is reviewed in the context of MEP System Noise (i.e. noise induced by vibration from MEP systems), more detailed building isolation studies are typically reviewed in projects such as:

- Laboratory/Research facilities containing vibration-sensitive equipment
- Buildings located above or in close proximity to highways, rail lines, and subways
- Educational facilities
- Multi-function athletic facilities
- Performance venues with critical adjacencies such as corridors near or above performance spaces
- Buildings that include long structural spans such as hotels (ballrooms) and airport terminals
- Television and recording studios
- Power generation facilities

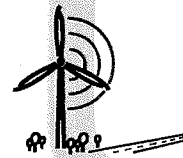


Building and
Mechanical
Isolation

Environmental acoustics is the study of sound propagation and absorption in the exterior environment. These projects typically involve predicting or measuring noise at specific locations and providing objective criteria for evaluating the noise as well as recommendations for noise abatement. The variables that affect outdoor sound propagation include site topography, nearby structures, vegetation and typical outdoor temperature and humidity.

Environmental acoustics is also related to sound isolation for interior spaces, as existing exterior sound levels and the type of construction of the building envelope determine the degree to which outdoor noise intrudes into interior spaces. Review of exterior noise is integral to several project types including residential construction (multi-unit and single-family), healthcare facilities, educational facilities, and worship spaces. Environmental acoustics includes the analysis of several unique types of sound sources and modes of sound generation:

- Line sources of sound such as highways and railroad lines
- Aircraft noise
- Construction sites with nearby sensitive sound receptors (residential neighborhoods, hospitals, churches, libraries, schools, etc.)
- Industrial complexes including power generation facilities, mining facilities, and water treatment facilities
- Outdoor rooftop equipment (air-cooled & water-cooled cooling towers, chillers, air handling units)
- Cellular tower installations



Environmental
Acoustics

The design of sound and video systems to support and enhance performances and presentations is integral to a wide variety of spaces including performance venues, lecture halls, sports arenas, worship spaces, transportation hubs, conference rooms and recording/television studios.

Sound system design considers room geometry and acoustics, locations of the sound sources, and audience locations. An excellent sound system enhances speech intelligibility for spoken word presentations and complements musical performances.

Video system design considers room geometry, presenter location and source material, audience locations, and ambient light levels. An excellent video system design enhances presentations with displays chosen for good readability and easy to use operator controls.

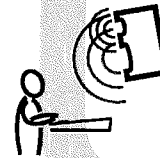
Audio and video systems are highly integrated and must be carefully tailored to the specific functional requirements of the space and to the architecture.

Audio and video system design draws on a wide range of knowledge including digital signal processing, electrical engineering, power and grounding practices, architectural acoustics, and psychoacoustics (how sounds are perceived by the brain).

Applications for our systems include:

- live sound reinforcement
- audio and video playback
- audio recording
- production intercom
- assistive listening
- audio and video monitoring
- paging and announcement
- video projection
- sound masking
- video recording and broadcast

Work can also include the design of integrated control systems that create a single operator interface to control multiple devices and systems within a room including audio, video, lighting, motorized shades and climate control systems.



Sound and Video
Systems

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

SOUTH NORWALK ELECTRIC AND WATER : DOCKET NO. 431
APPLICATION FOR A CERTIFICATE OF :
ENVIRONMENTAL COMPATIBILITY AND :
PUBLIC NEED FOR THE CONSTRUCTION, :
MAINTENANCE AND OPERATION OF AN :
ELECTRICAL SUBSTATION AND ITS :
CONNECTION TO AN EXISTING 115 KV :
TRANSMISSION LINE, LOCATED AT 180 DR.:
MARTIN LUTHER KING, JR. DRIVE, :
NORWALK, CONNECTICUT : DECEMBER 4, 2012

PRE-FILED TESTIMONY OF PETER A. VALBERG

Q. Please state your name, title and business address.

A. Dr. Peter A. Valberg
Principal
Gradient
20 University Road
Cambridge, MA 02138

Q. Please describe your current responsibilities and professional expertise.

A. My background is in human health risk assessment, inhalation toxicology and modeling of human exposure to environmental chemicals. I perform risk assessments to evaluate the potential health impacts of a variety of environmental conditions, including electromagnetic fields from power lines, radio waves and cellular telephones. I assist my clients with electromagnetic assessment issues pertaining to utility and communication infrastructure. These issues include permitting and environmental impact of transmission lines, substations and generation facilities. Additional details regarding my qualifications are described in my resume, attached hereto.

Q. What has been your role in the South Norwalk Electric and Water's proposed substation that is the subject of this docket?

A. I have provided environmental services to South Norwalk Electric and Water ("SNEW") relating to the evaluation and mitigation of electric and magnetic fields related to the substation and transmission interconnection. I prepared the "Electric and Magnetic Field ("EMF") Analysis for South Norwalk Electric Works for the proposed SNEW substation in Norwalk, CT," dated July 3, 2012, which is

included in the Application as Exhibit 11. I also assisted in the preparation of the discussion regarding Electric and Magnetic Fields in the text of the Application.

Q. Are you prepared to address those sections of the Application and the interrogatories that you prepared or assisted in preparing?

A. Yes.

Q. At this time, are there any additions or corrections to the materials that you prepared?

A. No.

Q. Is the information in the Application and Interrogatory Responses that you prepared or assisted in preparing true and accurate to the best of your knowledge and belief?

A. Yes.

Q. Does this conclude your testimony?

A. Yes

Biographical Summary

Peter A. Valberg, Ph.D., Principal

Dr. Valberg is an expert in human health risk assessment, inhalation toxicology, and modeling of human exposure to environmental chemicals. He has 30 years of experience on the faculty of the Harvard School of Public Health and at Gradient. Dr. Valberg has provided air quality expertise to the Department of Justice, the US Environmental Protection Agency, and the National Academy of Sciences. He is the author of more than 100 scientific articles on biological effects of environmental exposures on humans and animals. Dr. Valberg's risk assessment expertise covers air pollutants, chemical exposures, biologicals, radionuclides, and EMF (including power lines, radio waves, and cellular telephones). Recent projects have included evaluating health impacts of airborne particulate matter, diesel exhaust, metals, asbestos, sulfuric acid, and TCE. Dr. Valberg is frequently called upon to prepare and interpret health-risk findings for a variety of audiences, and he helps apply research results to the regulatory, litigation, and public policy arenas.

Representative Projects

Health Risk Evaluation for Air Emissions: Evaluated health risks based on stack emissions estimates, air dispersion modeling, comparative dose from different sources, and multiple-pathway health risk assessment.

Hexavalent Chromium: Prepared an in-depth analysis of a risk assessment prepared for exposure to Cr6+ in surface water and groundwater. Compared how different regulatory agencies approach Cr6+ risk assessment. Provided an integrative perspective on how risk calculated for Cr6+ exposure compared to background, everyday risks.

Toxicity of Arsenic in Soils: Evaluated the scientific and epidemiological basis for arsenic toxicity and related toxicity to site-specific arsenic bioavailability. Recalculated how the cancer potency factor for arsenic is affected by water intake assumptions.

Environmental Electric and Magnetic Fields (EMFs): Reviewed and analyzed the various mechanisms by which biological systems may be affected by EMFs. Organized a workshop on EMF and leukemia, with subsequent publication in *Environmental Health Perspectives*.

Radioactive Risks: Used various US EPA and DOE models to evaluate the implications of radioactive substance migration from a contaminated site and assessed the health impact of radioisotopes, including uptake of radioactivity into plants, and, hence, into food.

Assessment of Carbon Black (CB): Evaluated the epidemiology of workers in the CB industry. Identified weight of evidence for CB toxicity for exposure via inhalation and ingestion. Reviewed data on the carcinogenicity of CB, and evaluated likelihood of human carcinogenicity for CB.

Airborne Sulfur Dioxide and Sulfuric Acid: Evaluated health impacts from short-term, acute air releases of H₂SO₄ and SO₂, as well as health risks arising from long-term, chronic exposures to these compounds.



Practice Areas & Expertise

- Inhalation Toxicology
- Exposure Modeling
- Airborne Pollutants & Particulates
- Electromagnetic Fields (EMF & RF)
- Radiation & Radionuclide Risk
- Risk Communication & Relative Risk
- Nanotechnology

Education

Ph.D., Physics, Harvard University

M.A., Physics, Harvard University

M.S., Human Physiology and Inhalation Toxicology, Harvard School of Public Health

B.A., Physics and Mathematics, Taylor University

Selected Publications

Valberg, PA; Long, CM. 2012. "Do brain cancer rates correlate with ambient exposure levels of criteria air pollutants or hazardous air pollutants (HAPs)?" *Air Quality, Atmosphere and Health*. 5:115-123.

Hesterberg, TW; Long, CM; Lapin, C; Hamade, A; Valberg, PA. 2010. "Diesel exhaust particulate and nanoparticle exposures: What do human clinical studies tell us about potential human health hazards of nanoparticles?" *Inhalation Toxicology*. 22:679-69

Valberg, PA; Van Deventer, TE; Repacholi, MH. 2007. "Base stations and wireless networks. Radiofrequency (RF) exposures and health consequences." *Environmental Health Perspect*. 115:416-424.

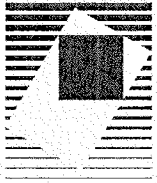
Valberg, PA. 2004. "Is PM more toxic than the sum of its parts? Risk-assessment toxicity factors versus PM-mortality 'effect functions.'" *Inhalation Toxicology*. 16(Suppl. 1):19-29.

Valberg, PA. 2003. "Ambient Particulates and Health Effects." In *A Practical Approach to Occupational and Environmental Medicine* (Ed.: McCunney, RJ), Lippincott Williams & Wilkins, Philadelphia, PA, p835-850.



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Dr. Peter A. Valberg, *Gradient*
Expertise in Electric and Magnetic Fields (EMF)

Gradient

Dr. Valberg holds a Ph.D. degree in Physics from Harvard University, from the Graduate School of Arts and Sciences. He did his doctoral thesis work with Dr. Norman F. Ramsey, Nobel Prize Winner in Physics. In addition, Dr. Valberg has an M.S. degree in Human Physiology from Harvard's School of Public Health (HSPH), and an A.B. degree *summa cum laude* in Physics and Mathematics from Taylor University. Dr. Valberg taught Physics (including Electricity and Magnetism) at Amherst College before coming back to Harvard University, and working for 25 years as a researcher and teacher in the faculty of the Department of Environmental Health at Harvard's School of Public Health, Boston, MA.

During his tenure as a faculty member at HSPH, Dr. Valberg researched and taught in the areas of toxicology and environmental health. His teaching at Harvard included Human Physiology, Inhalation Toxicology, Risk Assessment, and Electric and Magnetic Fields / Radio Frequency (EMF / RF) Case Studies. One of Dr. Valberg's research programs at HSPH was "Magnetic Field Effects on Macrophages," which was funded by the National Cancer Institute.

Dr. Valberg has served on EMF review/advisory panels for the National Institutes of Health (NIH), the Health Effects Institute, and the Environmental Protection Agency. At the Harvard Center for Risk Analysis (HCRA), Dr. Valberg was a member of the "Harvard Advisory Committee on EMF and Human Health" as well as the "Peer Review Board on Cellular Technology and Human Health." He is a member of the International Society for Environmental Epidemiology, the Health Physics Society, the Bioelectromagnetics Society, and former member of the American National Standards Institute's (ANSI) Committee on Man and Radiation (COMAR). Dr. Valberg also served on the Board of Directors of the Bioelectromagnetics Society, a society that promotes, disseminates, and publishes research on EMF.

Dr. Valberg is the author of more than 100 peer-reviewed articles on toxicology and environmental health; and he is also an expert on the physical phenomena associated with EMF / RF and the relevant biophysical interactions. Currently, Dr. Valberg is Principal and Senior Health Scientist at Gradient, a human-health risk assessment firm. At Gradient, Dr. Valberg has directed health risk assessments regarding potential effects from exposure to EMF and RF. These assessments have often included both measurement and modeling of EMF and RF levels.

In one example project, Dr. Valberg and Gradient assisted on an EMF analysis for housing project in Santa Barbara County (California). Gradient's report evaluated the current EMF levels and the potential public health impacts associated with human exposure to EMF, making note of the current scientific thinking on health effects of EMF. Gradient's analysis helped address the question of whether potential EMF impacts on dwellings and outdoor activities in proximity to existing transmission lines would be significant, or would require mitigation (*e.g.*, undergrounding or increased setbacks).

For the Massachusetts Bay Transit Authority (MBTA) Gradient helped determine the potential EMF impacts of a planned transportation corridor called the "Urban Ring." MBTA is evaluating a 15-mile-long circumferential corridor transportation corridor (the Urban Ring), which was proposed to

pass through East Cambridge, the Massachusetts Institute of Technology area, and through the Harvard Medical School area. Dr. Valberg helped synthesize the information available on EMI produced by the surface-bus and light-rail rapid-transit alternatives being considered. The final result of the project was a report to the MBTA that listed the EMI expected for various alternative technologies and route alignments as a function of distance from the corridor. Gradient also helped identify and discuss possible EMI mitigation strategies.

In another example, Dr. Valberg helped prepare environmental impact statements regarding the electric and magnetic fields (EMF) that would be produced by operation of a wind-turbine electric-power-generating project to be sited in Horseshoe Shoal off the coast of Cape Cod, MA. Gradient's EMF analysis included both possible human health effects of EMF caused by on-land portions of the project, and, for the Army Corps of Engineers, concerns related to the potential EMF ecological effects for marine- and submarine-animal species. The effects evaluated included potential precursors of disease, deleterious effects on reproduction, and/or interference with animal migration.

For the State of Connecticut, Connecticut Siting Council, Dr. Valberg assisted on reviewing the power-line EMF literature, and helped develop "*Electric and Magnetic Field Best Management Practices for the Construction of Electric Transmission Lines Facilities in Connecticut.*" This document is a siting policy for CSC to use when evaluating the placement of electric power utility transmission lines in Connecticut.

Recently, Dr. Valberg worked with the World Health Organization (WHO) on analyzing the EMF that occur in the context of cellular telephones. A summary of the WHO work was published in the journal *Environmental Health Perspectives*.

Dr. Valberg has been working in the area of EMF health risk for nearly 20 years. He has presented at several Bioelectromagnetics Society Annual Conferences, as well as at the EMF Contractors Conferences. Dr. Valberg assisted the Health Effects Institute (Boston, MA) in determining the feasibility of launching an EMF research program, and he published a summary document on "EMF Mechanisms" in the journal *Radiation Research*. At the request of the International Congress on Radiation Research (ICRR), Dr. Valberg organized and chaired a symposium on "*Physical aspects of EMF / RF effects on biological systems,*" at the 11th Annual ICRR meeting in Dublin, Ireland. Recently, he was asked to present a lecture on how EMF interacts with living organisms by the Cyprus International Institute for the Environment and Public Health in a symposium on "Electromagnetic Fields: Sources, Health Effects, and Regulations," which took place in Nicosia, Cyprus.

For the Harvard School of Public Health, Dr. Valberg helped organize a conference in the Boston area on "*Childhood Leukemia: Electric and Magnetic Fields as Possible Risk Factors.*" A summary of this workshop was published in the journal *Environmental Health Perspectives*.

Dr. Valberg's Publications on RF / EMF

Brain, JD; Kavet, R; Valberg, PA. 2012. "Observations on power-line magnetic fields associated with asthma in children." *Archives Pediatric Adolescent Medicine*. 166(1):97-8.

Valberg, PA. 2011. "Magnetic fields: Possible Environmental health effects." In: Nriagu, JO (ed.) *Encyclopedia of Environmental Health*, Vol. 3, pp. 545-557. Burlington: Elsevier.

Valberg, PA. 2007. "Modulated RF Energy: Mechanistic viewpoint on the health implications." In *Base Stations and Wireless Networks: Exposures and Health Consequences. Proceedings, International Workshop on Base Stations and Wireless Networks: Exposures and Health Consequences, Geneva, Switzerland, June 15-16, 2005*. (Eds.: Repacholi, M; van Deventer, E; Ravazzani, P), World Health Organization, Geneva, Switzerland, p33-46. Accessible at http://www.who.int/peh-emf/meetings/archive/valberg_bsw.pdf.

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Brain, J.D., R. Kavet, D.L. McCormick, C. Poole, L.B. Silverman, T.J. Smith, P.A. Valberg, R.A. Van Etten, J.C. Weaver. 2003. "Childhood leukemia: Electric and magnetic fields (EMF) as possible risk factors." *Environmental Health Perspectives* 111:962-970.

Valberg, P.A. 2000. Comparison of endogenous forces in cells to RF- and EMF-produced forces. "*Radiation Research, Volume 2: Proceedings of the 11th International Congress of Radiation Research*," (Moriarity, M., et al., Editors) International Association of Radiation Research. Allen Press, Lawrence, KS, 2000. pp. 219-221.

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Valberg, P.A. 1996. "Electric and magnetic fields (EMF): What do we know about the health effects?" *International Archives of Occupational and Environmental Health* 68:448-454.

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