



**NEBB**  
**SOUND AND VIBRATION MEASUREMENT SEMINAR**  
**OCTOBER 23—27, 2017**

**SEMINAR DATES**

OCTOBER 23-27, 2017

**SEMINAR REGISTRATION AND FEE PAYMENT DEADLINE**

SEPTEMBER 25, 2017

**OPTIONAL SOUND MEASUREMENT CP EXAM DAY**

OCTOBER 25, 2017

**OPTIONAL VIBRATION MEASUREMENT CP EXAM DAY**

OCTOBER 27, 2017

**SOUND AND VIBRATION APPLICATION SUBMISSION AND FEE**

**PAYMENT DEADLINE**

SEPTEMBER 25, 2017

**LOCATION**

NEBB TEC, GAITHERSBURG, MD



[WWW.NEBB.ORG](http://WWW.NEBB.ORG)

# ABOUT THIS SEMINAR AND INSTRUCTORS

## Description

Sound and vibration measurement is a valuable service for building owners who strive to maintain quality environments and minimize maintenance costs. Sound and vibration measurement and analysis have been shown to provide tangible cost savings.

- Sound measurement and analysis plays an important role in providing acceptable space usage for various commercial, manufacturing and industrial activities.
- Vibration measurement and analysis is a proven predictive maintenance activity that helps minimize repair and downtime costs for rotating machinery.

NEBB's Sound and Vibration Seminar is designed to prepare professionals from all disciplines in the correct methods to properly perform consistent, repeatable readings to meet sound and/or vibration specifications for projects.

## Learning Objectives

- Satisfy specification and customer requirements, know how and when to perform readings
- Make basic troubleshooting and diagnostic determinations
- Make simple recommendations and to guide appropriate parties towards possible remediation solutions

**Note: The S&V Seminar covers the engineering basics of sound and/or vibration measurement. Individuals who attend the seminar should already possess a basic understanding of sound and vibration measurement.**

## Who Should Attend

- Individuals interested in pursuing NEBB certification in sound and/ or vibration measurement
- Professionals from other disciplines who want to expand their knowledge of sound and vibration as it relates to their business
- Firms interested in learning more about sound and vibration

## Instructors

### Stuart McGregor

Engineering Dynamics, Inc., Englewood, CO



Stuart McGregor, PE has worked as an acoustical engineer at Engineering Dynamics, Inc., since 1990. He has experience analyzing, designing and measuring noise and vibration from building mechanical systems on projects ranging from residential condominium buildings to commercial and industrial spaces. He is a member of NEBB's Sound and Vibration (S&V) Committee.

### Kevin Gaghan

Gaghan Mechanical, Inc., Alexandria, VA



Kevin Gaghan has worked in the mechanical field since 1979 and has been a NEBB Certified Professional since in 1991 for Testing, adjusting and Balancing and Sound and Vibration disciplines.

He started his own mechanical contracting business in 1996. He is active in NEBB's national and chapter committees, contributing to Capital MarVa since 1994 and serving on the NEBB S&V Committee since 2003.

# SEMINAR SCHEDULE AND OUTLINE

## Recommended Readings

- *Procedural Standards for the Measurement and Assessment of Sound and Vibration*
- *Sound and Vibration Design and Analysis*

All NEBB publications are available for purchase by completing information on the registration form or by purchasing online at [www.nebb.org](http://www.nebb.org).

## Important Reminders

1. **Seminar registration and Fee Payment deadline is Monday, September 25, 2017.**
2. **Enrollment is limited to 25 attendees.**
3. Registrations will be filled on a “first come-first paid” basis.
4. Seminar fees include course instruction, lunch, and morning and afternoon breaks.
5. Seminar fees do not include anything pertaining to the certification process.
6. Registrants will receive a confirmation letter which will include instructions regarding required seminar materials and other pertinent information.
7. Questions? Call 301.977.3698 or email [training@nebb.org](mailto:training@nebb.org).

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**Please note:** This seminar is not an exam review or exam refresher seminar. Attendees should be aware that this is an educational seminar and attending this seminar is not sufficient for successful completion of the Sound and Vibration Measurement CP exam. The material presented, along with time allocated, is only meant to provide an overview of the engineering principles and field practices required of project-management level personnel.

**This Sound & Vibration Measurement Seminar has been awarded 24.75 continuing education credits (CECs) by NEBB.**

## Seminar Schedule

**October 23, 2017 (6.0 CECs)**

**Sign in**

**7:00 am—8:00 am**

**8:00 am - 5:00 pm**

*Includes 15 minute morning and afternoon breaks*

**NEBB Sound Certification**

- Physics of Sound
  - Logarithms
  - Sound Sources
  - Attenuation of Sound
  - Free Field Conditions
  - Reverberant Fields
  - Near Field Conditions
  - Adding and Subtracting Sound Levels
  - Weighting Curves (A, C, Flat)
  - Human Response to Sound
- Taking readings of sound level measurements
- Practice Problems

**October 24, 2017 (6.0 CECs)**

**8:00 am - 5:00 pm**

*Includes 15 minute morning and afternoon Breaks*

**NEBB Sound Certification**

- Review of Day 1 Material (Q & A)
- Sound Level Instrumentation
- Calibration of Sound Level Instrumentation
- Sound Level Measurements
  - Background and Ambient Sound Levels
  - What is a valid measurement?
  - Indoor Sound Level Measurements
  - Outdoor Sound Level Measurements
  - Overall Sound Levels, dB(A)
  - NC and RC Charts
- Analysis of Sound Measurement Data
- NEBB Documentation Procedures
- Practice Problems
- Practice making sound level measurements
- Practice Plotting NC and RC Charts

*(schedule continued on next page)*

# SEMINAR SCHEDULE AND REQUIREMENTS

## October 25, 2017 (3.25 CECs)

**8:00 am - 12:00 pm**

### **NEBB Sound CP Written & Practical Exams – Optional Examinations**

- Written Examination – 2 hours
- Practical Examination – ½ hour
- 10 slots available
- Exams scheduled in the order of registrations
- Separate application required

Email [certification@nebb.org](mailto:certification@nebb.org) for information.

**1:00 pm - 5:00 pm**

*Includes a 15 minute afternoon Break*

### **Vibration Fundamentals**

- Acceleration, Velocity, Displacement
- Simple Harmonic Motion
- Single Degree of Freedom Systems
- Relationship between Acceleration, Velocity, Displacement Phase

## October 26, 2017 (6.0 CECs)

**8:00 am - 5:00 pm**

*Includes 15 minute morning and afternoon breaks*

### **Vibration Fundamentals**

- Vibration Unit Conversion Calculations
- Vibration Instrumentation
  - Overall vibration level meters
  - Spectrum Analyzers
  - Frequency Range
  - Bandwidth
  - Lines of Resolution
  - Frequency Resolution
  - Windowing
  - Transducer Sensitivity
  - Accelerometers, Velocity Transducers and Displacement Sensors

## October 27, 2017 (3.25 CECs)

**8:00 am - 12:00 pm**

*Includes a 15 minute morning break*

### **Vibration Fundamentals**

- Practice making vibration measurements
- Introductory Analysis of Vibration Measurements

### **Vibration Fundamentals**

- Review of Day 2 material
- Question and Answer Session

**1:00 pm - 5:00 pm**

### **NEBB Vibration CP Written & Practical Exams – Optional Examinations**

- Written Examination – 2 hours
- Practical Examination – ½ hour
  - 10 Slots available
  - Exams scheduled in the order of registrations
- Separate application required

Email [certification@nebb.org](mailto:certification@nebb.org) for information.

# HOTEL, TRANSPORTATION AND IMPORTANT DATES AND TIMES

## Important Dates and Times

### Seminar Location

NEBB TEC  
8575 Grovemont Circle  
Gaithersburg, MD 20877

### Seminar Registration Deadline

September 25, 2017

### Seminar Dates and Times

October 23—October 27, 2017

8:00 am – 5:00 pm (approximately each day. Please refer to Seminar Schedule for exact times)

### Optional Exam Days:

#### Sound Measurement CP Written Exam:

October 25, 2017 Morning

#### Sound Measurement CP Practical Exam:

October 25, 2017 Morning

#### Vibration Measurement CP Written Exam:

October 27, 2017 Afternoon

#### Vibration Measurement CP Practical Exam:

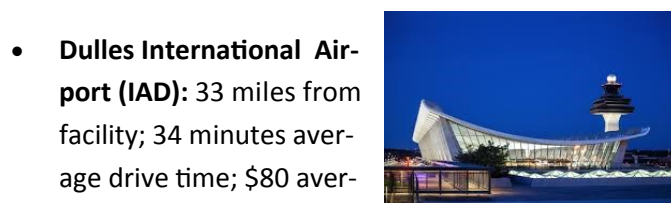
October 27, 2017 Afternoon

## Airport

Three airports service the Maryland/Washington Metropolitan area: Metropolitan area:



- **Ronald Reagan Washington National Airport (DCA):** 30 miles from facility; 37 minutes average drive time; \$80 average taxi fare.



- **Dulles International Airport (IAD):** 33 miles from facility; 34 minutes average drive time; \$80 average taxi fare.



- **Baltimore/Washington International Airport (BWI):** 40 miles from facility; 44 minutes average drive time; \$100 average taxi fare.

## NEBB Preferred Hotel

Attendees should make reservations directly with the hotel. NEBB's preferred hotel offers local negotiated room rates (Please note that hotel and transportation costs are not covered by the seminar registration fee.)

Hilton Garden Inn & Homewood Suite Rockville/Gaithersburg \*

14975 Shady Grove Road, Rockville, MD 20850

Phone: 240.399.7967

*\*Offers complimentary shuttle service within three-mile radius*

**Hotel Reservation Link:** [https://secure3.hilton.com/en\\_US/gi/reservation/book.htm?ctyhocn=DCARVGI&corporateCode=3143928&from=lnrlink](https://secure3.hilton.com/en_US/gi/reservation/book.htm?ctyhocn=DCARVGI&corporateCode=3143928&from=lnrlink)

# NEBB SOUND & VIBRATION SEMINAR REGISTRATION FORM

1. Pre-registration and payment of fees are necessary to ensure your participation in the seminar.
2. **Seminar Registration form & payment must reach the NEBB Office by Monday, September 25, 2017.**
3. Register: Online by using the Certelligence Portal at [www.nebb.org](http://www.nebb.org), or mail this form to: NEBB, 8575 Circle, Gaithersburg, MD 20877-4121
4. **Phone:** 301.977.3698      **Fax:** 301.977.9589      **Email:** [training@nebb.org](mailto:training@nebb.org)

Name \_\_\_\_\_ Date \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City, State, ZIP \_\_\_\_\_

Phone / Cell \_\_\_\_\_ Fax \_\_\_\_\_

Email \_\_\_\_\_ Chapter \_\_\_\_\_

Please list any dietary restrictions \_\_\_\_\_

## Seminar Fee (Check all that apply)

- \$800.00 Seminar Sound Measurement Registration Fee (*Sound Measurement Professional Exam requires separate fee.*)
- \$800.00 Seminar Vibration Registration Fee (*Vibration Measurement Professional Exam requires separate fee.*)

## Optional Study Materials / Publication Fees

- \$95 NEBB Procedural Standards for the Measurement of Sound and Vibration
- \$105 Sound and Vibration Design Analysis

\_\_\_\_\_ **\$ Total Amount Paid**  
(Prices for publications do not include shipping and handling.)

## Payment Method

- Check Enclosed made payable to NEBB
- Visa     MasterCard     American Express

Name on Card \_\_\_\_\_

CC Number \_\_\_\_\_

Expiration Date \_\_\_\_\_

Security code \_\_\_\_\_

Signature \_\_\_\_\_

## Cancellation Policy

*Cancellation by registrants, regardless of reason, will be subject to a \$250 service charge to cover NEBB's expenses. A refund of the prepaid registration will be made less the \$250 service charge.*

*No shows or late cancellations (those persons registered for the seminar who do not cancel 14 days prior to the seminar and subsequently do not attend the course) will forfeit the entire registration fee unless a replacement can be found.*

*NEBB reserves the right to cancel any seminars having insufficient registrants, in which case, all prepaid registration will be refunded in full. NEBB is not responsible for any losses resulting from cancellation of a seminar. Please advise NEBB and your hotel of your cancellation as soon as possible.*



# CERTIFICATION AND EXAM PROCESS: A STEPPED APPROACH

NEBB's Sound and Vibration Measurement Certified Professional certification program offers tangible proof that technicians are qualified in the proper sound and vibration measurement methods and procedures for testing building systems for optimum performance. NEBB's Sound and Vibration Measurement certification sets the testing standards of the knowledge, skills and abilities for the certification of CPs who perform these functions.

**Professionals who desire to achieve the Sound & Vibration Measurement Certified Professional certification and who want to sit for the exams are required to be in compliance with and complete all certification requirements, forms and processes BEFORE attending the seminar.**

Please begin your certification process well in advance.

1. Sound Measurement CP and Vibration Measurement CP certification requirements are available in the *NEBB Comprehensive Certification Handbook* available on the NEBB website at [www.nebb.org](http://www.nebb.org), or email [certification@nebb.org](mailto:certification@nebb.org).

2. To obtain SM or VM CP certification information, please email [certification@nebb.org](mailto:certification@nebb.org).

3. **Deadline for receipt of the SM CP or and VP CP Applications for Candidacy: Monday, September 25, 2017.**

- a. **Last minute applications or walk-ins to the exam will not be accepted.**

4. Pre-requisites must be met and the SM CP and VM CP Application for Candidacy must be submitted for approval and the certification application fees paid.

- a. Once approved, the Candidate will receive payment information for the SM CP and VM CP paper-based Written Exam.

## 5. SM CP Certification Fees

- a. The cost associated with the SM CP certification are as follows:
  - i. NEBB Affiliated/Non Affiliated non-refundable SM CP application fee: \$100.00
  - ii. NEBB SM CP Written Exam fee: \$340.00
  - iii. NEBB SM CP Practical Exam fee: \$400.00

- b. Once the Candidate passes all the exams, he/she is required to complete the Application for Certification to finalize the certification. Additional fees include:

- i. SM CP Certification: \$50.00
- ii. SM CP Certificate: \$30.00

## 6. VM CP Certification Fees

- a. The cost associated with the VM CP certification are as follows:

- i. NEBB Affiliated/Non Affiliated non-refundable VM CP application fee: \$100.00
- ii. NEBB VM CP Written Exam fee: \$340.00
- iii. NEBB VM Practical Exam fee: \$400.00

- b. Once the Candidate passes all the exams, he/she is required to complete the Application for Certification to finalize the certification.

Additional fees include:

- i. VM CP Certification: \$50.00
- ii. VM CP Certificate: \$30.00

7. Because a Candidate's exam results are entered into Kryterion, NEBB's online exam processing center, Candidates are required to set up a profile on Kryterion in advance of sitting for the SM CP and VM exams.

- a. Instructions on the process will be sent.
- b. No exam scores will be sent unless the Candidate's profile has been set up.

8. Those who wish to sit for the SM CP and VM CP exam must have all facets of the certification process completed and paid for prior to attending the S&V seminar and be an "Approved Candidate."

9. Success with certification comes with dedicated self-study and preparation. As such NEBB recommends that SM CP and VM CP Candidates refer to the Recommended Reading List found in their Candidate Handbook Appendices.



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