

# Testing, Adjusting, and Balancing (TAB) Technician Seminar

October 23<sup>rd</sup> – 25<sup>th</sup>, 2023

Monterey, CA

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## Location:

**Monterey Marriott Hotel**

350 Calle Principal

Monterey, CA 93940

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## This Seminar is Designed for:

- Entry-level professionals who are interested in advancing their knowledge in HVAC and TAB work considering an extensive review to enhance their technical education.
- Other Professionals interested in learning about TAB.
- Qualified Candidates for the NEBB TAB Certified Technician.

Registration Deadline:

**September 25, 2023**





## Our COVID-19 Response Plan

Considering COVID-19, NEBB has taken several proactive steps to help ensure the health and safety of our attendees and instructors. Precautions such as constant sanitization of the seminar area increased attention to high-touch areas in the rooms, limits on the number of attendees during the seminar, and protective gear for our Instructors are in place. NEBB also will be practicing social distancing and maintaining 6 feet apart. **NEBB follows local county recommendations.**

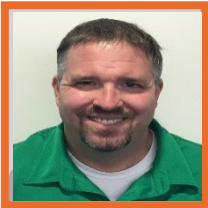
### Responsibilities for Each Attendee:

- If you are experiencing any symptoms of COVID-19 like running a fever, coughing or shortness of breath, please do not attend the seminar.
- You have been exposed to someone who has tested positive for COVID-19 in the last 14 days.
- You have a compromised immune system or are considered “high risk.”
- Masks are not required during the seminar but can be worn if desired.
- Sanitize hands prior to entering seminar location.
- Avoid shaking hands or engaging in any unnecessary physical contact.
- Signing a waiver prior to the seminar





## Seminar Instructors:



**Travis Short, PE**

Travis Short is a Lead Commissioning Specialist for Henderson Building Solutions a Nationwide Commissioning and Construction Management firm. Travis has 21+ years' experience and received his Bachelor of Science in Mechanical Engineering from the Missouri University of Science & Technology. Travis is a NEBB Certified Professional in both Building Systems Commissioning and Testing, Adjusting and Balancing of Environmental Systems. His capabilities range from large central utility plants to geothermal heat pump technologies and all mechanical system in-between. His advanced knowledge of Building Automation & Management Systems stems from the fact that he has designed, built, installed, and programmed various systems ranging from HVAC controls to PLC's. He is a published author with chapters in the following: "Web Based Energy Information and Control Systems" and "Web Based Enterprise Energy and Building Automation Systems."



**Brian Sharkey, NEBB CP, LEED AP**

Brian Sharkey has worked in the test and balance field since 1991. He began as a test and balance technician while attending the University of Texas in Arlington. After graduating in 1993, he formed his own TAB firm and worked as a NEBB Certified Professional and Operation's Manager. In 2018, Brian joined Airadigm Solutions in Denver, Colorado as the firm's Chief Training Officer and provides training, technical expertise, and support to regional offices and the national staff. Working in the industry for 30 years, Brian has tested and commissioned various environmental systems and designs. He is consistently working in the field to train but additionally to keep up with changes in the industry. Brian is a NEBB Certified Professional in Testing, Adjusting and Balancing of Environmental Systems, Sound Measurement, Vibration Measurement and Whole Building Technical Commissioning of New Construction.



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## About This Seminar:

Building owners and tenants are concerned that environmental performance of buildings must be optimal while operating costs should be minimal. These goals can only be accomplished when a building's HVAC and hydronic systems are properly balanced. Three major steps used to achieve the proper operation of the HVAC and hydronic systems and a desirable climate are testing, adjusting, and balancing (TAB).

### Formulas and Their Use

Formulas are used daily by a TAB professional and should be memorized and applied appropriately as needed. Formulas include ratios of speed vs volume vs pressure vs BHP for air and hydronic systems. Other formulas that become necessary on occasion include V-belt length, BTUH, sensible, latent, and total heat, and others. Attendees will receive a list of commonly used formulas for their use and application.

### Electricity

Attendees will re-familiarize themselves with single vs three phase systems, how to measure voltage and amperage, overload protection, calculation of brake horsepower and the need for using safe practices and safety equipment for protection while gathering necessary measurements.

### Fan Laws & Curves

Fan affinity laws will be covered, and attendees will review how to apply known data to fan curves. Instructors will discuss individual fan systems as well as fans in series and fans in parallel.

### Pump Laws & Curves

Pump affinity laws and how to apply known data to pump curves will be discussed and demonstrated. Individual pumping systems as well as open systems, closed systems, pumps in series and pumps in parallel and NPSH requirements will be covered.

### Air Systems

Various configurations of air systems such as supply, return and exhaust systems as well as constant volume, variable volume heat recovery, induction systems, active chill beam systems, and makeup air systems will be reviewed.

### Psychometrics

The use of a psychrometric chart as it applies to TAB and relates to the physical properties of air and the relationship of the properties to each other will be reviewed. Attendees will spend considerable time learning to plot psychrometric charts and understand the principles.

### Problem Solving

TAB Professionals identify problems and determine solutions or provide necessary information for responsible parties to address and correct the problem. This involves solid logic capabilities requiring the professional to exercise a systematic approach to the identification and resolution of problems or difficulties exposed by the TAB process.

### Engineering Fundamentals

The course will cover basic Heat Transfer and Fluid Mechanics as they relate to TAB.

### TAB Procedural Standards and TAB Reports

The course will cover the requirements of the NEBB TAB PS and will address what constitutes a NEBB TAB Certified Report.



*This Seminar has been approved for 20 Continued Education Credits*



## **Monday, October 23, 2023**

**(8 CECs)**

**7:00 am:** Registration

**7:30 am – 5:30 pm:** Heat & Heat Transfer, Fluid Mechanics and Psychometrics (*Lunch provided*)

## **Tuesday, October 24, 2023**

**(8 CECs)**

**7:30 am – 5:30 pm:** TAB Measurements, TAB Instruments, Electricity, Motors, Controls (*Lunch provided*)

## **Wednesday, October 25, 2023**

**(4 CECs)**

**7:30 am – 11:30 am:** TAB Mathematics, Fans, Fan System Relationships and Duct Systems

### **Optional Exam Day**

**12:30 pm:** Registration

**1:00 pm – 4:00 pm:** TAB CT Exam

*The scheduled activities subject to change depending on location, instructors, and other factors.*



## Travel Information:

We recommend all attendees that are unfamiliar with the seminar location or require travel from another location review the following information prior to registering for this seminar.

### Hotels:

Attendees can reservations directly with the hotel of their choice. Below is a short list of hotels near the training center. Hotel and transportation costs are not covered by the seminar registration fee.

#### Monterey Marriott Hotel

350 Calle Principal  
Monterey, CA 93940  
+1 831-649-4234

### Important Dates and Times:

#### Arrival in Monterey, CA

Sunday, October 22, 2023

#### Seminar Dates:

Monday - Wednesday, October 23- 25, 2023

#### Optional TAB CT Paper-based Exam

Wednesday, October 25, 2023

### Airport:

**Monterey Regional Airport (MRY):** serves the Monterey area. The hotel listed above is approximately 4 miles from the airport (about a minute drive). Taxi services are available at the airport.

### Seminar Location:

**Monterey Marriott Hotel**

350 Calle Principal

Monterey, CA 93940



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# NEBB OCT. TAB SEMINAR REGISTRATION FORM

**Registration form and payment must reach the NEBB office on or before September 25, 2023.**

Pre-registration and payment of fees are necessary to ensure your participation in the seminar.

Three ways to register:

1. Online through the [Certelligence Portal](#)
2. Email this form to [training@nebb.org](mailto:training@nebb.org), or
3. Mail this form to: NEBB, 8575 Grovemont Circle, Gaithersburg, MD 20877.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City, State, Zip: \_\_\_\_\_

Phone/Cell: \_\_\_\_\_

Email: \_\_\_\_\_

Please list any dietary restrictions and/or ADA accommodations:

\_\_\_\_\_

### Seminar Fees (Check all that apply)

- \$1200 Seminar Registration Fee  
(Does not include candidacy application or exam fees)

### Publication Fees

- \$95 NEBB/ \$125 Non-NEBB: NEBB Procedural Standard (Please indicate preference: hard copy or electronic)
- \$250 NEBB/ \$300 Non-NEBB: TAB Technical Manual (Please indicate preference: hard copy or electronic)
- \$200 NEBB/ \$250 Non-NEBB: Environmental Systems Technology
- \$245 NEBB/ \$350 Non-NEBB: TAB Home Study Course for CT's

*\*Prices for publications do not include shipping and handling.*

### Optional Exam Opportunity:

Please check the box below. If interested, please email [certification@nebb.org](mailto:certification@nebb.org) for the candidacy application process. Pre-approval and payment are required before the deadline.

Yes, interested in taking the exam.

No, not interested in taking the exam.

### Payment Method

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

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

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

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

Security Code \_\_\_\_\_

Signature \_\_\_\_\_

\$ \_\_\_\_\_ **Total Amount Due**

Note: Any candidacy or exam fees will be invoiced separately.

**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 who registered for the seminar who do not cancel at least 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 fees will be refunded in full. Please advise NEBB and your hotel of your cancellation as soon as possible.





## Attendee and Seminar Requirements:

1. Verifiable practical TAB experience.
2. Minimum working capability in mathematics, including geometry and second-year high school algebra.
3. Well versed in the application of mathematical formulas that are pertinent to TAB.
4. Possess a full working knowledge of the instruments required for certification by NEBB.
5. Possess full understanding of when, where, and how to use the instruments.
6. Attendees are required to bring the following to the seminar:
  - **Straight edge**
  - **Hand calculator (with square, square root, cube and cube root functions)**
  - **Pencils**
  - **Laptop/iPad to review course materials.**

## Recommended Publications:

To achieve the best learning results, it is highly recommended that attendees **read the following publications BEFORE** attending the seminar:

- NEBB Procedural Standards for Testing, Adjusting and Balancing of Environmental Systems
- Testing, Adjusting & Balancing Specifications (available for download at [www.nebb.org](http://www.nebb.org))

Instructor assumes that all attendees have a thorough working knowledge of the requirements of these NEBB publications prior to attending the seminar. Publications can be purchased online at [www.nebb.org](http://www.nebb.org).

## Important Reminders:

1. Registrations will be filled on a “first come-first served” basis. Please note that class sizes are limited due to Covid Social Distancing Protocol.
2. Seminar fees include course instruction, lunch, am/pm breaks.
3. Seminar fees do not include anything pertaining to certification.
4. For information on certification or exams please contact [certification@nebb.org](mailto:certification@nebb.org).

## Questions About This Seminar?

Call 301-977-3698 or email [training@nebb.org](mailto:training@nebb.org)

