Debunking the 70% Myth: Cut Scores and NEBB Exams

Over the past months, a consistent question I’ve encountered within NEBB focuses on exam passing scores. The belief is the passing score for all NEBB written certification exams is 70%.

While once true, no longer is that the case. Appropriately, that begs the following questions: “How, why and when was 70% selected as the standard exam score for NEBB written exams?” and “How are exam scores determined today?”

Uncovering the History Behind 70%

A bit of investigation uncovered one reason behind the rationale of setting 70% for NEBB exams. According to Jim Bochat, Commissioning Concepts, Past NEBB Board Chair and NEBB volunteer since 1975, “Back then, there was no scientific reason for the 70% other than leadership at the time thought that was what everyone strived for a passing grade.” However, in the educational realm, 70% equates to a C level which is a marginal passing grade and does not denote higher achievement.

“A C level is what they looked for back then, which was the minimum level for entrance into the program,” said Bochat. “In hindsight, arbitrarily setting a score is not really the correct method to evaluate an individual’s capability, especially since exam questions were not well vetted.”

Changing Times

Times change, as did how NEBB leadership viewed its certification ex-
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ams. The realization hit: to have an exam passing score determined properly, the exam questions had to go through a proper scientific review, complete with psychometric analysis and Angoff scoring. The cut score (passing score) then would come from the full analysis—specific to each exam and the quality of its questions.

In late 2013, leadership moved to upgrade the process used to create written exams. Their intention was not to make NEBB written exams harder, but to better evaluate the minimum level of capability to perform the work while increasing exam quality.

**The Angoff Scoring Method**

An exam’s passing score can’t be decided arbitrarily; it must be justified with empirical data, and the Angoff Scoring Method was employed by NEBB for that reason. In plain English, the Angoff Method is one of several methods test developers use to set a standard cut score (passing score) using empirical data and is a widely used standard-setting approach in test development. In 2014, NEBB’s Exam Writing Committee, working under the auspices of NEBB’s Certification Board, began conducting a thorough analysis of its exams. [Side note: Many NEBB exams have been recalibrated and in 2016 more are scheduled for review and analysis, with the ultimate goal of having all NEBB exams analyzed and cut scores adjusted.]

The process begins by creating, reviewing, analyzing and vetting exam questions with Subject Matter Experts (SMEs) in the discipline. After that is completed, the Angoff Scoring method is employed. Relying on the SMEs who examine the content of each exam question (item), the process then predicts how many minimally-qualified Candidates would answer the item correctly.

The average of the SMEs’ predictions for an exam question becomes its “predicted difficulty.” The sum of the “predicted difficulty values” for each item are averaged across the Exam Writing Committee and items on an exam, and that becomes the recommended Angoff cut score.

“The process is time-consuming but ultimately provides NEBB with better, high quality exams,” says Rick Farrington, NEBB Certification Vice Chair and past Exam Committee Chair.

**Real-world Example**

Let’s say an exam developer must determine the passing score for a language exam that tests a person’s ability to read French. Using the Angoff Method, the developer would employ a number of SMEs (in this case, French-language experts) and ensure they were properly trained on how to use the Angoff Method, as well as informed on the exam’s purpose.

The French-Angoff SME Committee would then rate each test item (question) based on whether or not a minimally qualified Candidate would answer the item correctly or incorrectly. Once the first round of ratings had been conducted, everyone on the Committee would be given access to the ratings of the other SMEs to compare how they scored a particular test item.

The SMEs would then rate the items again for a second round. This second rating gives SMEs the oppor-
portunity to review their initial rating of an item, and decide whether they might want to change their decision based on the expert judgments of the other SMEs. This second round of ratings would be averaged across the SMEs to determine the exam’s final cut score.

Says Stanley Fleischer, NEBB Certification Board Chair, “Using the Angoff Method ensures that the passing grade of an exam is determined empirically, which is necessary for an exam to be legally defensible and meet the Standards for Educational and Psychological Testing.”

Thus 70% is not the standard cut score for all NEBB exams, and moving ahead, exams will have different cut scores based off its Angoff score. This move will ultimately raise the level of professionalism and excellence for all NEBB Certificants - and the organization as a whole.

About the Author

Cynthia Hereth is NEBB’s Director of Certification and has been in the non-profit association world for 30 years, specializing in certification, training and leadership management.
(NEBB Disciplines are supported by volunteer experts in areas of specialized high building performance. Each group is committed to continued growth and keeping NEBB Certification programs the GOLD Technical Standard in each specialty.

**Building Enclosure Testing (BET) Committee**

*Phil Emory, Chairman*
Neudorfer Engineers, Inc.

The Building Enclosure Testing (BET) Committee has finally received some much needed help from NEBB volunteers. They recently held a seminar at the National Conference in Albuquerque and are looking forward to the addition of NEBB BET CPs. Always on the front lines of new information and regulations, The BET Committee keeps its eye on the global market and provides NEBB and the Marketing Committee insight and suggestions to improve NEBB BET CP status in the industry.

**Cleanroom Performance Testing (CPT) Committee**

*Patrick C. Law, Chairman*
Hepatext, Inc.

The Cleanroom Performance Testing (CPT) Committee has BETA tested their latest CP exam and made necessary improvements. The results are encouraging. They are looking into the possibility of holding a seminar/exam in Asia. The CPT is always on top of current trends and regulations. Last quarter they were on top of regulations for compounding environments, and now they’re making sure to keep current with recent changes to ISO-14644. They are incorporating that information into their Home Study Course as well as any necessary changes to the CPT Procedural Standards. This committee is outstanding at ensuring NEBB Professionals are at the forefront of the industry.

**Fume Hood Testing (FHT) Committee**

*Mike Kelly, Chairman*
Air Filtration Management, Inc.

The beginning of 2016 has proven to be a busy time of change and planning for the FHT Committee including a successful transition of leadership responsibilities between former committee chairman, Don Fedyk, to the new chairman, Mike Kelly. The FHT members would like to thank Don for his time and dedication in leading this committee and wish him well in his new role within NEBB.

In mid-March the committee conducted the first of two FHT CP seminars scheduled this year. Both located in Kansas City, MO. The next seminar will be held on September 19-23. Further details can be found at www.nebb.org.

Over the next three months, the FHT committee will be focused on three main goals:

- Continue to work on the second edition of the FHT Procedural Standard incorporating changes from ASHRAE-110.
- Update the FHT CP seminar presentation to coordinate and address the revised Procedural Standard.
- Search and identify additional corresponding volunteers to build upon the committee membership.

Lastly, any individuals interested in volunteering for the FHT committee should contact Mike Kelly or David Muggah. Their
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New Subject Matter Experts “All Aboard!”

NEBB’s Exam Development Committee, working under the auspices of NEBB’s Certification Board, announced the appointment of 10 Certified Professionals as Subject Matter Experts/Item Writers for the various certification exams offered by the association.

The newly-minted SMEs represent the first “class” of CPs who were actively recruited by the Exam Development Committee for the express purpose of writing exam questions and assisting with exam development. SMEs were recruited by referrals from NEBB leadership, open recruitment, and also with assistance of Chapter Directors. All SME Candidates underwent an interview process and attended three weeks of training conducted through Go-to-Meeting sessions, combined with practical, hands-on assignments.

“These professionals are a hard-working group, representing diversity in geographic locations throughout the US and in business types,” said Brian Keller, Exam Development Committee Chairperson. “It’s been exciting to see the growth of our volunteer base with the new SMEs, and to have such great talent to draw from is definitely a boon to the Certification Board and the Exam Committee.”

The new group of SMEs are currently hard at work, developing questions for the CxCT exam and refining a select group of questions for the TAB CP exam. All questions will then be vetted by the Exam Development Committee prior to being added to the exam.

“I am honored to have been selected as an SME and look forward to helping NEBB grow in the upcoming years,” stated Nicholas Muscolino, LEED AP, Operations Manager, AERO BUILDING SOLUTIONS.

NEBB’s new SMEs are as follows:

Mark Andrews,
TAB CP, BSC CP, Rcx CP
Andrews, Hammock & Powell, Inc.
Macon, GA

Ryan Chang,
TAB CP, BSC CP, BET CP
TAB Engineers, LLC
Kaneohe, HI
Brent Hahn  
TAB CP, BCS CP, BET CP  
Pacific Test & Balance, Inc.  
Aiea, HI

Richard Jarvis  
TAB CP, BSC CP, Rcx CP  
Precision Air and Water  
Kalispell, MT

Ron Landberg  
TAB CP, BET CP, Rcx CP  
MacDonald-Miller Facility Solutions  
Seattle, WA

John Mazza  
TAB CP, BSC CP  
Airpath  
Hauppauge, NY

Nicholas Muscolino  
TAB CP  
Aero Testing and Balancing  
Franklin Park, IL

Mark Rusnock  
TAB CP, BSC CP  
Precision Air Balance, Inc.,  
Cape Coral, FL

Curtis Smart  
TAB CP, BSC CP, S&V CP  
Thermal Systems Balancing Inc.  
Melbourne, FL

Dave Wood  
TAB CP, BSC CP, S&V CP  
Fisher Balancing Company  
Williamstown, NJ
PRESIDENT’S MESSAGE

A few months ago we had our annual meeting and changes seem to be the underlying word of the event. As our industry grows, so does the regulations and standards. Our ANSI accreditation is changing us on a global level and California Title 24 changes was the hot local subject. Our annual meeting in Albuquerque, NM was a lot of fun with an overabundance of information. The annual meeting had a new theme with three tracks of information daily (1-BSC/TAB Topics, 2-BET/CPT Topics and 2-Business Topics). This change offered 50% more seminars which allowed plenty to choose from. As usual, each topic track offered many educational opportunities.

The ANSI changes require our different discipline committees to split into a testing & standards group. All the groups were busy several days before the general meeting working on updating their standards and having discipline specific training. The following are summaries from their reports:

- **BET** – Trained 10 new people. There is a nice change of younger faces as this discipline grows.
- **BSC** - Finished a new Technician training program. Working on fall training for techicianss in BSC & Retro. Starting on BSC standard with focus on the technician content.
- **Cert Board** – TAB CT Exam in its final stages and anticipated this summer. TAB CP exam is next for review.
- **CxPP** – Working on ANSI accreditation and roll out expected 12/2016 for federal requirement.
- **TAB** – Standards were updated and up for final review.
- **CPT** – Webinar on changes is in process and plans to come out this year.
- **S&V** – Standards are in an updating process. Standardizing for the industry standards. Finalizing a home study course by the end of the year.
- **FHT** - Standards are being updated.
- **Marketing** – Magazine improvements are in progress. Hoping to get SME articles. Also working on brochure.

All the reports brought up a fairly new term – SME – Subject Matter Experts. There are many new systems and equipment that exceeds the capacity of a disciplines standard. NEBB is looking for SME’s to help write white papers on your experience. There are many local or new systems that need your input like new evaporative cooler AHU, unique thermal storage, VRF, etc. This could help you with your CEU also. In addition, the committees need your help creating the Body of Knowledge for the updated standards.

CEC was a subject that bounced around the meeting. Presently we require 12 CEC every two years for CP and 6 CEC every two years for technicians. There is new guideline for the CEC that was shared with all our
chapters and should have been shared with you already. You will notice that one of the CP options is writing an article. Most CP and firms have expressed concern about the approved training and travel to the training. NEBB disciplines are looking into our options but the article option requires no travel. The article has a limitation though but used with the other CEC, opens options for our members. I recommend you look into the Technician requirements in particular as they are not as familiar to you as the CP. Stay ahead on the technician training as this requirement will sneak up on you for your companies re-certification. The technician CEC is focusing on keeping all our technicians up to speed with our industry needs. Note that 50% of the CEC must be NEBB approved programs.

Another interesting subject brought up was the expansion of our industry into markets outside of areas with strong NEBB representation, like the US, Canada and Australia. The demand is growing as our standards are well respected. NEBB is looking into the enforcement process of our standards in new markets. This will increase the review of all our standards locally also. We have received feedback at our chapter about our own members which shows the level of review that is occurring.

There were two business speakers that brought out subject matters that I wanted to share. One speaker spoke on the DISC communication principle. I have heard of many success stories of the value that DISC training has brought to companies. Search the web sometime and think about bringing it to your company. Your employees that speak directly to your clients will really benefit from this training as engaged employees are 26% more productive.

The last speaker (Leonard Greenberger) shared some client communication points but one stuck more than others: “Make sure they know you care before they care what you know”. Most CP’s are type A personalities and this statement will go a long way.

Hope we will see you next year in Orlando, Florida. You are NEBB and NEBB needs you. We hope you make time to share your knowledge and experience with us at the 2017 National Meeting.

Steven G Smith
2016 NorCal Hawaii NEBB Chapter President.
Upcoming Events

NEBB RC\textsubscript{X} SEMINAR AND OPTIONAL RC\textsubscript{X} CP EXAM

September 26, 2016—September 29, 2016
All Day Event
Gaithersburg, MD
Contact the NEBB Office to sign up or to receive more information at
www.nocalhawaiinebb.org

NEBB BUILDING SYSTEMS COMMISSIONING (BSC) TESTING TECHNI-
CIAN SEMINAR AND OPTIONAL EXAM

October 6, 2016—October 8, 2016
All Day Event
St. Paul, MN
Contact the NEBB Office to sign up or to receive more information at www.nocalhawaiinebb.org

NEBB FUME HOOD TESTING SEMINAR AND OPTIONAL EXAM FOR
CERTIFIED PROFESSIONALS

October 10, 2016—October 13, 2016
Kansas City, MO
Contact the NEBB Office to sign up or to receive more information at www.nebb.org

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For More Training Information visit www.nebb.org.