Mass Flow Compensation in Room Pressure Controlled Environments

Recently on a Biopharmaceutical project we were asked to troubleshoot fluctuating room differential pressure issues.

The background was a 15 year old facility constructed specifically for large scale Biopharma production. Approximately 250,000 square feet and approximately 100 pressure differential monitored rooms. In most rooms the supply air is controlled by an airflow station with feedback to a building automation system which in turn was set to maintain constant volume airflow. The return air was similarly controlled.

The issue plaguing the facility over the past 15 years was that of intermittent room differential pressures that fluctuated up and down randomly. Airflow trending was set up within the BAS (Building Automation System) and resulted in very stable airflows for both the supply and return. Room differential pressures were independently monitored and the results agreed with permanently mounted devices that the room DP’s were actually fluctuating when airflow trends indicated no change in airflow. The room envelopes were investigated and found to be reasonably air tight with very little exfiltration or infiltration.

After setting up additional trend information a common link was found between the room temperature and the pressure issues. It appeared that as the zone supply air temperature increased or decreased dramatically the room pressure experienced an increase or decrease in pressure. It was found that the airflow station was of a “hotwire” type of technology and by default also compensated for mass flow changes with the temperatures measured at the sensor array prior to the airflow volume output signal. These airflow stations in some situations were mounted directly...
downstream of the zone reheat coils and subject to temperature swings as the reheat coil control valve modulated to obtain the room temperature set point.

As the mass flow compensated supply airflow was discharged into the room its mass then changed to that of the room temperature. The room pressure fluctuations were directly caused by the mass flow compensation feature of the airflow stations, and could be seen by small changes in the zone supply damper position but with no airflow change indicated on the BAS but could be seen by Pitot Traverse.

The manufacturer of these devices was contacted and they were very helpful in providing a permanent solution to the problem by offering new hardware versions developed directly to resolve this problem at no cost to the building owner. The new hardware now has the option to enable or disable mass flow compensation as part of the hardware configuration.

With the mass flow compensation disabled velocities at the sensor array are maintained regardless of the change in mass flow due to temperature changes by reheat valve modulation, and room pressures are now stable. This solution avoided the relocation of the airflow sensor arrays from downstream to upstream of the zone reheat coils, which still may have been problematic due to supply air temperature fluctuations in the discharge air of the air handlers due to supply air temp reset strategies.

In the end the customer was able to resolve a long term issue without a large mechanical system retrofit in a very economical manner by calling for the services of a qualified NEBB Certified TAB Firm.

Curtis Worley is a NEBB Certified Professional with Pacific Test & Balance, Inc. located in Fairfield, California.
Congratulations!

Our Chapter’s newest NEBB Certified Professionals:

Brad Nolte, Jr.  
Therma

Davis Nguyen  
Air Balance Hawaii
Registration is now open for the 2017 NEBB Annual Conference in Orlando, Florida. The conference will be held at Hilton Lake Buena Vista @ Walt Disney World Resort on March 30 - April 1, 2017. This year’s theme is The Science of Buildings: Operations, Performance and Testing.

Set amid 23 beautifully landscaped acres, The Hilton Orlando Lake Buena Vista is within walking distance to Disney Springs™, which features an eclectic mix of unique boutiques, one-of-a-kind eateries and jaw-dropping entertainment. There are four fascinating neighborhoods filled with so much to discover:

- **The Landing** – A tasty waterside district absolutely overflowing with spectacular flavors.
- **Town Center** – Unique boutiques, one-of-a-kind flagship stores and a playful promenade that lets you relax, refresh and reconnect.
- **Marketplace** – From crystal glass coaches to sportswear with a Disney flair, this is one of the most hip Disney shopping experiences around.
- **West Side** – Ignite your senses with the sound of applause for world-renowned shows and the tempting aroma of treats to be discovered.

In addition, the hotel offers complimentary transportation to and from all Walt Disney World® Theme Parks, including: Magic Kingdom® Park, Disney's Animal Kingdom® Theme Park, Epcot®, and Disney’s Hollywood Studios®.

The conference will be kicked off by Opening Speaker Robert Stevenson who has over 30 years of experience teaching companies how to deal with risk, competition, and the ever-changing business environment. Technical sessions will abound throughout the conference which will be topped off by words of wisdom on the Millennial Generation from Closing Speaker Ryan Jenkins.

Log onto [www.nebb.org](http://www.nebb.org) to register for the conference and your hotel room. Check out all the sessions being offered.

**General Information:**

Schedule: The NEBB Annual Conference and Committee week kicks off with various NEBB Committee meetings on Tuesday, March 28. The official NEBB Annual Conference will start on Thursday, March, 30 at 5:30 p.m. with the Opening Session followed by the "Get Acquainted Reception."

Hotel reservations: NEBB has secured rooms at the Hilton Orlando Lake Buena Vista. The hotel rooms at the meeting hotel are discounted for attendees ($189); please be sure to ask for the NEBB room block when reserving.

Hotel reservation deadline is March 3, 2017.
2017 NEBB Annual Conference
Orlando, Florida
Hilton Lake Buena Vista • March 30 - April 1, 2017

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Plan Ahead: Exams in Orlando

At the 2017 NEBB Annual Conference in Orlando, Florida, NEBB’s Certification Department will offer pre-approved Candidates the opportunity to sit for various written exams and/or written practical exams.

If you’ve been thinking of pursuing certification in a specific discipline, or are halfway completed with the process, please plan ahead to ensure you are accepted into the certification program and have ample time to study and prepare for your specific exam.

1. Exams will be held Wednesday, March 29, 2017, from 8:00 am to 5:00 pm.
2. Exam Sign-in is from 7:00 am to 7:45 am.
3. Exams will be proctored by NEBB Staff.
4. A complete listing of exams offered for testing will be listed at www.nebb.org in the near future.
5. Exams will be offered for both the Certified Professional and Certified Technician.
6. Retests can be scheduled as well, if within the appropriate time frame.
7. Only candidates who have been pre-approved and have submitted exam paperwork and paid for the exam may sit for an exam in Orlando.
8. Exam walk-ins will not be accepted or processed onsite in Orlando.

Items of Importance

Pre-requisite requirements specific to each certification discipline must be met before submitting the Application for Candidacy.

The Application for Candidacy, along with appropriate documentation can be emailed to certification@nebb.org on or before February 28, 2017 in order to be designated an approved Candidate.

Candidates are allowed to retest after the 90-day waiting period
Leave the ladder behind!

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Kanomax USA, Inc.
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PRESIDENT’S MESSAGE

What a way to start a year? I wanted to say like a storm but that would of been too cliche’. But what a crazy year already!!!! Besides the weather and politics, work appears to have taken off. Today, the DOW went past 20,000 and the White House is talking to the companies and the trades this week. Looking across NorCal and Hawaii, many construction cranes are up and the work phone ringing off the hook. Let’s hope that continues through out the year.

Let’s say the work keeps going the way the year started, how are you going to address your growth? The NEBB conference is a great place to keep your companies, Certified Professionals (CP’s) and Certified Technicians (CT’s) sharp and up to speed with the industry changes. Our NEBB Conferences have had a different flavor in the training sessions with 2 technical and 1 business path. This way you can focus on your interest better and get training that addresses several sides of your company. This year the conference is in Orlando, Florida, March 30 - April 1. Hope to see you there.

Where are you, your company and technicians going? What is the next chapter with your business? Do you have anyone retiring in the next 5-10 years or do you plan to grow? How are you preparing for those changes? Several of us were talking last week and commenting on all the industry changes over our careers. Are you or your company ready? Get involved. Get your leadership involved. Or get your next generation involved. There is an endless amount of places to start. Start with the NEBB website. Explore and I am sure you will find something you did not know before, like the 8 pages of formulas with a great psych chart or whom is working in your area or the webinars available to you. Be prepared and build your next team member.

FYI - Our 2017 Northern California/Hawaii NEBB Annual meeting will be taking place on Monday, September 11, 2017 at the Springhill Suites in Napa. Mark your calendars and plan on attending. Registration will be sent out at the beginning of the summer.

Steven G Smith
NorCal Hawaii NEBB Chapter President.
Upcoming Events

NEBB BUILDING ENCLOSURE TESTING (BET) SEMINAR
March 27-28, 2017, Monday - Tuesday
All Day Event
Orlando, Florida
Registration Deadline March 13th. Contact the NEBB Office to sign up or to receive more information at www.nocalhawaiinebb.org

NEBB 2017 ANNUAL CONFERENCE
March 30 - April 1, 2017, Thursday - Saturday
Orlando, Florida
Registration is now open. Log onto www.nebb.org to sign up or to receive more information.

NORTHERN CALIFORNIA/HAWAII NEBB 2017 ANNUAL CONFERENCE
September 11, 2017, Monday
Springhill Suite
Napa, CA
More information will be published in June 2017.

NEBB WEBINARS AND EDUCATIONAL SEMINARS
For more Training and Educational seminars and Information, visit www.nebb.org.

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