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January 11, 2019

Mr. Christian Toro
Vice President of Maintenance & Engineering
Allegiant Air
1201 N. Town Center Drive
Las Vegas, NV 89144

Dear Mr. Toro:

We are writing on behalf of the Transport Workers Union of America, AFL-CIO (TWU), which represents more than 140,000 members across the country, including thousands of flight attendants employed by Southwest Airlines, JetBlue Airlines, Allegiant Airlines and Atlas Air.

We commend Allegiant for taking the complaints our members have made regarding odor events seriously enough to provide an action plan. It's come to our attention that you sent a message to our membership concerning what you describe as "fume odor." However, in reality, they are "bleed air issues." Allow us to explain.

- The action plan is divided into *Completed*, *Current* and *Ongoing* actions, which implies Allegiant has completed actions that should (in all actuality) be ongoing and continuous and not one-time fixes. Is this an example of inadvertent vagueness or a deliberate smoke-and-mirror tactic?
- In another deceptive use of words, you address only "odor" issues, which are basically cosmetic in nature rather than more serious bleed air issues. Bleed air issues are not necessarily associated with an odor. The release of carbon monoxide which has been well documented in the scientific literature, is odorless as is some fumes released when engine oil or hydraulic fluids contaminate cabin air supplies. It is only under extreme failure conditions that this is also associated with smoke in the cabin.
- The European Aviation Safety Agency (EASA)-sponsored study you quote is based on data from only 177 flights. However, according to another cabin air quality study¹ the frequencies of actual bleed air events range from 0.09

¹ National Academy of Sciences (NAS) 2002, Shehadi, 2016

to 1.29 incidents per 1,000 flight cycles, depending on the type of aircraft and maintenance procedures. To expect to encounter a bleed air event by monitoring just 177 flights is highly unrealistic. EASA has since realized the shortcoming of its original study and currently has sponsored a major study for the European Commission called the EASA FACTS project that will supersede the original study's findings.

- You also refer to studies dealing with the neurotoxic effects of oral consumption of the Tricresyl phosphate through ingestion of jet engine oils². It is a basic, and long standing, fact of toxicology that *inhalation* exposure of an agent is far more toxic than oral exposure³. So, unless Allegiant Air is planning to make jet engine oil, containing TCPs, part of the inflight service, this reference is completely irrelevant and indicates a lack of understanding and comprehension of the problem that the TWU is trying to address.

The real task at hand, is to identify the toxicity of the combined *inhalation* exposure from ALL the ingredients in jet engine oils. This also includes all the potential pyrolysis (super heating of engine oils) products, which includes among other things, carbon monoxide and formaldehyde.

In general, the “action plan” is rather meaningless unless there is a parallel air quality surveillance plan coupled with sensing and filtration of cabin bleed air. Such a plan will provide both protections to aircraft occupants and essential feedback to pilots, mechanics and operators concerning when an event is indicative of a benign odor vs. a more serious fume (bleed air) event. This would be the only way to identify when an actual fume (bleed air) event is occurring, what immediate actions need to happen in-flight and what the effect of each of the proactive mitigations has on the air quality within the aircraft.

The TWU has formed a Cabin Air Quality Task-force (CAQT) made up of Safety and Health subject matter experts from multiple divisions within the TWU, as well as, employing outside academic and research experts. The CAQT has been tasked with analyzing the cabin air quality issue on multiple fronts for the purpose of formulating mitigation strategies to combat this serious safety of flight and health matter.

The TWU is also part of Airlines for America, a trade association dedicated to creating guidelines to ensure the safety and well-being of airline passengers and

² Mackerer et al 1999

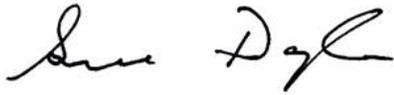
³ Caserett and Douell's Toxicology, the Basic Science of Poisons.1991 Pergamon press

workers. Airlines for America has already built their own working group to mitigate these air bleed issues.

The TWU International is invested in ensuring the utmost safety of flight attendants, and airline passengers, and we know Allegiant Air is, as well. The absence of an air quality plan is the equivalent of sailing a boat without a rudder.

We look forward to working with you to rectify this issue.

Sincerely,

A handwritten signature in black ink, appearing to read "Sean Doyle". The signature is fluid and cursive, with the first name "Sean" and the last name "Doyle" clearly distinguishable.

Sean Doyle

TWU International Safety Coordinator

A handwritten signature in black ink, appearing to read "Joseph Mayfield". The signature is cursive and somewhat stylized, with the first name "Joseph" and the last name "Mayfield" clearly distinguishable.

C: Joseph Mayfield, TWU Local 577 President