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**From:** Bates, George  
**To:** Imada, Brian T; Hamamoto, Eileen E; DeJager, Alan; Fay, Dennis M  
**CC:** Loukusa, Steven M; Johnson, Richard A  
**Sent:** 10/26/2007 3:10:35 PM  
**Subject:** RE: Toxicity??

No, I have not been signing for Toxicity other than to make sure my parts have MI numbers. Hydraulic Mist is another toxic product I refuse to get involved with even though our recirc filters have the capability to coalesce the mist. Further, the situation has not changed from what Brian has described.

I will add the Propulsion folks do not account or certify the bleed air quality they feed to us. For the 747-8, John Klym was the most recent to try to get the Propulsion folks to step up to owning their system by-products. All he got was the run around like I got in 2000 for the 767-400. Pratt & Whitney has some guarantees in their spec but GE and Rolls Royce engine specs do not mention bleed air quality when it comes to CO/CO2 or Hydrocarbon by-products. The Engine Specs are the hole no one has addressed.

Given the number of COSP events for the 757 / RB211-535C & -535E engines resulting from failed Fan and Forward IPC Bearing Oil Seals allowing oil by-products in the bleed ducts, I would have thought the FAA would have forced the issue. With all diversions (about 1 every 2 weeks) and Return to Base events due to Haze in the Cabin, I would have thought the FAA would have made the Engine Manufacturers address this by now. Some of the 757 events have been pretty significant in that the crew reported blue smoke with defined waves in the smoke. The visibility was limited so that the attendants in the aft galley could not see to the mid cabin over-wing exits. This is more than a light haze that we debate endlessly about for smoke evacuation. Who knows what the by-products are in hot synthetic Turbine Oil. The Material Data Sheet has warnings about skin contact and breathing the fumes of the oil, let alone the complication of partial combustion products.

The 767 / GE CF6-80A and 747 / GE CF6-80E airplane and engine combinations are better than Rolls Royce as far as frequency, but it still happens. The thing to note is the wide body events are no where as severe or dense as the 757 has experienced. The common theme is these are mostly old engines more than 15 years old. While SACO has informally discussed with me the widebody events, the thing I took away from the FAA/SACO discussion is the New England FAA is not interested in following up or supporting SACO on these events that are generally resulting from out of production engines. Bottom line is I think we are looking for a tombstone before anyone with any horsepower is going to take interest.

Thank you,  
George Bates  
Boeing Environmental Controls  
Wide Body Lav/Galley Vent, Cargo Cond / 767 Air Dist Cert  
Office Phone: (425) 294-6996  
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M/S OT-29

-----Original Message-----

**From:** Imada, Brian T  
**Sent:** Friday, October 26, 2007 10:54 AM  
**To:** Hamamoto, Eileen E; DeJager, Alan; Fay, Dennis M; Bates, George  
**Cc:** Loukusa, Steven M; Johnson, Richard A  
**Subject:** RE: Toxicity??

We specifically limited the coverage for failures & malfunctions to our equipment & systems. It didn't look like we had any wording for normal operation -- this should be added to limit your approval, unless you want to be approving the high pressure equipment & ducting. Like I said previously, this appears to be a hole in compliance coverage.

For Section 25.831(c) in the 767-400ER certification plan included this statement:

"Failures or malfunctions of air distribution systems or components will be analyzed by FHA (Section 3.0, Table 2). Further analyses (FMEA, etc) will be conducted as necessary to show

that (b) is met for reasonably probable failures."

The 767-400ER SDD included this statement:

"Failure mode and effects analyses (FMEA) are included in this document (table 3.1) to show that conditions prescribed in paragraph (b) are met for reasonably probable failures of the air distribution systems and aft E/E cooling system."

-----Original Message-----

From: Hamamoto, Eileen E  
Sent: Fri 10/26/2007 10:28 AM  
To: Imada, Brian T; DeJager, Alan; Fay, Dennis M; Bates, George  
Cc: Loukusa, Steven M; Johnson, Richard A  
Subject: RE: Toxicity??

I agree with Brian on coverage and sign-offs. Brian, did you add the statement about only covering Air Distribution parts in the system description document. I have not done that before.

Thanks,

Eileen Hamamoto  
Environmental Control Systems  
Lead, 777 Air Distribution  
(425) 717-6427 M/S OT-34  
(425) 631-1045 pager

-----Original Message-----

From: Imada, Brian T  
Sent: Friday, October 26, 2007 9:49 AM  
To: DeJager, Alan; Fay, Dennis M; Hamamoto, Eileen E; Bates, George  
Cc: Loukusa, Steven M; Johnson, Richard A  
Subject: RE: Toxicity??

If you're referring to electrical equipment smoke, this is covered by 14 CFR, Section 25.869(a). Even though this regulation points to Section 25.831(c), historically, our DER's/AR's haven't been signing for this equipment. This was extensively covered back in the late 1990's cumulating with a DER hotline and a letter to the FAA. These documents are on the MORDAC server, under "Certification" folder, under "Equipment Smoke" folder. This assigned responsibility for electrical equipment smoke to the equipment owners (which I understand now to have fallen on the Electrical & Electrical Subsystems designees). We worked this to ensure that ECS didn't get stuck as the "police" for all of the electrical equipment in the airplane, particularly the IFE.

With regards to material toxicity in ECS parts & equipment, Boeing has material toxicity requirements (managed by M&PT which they provide oversight). I've always assumed that our designees approve this for the ECS parts, but it is covered by process. This would cover normal offgassing & reasonably probable failure conditions for Section 25.831(c) & less probable failure conditions under Section 25.1309(b).

What is odd is that FAA imposes smoke penetration from the non-cargo compartments (E/E bay, crew rests, galleys) via Section 25.831(c), even though the smoke is not a reasonably probable failure (~10E-7 event).

One issue that seems to come up is what equipment do the Air Distribution designees approve for Section 25.831(b), (c) for the "hazardous concentrations" requirement. On the 767-400ER, I put specifically, that our approvals were only for air distribution system equipment (plus the overall airplane CO/CO2 concentration). Any contaminants added by upstream equipment (e.g., packs, bleed) were covered by those DER's). I know the CACTCS DER claimed their equipment didn't offgas or have any reasonably probable failures that could generate smoke or hazardous gases, so they didn't include this regulation. It is not clear to me whether this is a "hole" in the DER/AR coverage for the ECS equipment in the airplane (such as the air supply).

Of course, I don't get as much visibility of these issues as I'm not an AR, so some of this may have changed. You may want to query the ECS SAW/AR Advisor.

BTI

-----Original Message-----

From: DeJager, Alan

Sent: Fri 10/26/2007 8:54 AM

To: Imada, Brian T; Fay, Dennis M; Hamamoto, Eileen E; Bates, George

Subject: Toxicity??

Do any of you in your minds include Toxicity when you're signing for 25.831(b)? I have to say I haven't. I've always thought of Toxicity as an Electrical requirement.

Alan