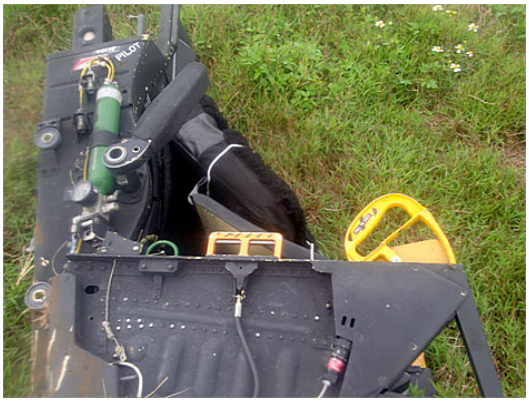
NEWSLETTER

BURNING COMPOSITE AIRCRAFT PRODUCE A LOT OF (TOXIC) SMOKE AND THIS ONE THAT CRASHED ON GUAM TOOK 6.5 HOURS AND 65,000 GALLONS OF WATER TO EXTINGUISH!

COMPOSITE AIRCRAFT HAVE CERTAIN ADVANTAGES, BUT ARE THEY WORTH THE HAZARDS THEY INTRODUCE? FIRE, SMOKE AND TOXICITY. THE FAA APPEARS TO TREAT THESE HAZARDS LIGHTLY, BUT SHOULD THEY RECONSIDER APPROVING CARBON FIBRE - EPOXY RESIN MATERIAL?



THE AIRCRAFT STALLED ON TAKEOFF DUE TO A MALFUNCTIONING AIRSPEED INDICATING SYSTEM . . . The two pilots ejected frm the aircraft and only suffered minor injuries. The two persons, sex unknown, are wearing *HAZMAT* protective suits because of the toxicity of the "crash atmosphere"! (One of the two ejection seats is shown here.) **NOTE: Composite aircaft accidents are surviveable - if all the occupants have low level ejection seats, quick opening parachutes and avoid the smoke!**.

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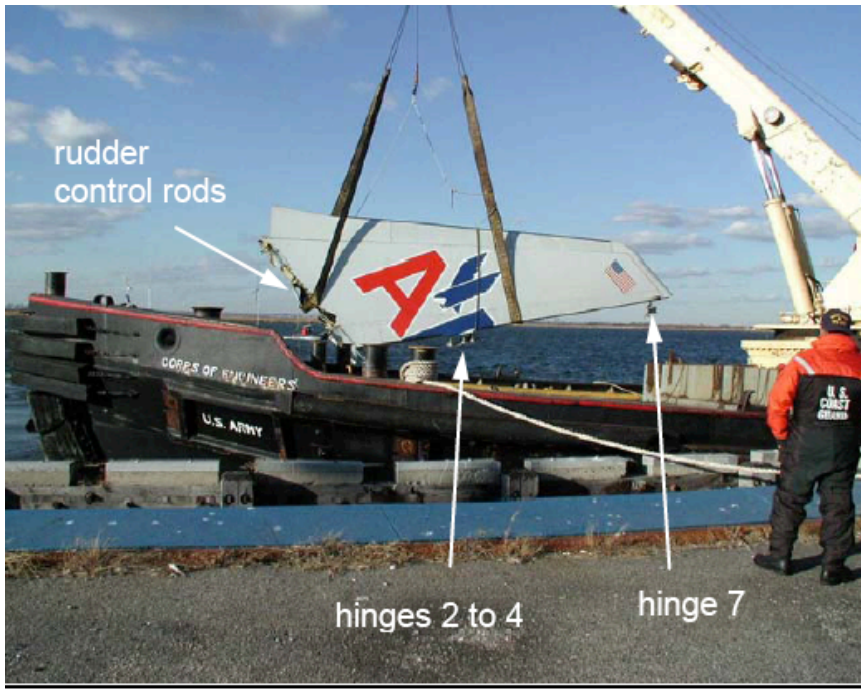
WE EXPECTED THE FAA's Boeing 787 AIRCRAFT SPECIAL CONDITIONS to address past problems with COMPOSITES - (like the A-310 fin failure at JFK). **NOTE:** SPECIAL CONDITIONS are issued in accordance with *14CFR §21.16 - If the Administrator finds that the airworthiness regulations of this subchapter do not contain adequate or appropriate safety standards for an aircraft, aircraft engine, or propeller because of a novel or unusual design feature of the aircraft, aircraft engine or propeller, he prescribes special conditions and amendments thereto for the product. The special conditions are issued in accordance with Part 11 of this chapter and contain such safety standards for the aircraft, aircraft engine or propeller as the Administrator finds necessary to establish a level of safety equivalent to that established in the regulations.)*



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Two experienced engineers - each with more than twenty years of Composite Materials experience (Lockheed and Boeing) submitted comments to the NPRM. It was their comments that caused us to investigate the SAFETY OF COMPOSITES IN PASSENGER AIRPLANES! Their comments and the FAA' s response will be the subject of the next NEWSLETTER, but as an Aviation Safety Specialist at the Scottsdale FSDO used to say . . . *Jim, I'm not very comfortable with that* - meaning he didn't think my solution to a problem would cover all the regulatory requirements. **Well, I'm not comfortable at all,** but let's look at the FAA document that is supposed to address the problem both the experts were concerned about - a low speed takeoff or landing accident - usually surviveable in a "tin airplane" - spilled fuel - and holes in the fuselage. But before

The FAA's *recommended practice* for burnthrough protection is -- Advisory Circulair 25.856.2A - *INSTALLATION OF THERMAL/ACOUSTIC INSULATIION FOR BURNTHROUGH PROTECTION.* (To protect the folks inside the airplane

"6. EXPLANATION OF TERMS.

a. Burnthrough. The penetration of an external fire into the airplane cabin, typically through the airplane skin, insulation, and sidewall or floor structure. For the purposes of the test, a breach of 0.25" or more in diameter is considered burnthrough.

b. Overlap. The length of insulation material that presents a double thickness of material either against the airplane skin, for the purposes of joining two bags, or abutting airframe structure other than the fuselage skin (see figure 1).

c. Pool Fire. An extensive ground fire originating from fuel spillage from damaged airplane fuel tanks.

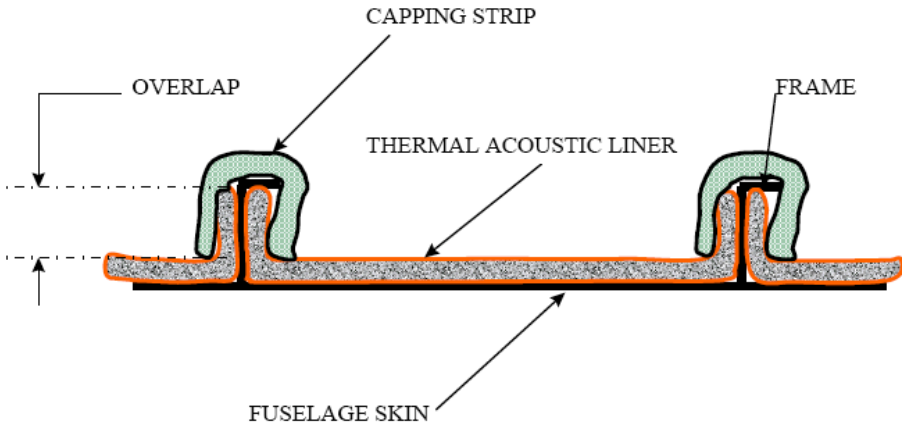
d. Thermal/Acoustic Liner. Any materials (for example, a blanket) that are used to thermally or acoustically insulate the interior of the airplane. These materials are typically installed onto the airplane skin or other structure and can form a barrier between the passenger cabin and an external fire. Thermal/acoustic liners consisting of batting encapsulated by a moisture barrier may be known as "bags."

e. Field Blanket: Thermal/acoustic liner positioned between structural members (frames, for example) and typically fastened on the liner's periphery

f. Lower Half: The area of the fuselage below the horizontal line that bisects the cross section of the fuselage. This may be determined using the height of the fuselage as a basis."

Do you think this is a valid solution?

Figure 1. Overlap



THE WORD *COMPOSITES* DOES NOT APPEAR IN THE AIRWORTHINESS STANDARDS FOR TRANSPORT CATEGORY AIRCRAFT - PART 25 . . . BUT IT DOES IN THE THREE OTHER AIRWORTHINESS STANDARDS (Part 23 Normal . . . and both helicopter Parts - 27 & 29). If you want the "official words" on FIRE, SMOKE AND TOXICITY you have to *google* FAA's Atlantic City Research Facility - *Home of the Fire Safety Branch.* If you read the "stuf" they have prepared for "fire fighters" - the dangers of composite fires - you wouldn't want to be near a burning composite airplane. Yes, an innocent overheated brake on a *Cirrus* light plane can "melt" the wing and . . . . .Cirrus uses wet wings rather than an aluminum fuel tank tucked inside the wing. So any crack in the plastic from an accident turns into a fuel leak, and the planes have had a tendency to catch on fire after crashing. By the way, you don't have to *crash a Cirrus* to melt the wing . . . .remember, a simple brake fire will do it! More on *simple wheel fires and the Australian Aircraft Fire Fighting Proceures in the next NEWSLETTER.*

THIS IS A NEW AIRBUS A340-600 - NO FLIGHT TIME. The operator's flight crew decided they wanted to do an engine run! All four at take-off power, when - "oh shoot". It collided with the blast fence! **Fragile isn't it**? Would the *new insulation blankets* keep the smoke and flames out of the cockpit?

The buyer's flight crew decided to "practice" engine runs. They set the parking brake, started 'em and attempted to take all four engines to takeoff power. No luck, the aircraft wasn't configured (flaps set, etc.) for take off. Oh, pull the landing gear *in flight sensor* circuit breaker to simulate "airborne" . . . . Bam - bang - oh $%it, it hit the blast fence. Send me an e-mail (jim@tatsco.com) for the *"rest of the story"* photos.

QUESTION? If you can't take Legal Action against the FAA if they certify a *LEMON* (see *re Varig)* because they used their *discretionary authority,* why does the FAA penalize an operator (SOUTHWEST) when they use their *discretion* in establishing when and how often they perfom an A/D action? Over 100 passengers died *in Varig*. Only one person died because of a **defective fuselage lap joint failure** (*in Aloha)* and that was because the FAA PMI allowed deviation from an A/D mandated SSID INSPECTION! NOTE: If you haven't read the entire *Aloha* accident *report -- the root cause for operators spending millions of dollars* -- e-mail us for a copy. Meanwhile, back to ***discretionary authority.***

"*18.3 Discretion*
by Doctor Mark Cooray

The keystone of the rule of law is the idea of the government of laws rather than the government of men. The keystone of the government of laws is legal control over human discretion. The existence of widespread discretion is therefore directly inimical to the existence of a liberal order. Discretions need to be exercised on the basis of justice or some real justification or even of mere reason. An unfettered discretion is an opportunity for temptation and for arbitrary, insolent, discriminatory, intrusive, socially engineering and corrupt, government. Where there are fixed laws there is (more or less) certainty, there is certainly impartiality (equality before the law) and consistency. A person may stand upon his legal rights without fear or favour. Discretion, on the other hand, undermines justice.

Discretion may exist in the context of executive, judicial and legislative branches of the modern state.

Executive discretion is the most dangerous of all forms of discretion. This is because its impact upon the citizen is immediate and uncertain. Legislative discretion is uncertain but not immediate. Judicial discretion is immediate but not uncertain. Executive discretion, in suffering from the effect of immediacy additional to uncertainty, is open to the greatest possible abuse. The administrator has immediate unfettered power over the individual who stands at his mercy. The opportunities for arbitrary, insolent, discriminatory, intrusive and corrupt activity as well as totalitarian social engineering, are maximised at this point." (NOTE: *I FOUND THIS ON THE WEB -- AN AUSTRALIAN SITE. WE'LL CONTINUE THIS TOPIC AND HOW IT RELATES TO* ***FIRE, SMOKE AND TOXICITY*** *ISSUES OF THE B787 IN THE NEXT NEWSLETTER)*

WE HAVE A NEW "FRIEND". . . . THE SAN FRANCISCO ZEPPELIN. Based in the 1930s era hangar built at Moffet Field for the U. S. Navy Dirigible USS Macon, it appears to make two sight seeing trips over The City each day. While the rigid airship is slightly longer than an Airbus 380, it takes less than 1/3 of the hangar's 1,140 feet. It passes over at about 500 feet - doing a whopping 35 knots - great for sight seeing! *google "s f zeppelin"* for details. Ah, memories of my *little boy days!* Keep an eye out for it on approach to SFO. It will be on your left as you approach over the bay.

EPILOGUE

A lot has happened since I sat down to write this issue. The *strikes* have been settled. Inspectors at Renton have discovered un-plated steel *nut-plates* in fuselages of 737NGs - *delivered* and *yet-to-be delivered* aircraft (the unstated consequences of this can require many manhours to correct and repair if corrosion has already started).

Inspectors at EVERETT discovered several thousand *bad fasteners* in the five 787 aircraft in *engineering tests* (structural loads & fatigue) and *prep for flight test*. (Some reports state *up to 19 ship sets of various sections of the aircraft* have been produced.) Removing fasteners (including those used to retain nutplates) is bad enough in "tin airplanes" because it can cause scratches in the fastener holes which lead to *wide spread skin cracking. In composites the replacement process can cause delamination of the plies . . .* and in either case is also known, in my opinion, as the beginning of the end for that hole and the surrounding "skin".

Let me see. If you replace any fasteners in a FATIGUE or STRUCTURAL TEST SPECIMEN (a.k.a. an airplane) do you have to re-do the tests? My guess -- you betcha!