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Safety of Flight Assessment

I was requested by Southwest Airlines (SWA) to review and assess the potential safety of flight risk that could have resulted from the continued in-service operation of 46 of their Classic 737 airplanes in March 2007 as they progressively inspected a small area (under 0.6%) of the fuselage skin as required by FAA Airworthiness Directive 2004-18-06. The assessment involved the review of technical documents associated with both mandatory and non-mandatory inspections, pertinent service/maintenance history for the 46 airplanes, a technical briefing by the Southwest Airlines Engineering Department and technical data/analysis provided by Boeing (the airplane manufacturer) related to structural integrity of fuselage skin cracks that were found on five of the 46 SWA airplanes. The scope of the assessment was confined to the safety of flight issues only.

Based on the information I have reviewed, it is apparent that on March 15, 2007, SWA initiated re-inspection of the affected airplanes to accomplish the inadvertently missed portion of FAA Airworthiness Directive (AD) 2004-18-06. A review of the historical information that led to the issuance of the AD indicates that a progressive inspection for fuselage skin cracking was initially distributed to operators in the form of a "non-mandatory" Service Bulletin (SB) that provided "risk mitigation" actions that operators were encouraged to incorporate into their maintenance program. This Service Bulletin was based, in large part, on an inspection program developed by Southwest Airlines. The issuance of the AD was a continued effort to ensure that cracks in the fuselage skin on the Boeing 737 airplanes was identified and mitigated well before they could pose a safety of flight issue. It is evident from the 4500 hour initial inspection requirement (regardless of aircraft age (i.e. flight cycles)) that the FAA did not regard the skin cracking as an "immediate threat" to the safety of flight of the airplane. Thus, the FAA Airworthiness Directive permitted aircraft to remain in-service for approximately 1½ years, until a normally scheduled heavy maintenance visit occurred, before the first inspection was required.

In addition, it is evident from the analysis and testing data developed by Boeing that cracks up to 6 inches in the fuselage skin do not compromise the structural integrity or pose a safety of flight issue. This is further supported by the design of the fuselage structure which incorporates "internal reinforcing doublers in the skin assembly" and "tearstraps", both of which are intended to provide strength, and slow or abate the growth rate of a crack under normal operating aerodynamic loads.

Based on the available data and information reviewed, it is apparent that there was no risk to the flying public in March 2007 while Southwest Airlines performed their program to re-inspect the small area of aircraft fuselages identified in the AD inspection that was inadvertently missed.

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Mr. Feith is a former National Transportation Safety Board (NTSB) Senior Air Safety Investigator with a wide range of aviation investigative, safety and experience. He has investigated hundreds of general aviation, business/corporate and air transport aircraft incidents and accidents worldwide during his 28 years as an aircraft accident investigator and aviation safety expert, of which more than 20 years was with the NTSB. Greg served as the Investigator-in-Charge or U.S. Accredited Representative for the investigation of numerous high profile aircraft accidents that include the ValuJet DC-9 in-flight fire in the Florida Everglades in 1996; the American Eagle ATR 72 in-flight icing accident at Roselawn, Indiana in 1994; the USAir DC-9 windshear accident at Charlotte in 1994; the Korean Air 747-300 controlled flight into terrain at Guam in 1997; the American Airlines MD-83 runway overrun at Little Rock in 1999; the Emery Worldwide Airlines DC-8 elevator control failure at Sacramento in 2000; the Swiss Air MD-11 in Peggy's Cove, Nova Scotia in 1998; and the Silk Air Boeing 737 in Palembang, Sumatra in 1997.

Greg has won numerous NTSB and aviation industry awards and was the recipient of an **Aviation Week and Space Technology Laurel Award in 1996** for his leadership in the investigation of the ValuJet DC-9 in-flight fire accident in the Florida Everglades. He also received the 2001 Embry-Riddle Aeronautical University Distinguished Alumni Award for "extraordinary distinction and success in the field of aviation and achievements;" and the **SAFE Association, Michael R. Grost Award** for "outstanding contribution in the field of accident investigation."

Greg is currently in private practice as an international aviation safety and security consultant specializing in: aircraft accident investigation, reconstruction and flight safety; expert witness testimony; general aviation, business/corporate and commercial airline flight safety and security program design, development, implementation and evaluation; and business/corporate and commercial airline emergency response (ERP) and crisis management program development and evaluation. He is also a principle member of The Aviation Response Management Advisory Group (TARMAC), which is comprised of former NTSB, FAA, FBI, NYCPD and U.N. experts dedicated to analyzing, developing and implementing programs that enhance both the flight safety and security of corporate/business aviation flight operations.

Greg is widely known and respected for his frequent public speaking engagements and safety lecture; involvement in aviation safety and security education programs, and his persona as an instructor at Embry-Riddle Aeronautical University in the area of accident investigation/reconstruction and aviation safety. Greg regularly appears in a variety of aviation safety-related television programs on Discovery, TLC, the History Channel, "Seconds to Disaster" on National Geographic and PBS. He is the host of a television series on the History Channel titled **Secrets of the Black Box**, dedicated to telling the story about the investigation of aircraft accidents and the "Lessons Learned" that have enhanced the safety of aviation. In addition, he is a frequent contributor to various writers for articles in aviation publications such as Business & Commercial Aviation, Aviation Week and Space Technology and Aviation International News. Greg is seen regularly as an aviation safety and security expert on NBC, MSNBC and other major networks worldwide.