GE
Aviation

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Subject: GE Aviation Submission for the AA383 Chicago Event
NTSB Investigation Number DCA17FA021

July 26, 2017

To: Ms. Lorenda Ward
Senior Investigator-In-Charge
Major Investigations (AS-10)
National Transportation Safety Board
490 L'Enfant Plaza East, SW
Washington DC 20594

Dear Ms. Ward,

Thank you for the opportunity to make this submission. GE Aviation appreciates the opportunity to participate in the investigation process and to provide this input prior to the final report.

As stated in the NTSB Powerplants and Materials Factual Reports, the CF6-80C2 engine High Pressure Turbine (HPT) Stage 2 disk, manufactured in 1997/98, contained a Discrete Dirty White Spot (DDWS) which was formed during the melt process of the nickel material. Cracks initiated at and propagated from this DDWS leading to fracture of the disk. Subsurface DDWSs not associated with voids, such as the DDWS that formed in the accident disk, are difficult to detect. Many of the quality records used during this investigation dated back nearly 20 years. The availability of these records was crucial to the investigation.

The charter of the NTSB is to determine probable cause and make recommendations to prevent recurrence. To this end, GE Aviation proposes the following safety recommendations for consideration by the NTSB:

- Recommendation 1: The FAA should engage with the industry to review premium quality cast & wrought nickel material stream processes to address potential melt anomalies. The approach used by the FAA for titanium material after the 1989 Sioux City accident (engaging through the AIA) may be a good model to follow in this instance.
    - Rationale: The issue of nickel material anomalies is not isolated to GE Aviation products. Other original equipment manufacturers' (OEM) engine models contain nickel alloy parts. Further agency and industry study is required to determine the best path forward for the engine models of all OEMs. Potential improvements in nickel melt/manufacturing and inspection processes should be evaluated and vetted at the industry level.

- Recommendation 2: The FAA should review current regulations regarding retention requirements for quality records and increase retention times to appropriate lengths (e.g.: life of the product for life limited and other critical parts). The FAA should also engage EASA and other regulatory agencies who may have similar regulations.
    - Rationale: Using decades old records during investigations is not unusual. The ability to properly investigate future events will be hampered if records are not available. Root cause determination and compiling lists of suspect parts may not be possible if quality records (e.g.: manufacturing, maintenance, repair, inspection) are routinely destroyed after FAA minimum record retention requirements are met. Had current FAA minimum record retention requirements been followed in the case of this event, many of these records would not have been available. For example, quality records need to be retained for only 10 years for critical components (ref. 14 CFR21.137(k)). A repair station may only be required to retain records for 2 years (ref. 14 CFR Part 145.219).

GE Aviation would like to close by reiterating our long-standing support of the NTSB investigation procedures and the party process. The system has worked well over the years and has helped to improve the level of aviation safety for the traveling public. We propose the above recommendations with the aim of improving product safety for the aviation industry.

Sincerely,

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