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Ms. Lorenda Ward
Investigator-in-Charge
Office of Aviation Safety
National Transportation Safety Board
490 E. L'Enfant Plaza, SW
Washington, DC 20594

RE: ATI Specialty Materials Party Submission regarding flight AA383, October 28, 2016

Dear Ms. Ward:

On behalf of ATI, I want to thank you for your efforts and for inviting us to participate in the investigation associated with the October 28, 2016 flight AA383. It has been a learning experience for the ATI team and increased our appreciation on the depth of the investigations performed during such an incident. Attached is a submission with recommendations relative to the incident.

Best regards,

[redacted]

Anthony Banik
Party Coordinator
ATI Specialty Materials

Submission to the

National Transportation Safety Board

for

Investigation of American Airlines Flight 383

Boeing 767-300, N345AN, Chicago, Illinois

October 28, 2016

August 3, 2017

Anthony Banik
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ATI Specialty Materials
1000 Six PPG Place
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[redacted]

Party Coordinator

Background

On October 28, 2016, an American Airlines Boeing 767-300, aircraft, N345AN, powered by two GE CF6-80CB6 turbofan engines experienced an engine failure.

The investigation determined that the failure was related to a High Pressure Turbine (HPT) Stage 2 disk, manufactured in 1997/98. Metallurgical examination detected that the disk contained Discrete Dirty White Spots (DDWS) which formed during the final melt process of the nickel material.

GE has determined and the investigation has confirmed that DDWSs, not associated with voids, such as those observed in the accident disk, are difficult to detect.

Investigation

As part of the investigation of this accident, the investigators had the benefit of quality records which, in some instances, dated back 20 years.

As it related specifically to the metallurgical examination of the failed disk, this permitted the Powerplant Group to conduct an extensive investigation which included the manufacturing and inspection history of the disk and the material from which it was manufactured.

Conclusions

1. The review of the production records from which the material was produced did not reveal any anomalies or deviations from the approved processes.

2. Comparison of records for other ingots/billets produced during the same time period showed no greater potential for the formation of an anomaly in the material when compared to the material which was used in the production of the failed disk.

3. There were no practices or processing records identified which indicated that the material applied in the production of the failed disk had a different or greater potential for formation of an anomaly than any other ingots/billets.

4. All inspection processes associated with the manufacture of material from the failed disk complied with requirements at the time of manufacture.

Recommendations

1. As a result of the large number of variables in vacuum arc remelting, accelerating progress in this area of improved practices while mitigating risk is not currently achievable by a single organization. Therefore, a working group of government, academia and industry should be established to provide a focus on improved understanding in the dynamics of plasma field during vacuum arc remelting. In connection therewith, a program should be established to investigate methods of assessing arc stability and the relationship to the formation of anomalies such as that observed in Stage 2 high pressure turbine disk.

2. As noted in the Powerplant Group Chairman Report, the presence of certain types of anomalies is an ongoing challenge for existing inspection practices. Therefore, as recommended in the report, translating the laboratory work relative to advanced non-destructive inspection processes into equipment and practices suitable in a production environment may further enhance operational impact and mitigate such occurrences. This activity may better be achieved in conjunction with the material producers, turbine manufacturers and government agencies.

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