

ATTACHMENT 4

AIRWORTHINESS GROUP CHAIRMAN'S FACTUAL REPORT

DCA16FA217

CFM CFM56-7B Southwest ESN 874112 Event – Fan Case Analysis dated January 19, 2017



The Power of Flight

CFM56-7B Southwest ESN874112 event FAN CASE ANALYSIS

01/19/2017

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FAN BLADE FRAGMENTATION

SEQUENCE

2 CFM Proprietary Information subject to restrictions on the cover





BLADE # 23 TIP PANEL TRAJECTORY

3 CFM Proprietary Information subject to restrictions on the cover







Tip panel impact 1 1 st contact



4 / CFM Proprietary Information subject to restrictions on the cover Preliminary data based on non validated assumption

12 H















FAN BLADE # 23 TIP PANEL TRAJECTORY





FAN case inner view







FAN BLADE # 23 TIP PANEL TRAJECTORY





FAN case inner view





BLADE # 23 MID SPAN FRAGMENT TRAJECTORY

















FAN BLADE # 23 MID SPAN FRAGMENT TRAJECTORY



FAN case inner view ¹³ / CFM Proprietary Information subject to restrictions on the cover Preliminary data based on non validated assumption





BLADE # 23 ROOT BLADE TRAJECTORY

14 / CFM Proprietary Information subject to restrictions on the cover



















6 H



12 H















FAN BLADE # 23 ROOT TRAJECTORY



FAN case inner views

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SOUTHWEST



FAN BLADE # 23 ROOT TRAJECTORY





Back Up

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Outer panel Estimation of ESN874112 fragment angle Top ? Measurement on fan casing from ESN874112 Mid span 140 g Spiraling angle measurement Fragment Mid span 510 g on ESN874112 fan case **Outer Panel** -14° 120 g ~6° Mid Span ~9° 2410 g **Root Panel** A1 flange Fan case Inlet **Root panel Spiraling angle**

FBO – Released fragments energy estimation

Spiraling angle measured on fan case from ESN874112 are below data provided during certification process (15°)