Recent Incidents of HEWABI

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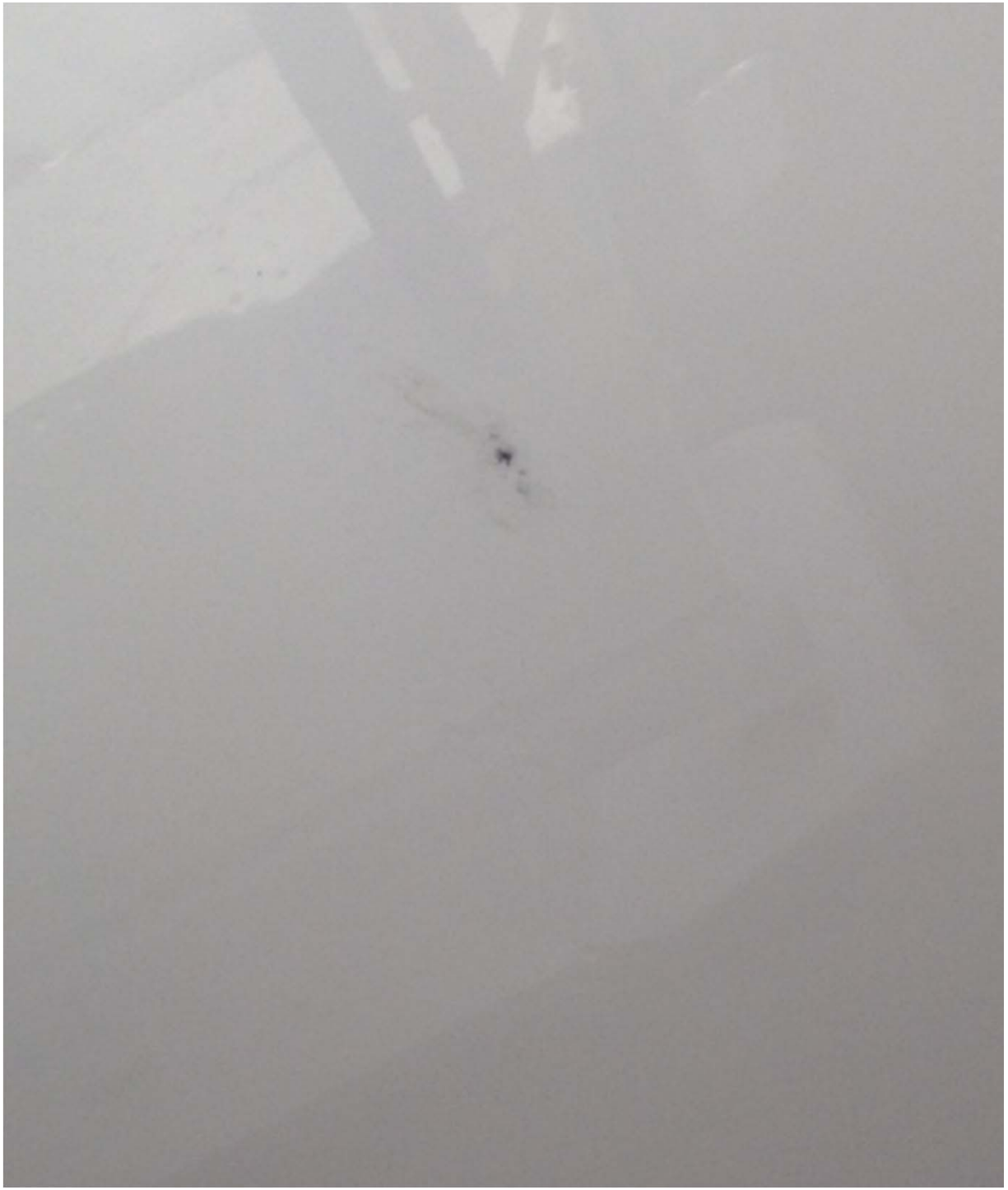
EXAMPLE #1

- June 16, 2015
- DIA
- Witnesses reported vehicle contact with 787

- View looking aft
- Contact made by rubber tube covering railing

- View looking up
- Contact made by rubber tube covering railing at red arrow

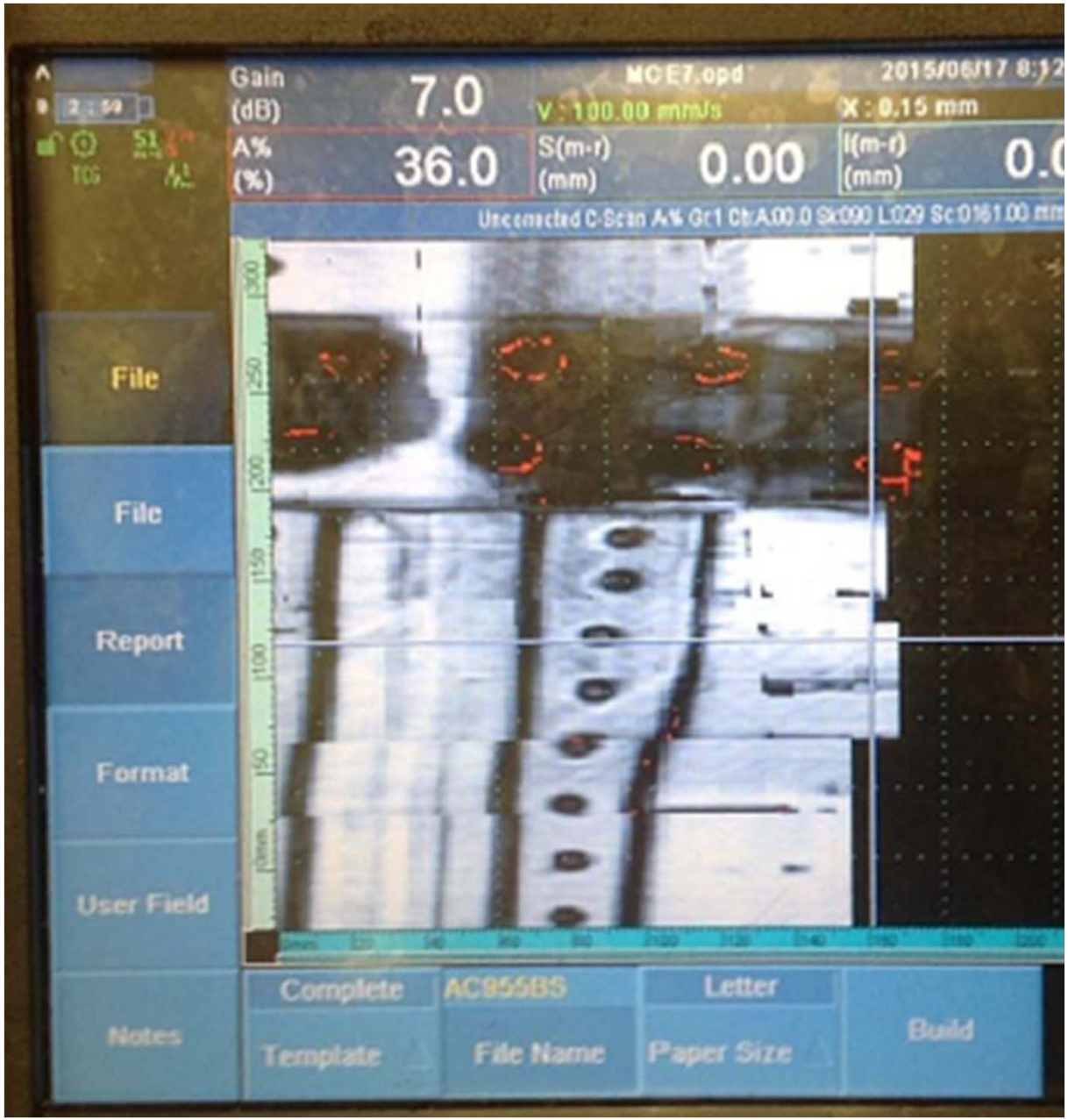
- View looking up
- Rubber scuff on surface
- Mechanic check per AMM chap 05 requirements
- Ramp Damage Checker shows acceptable



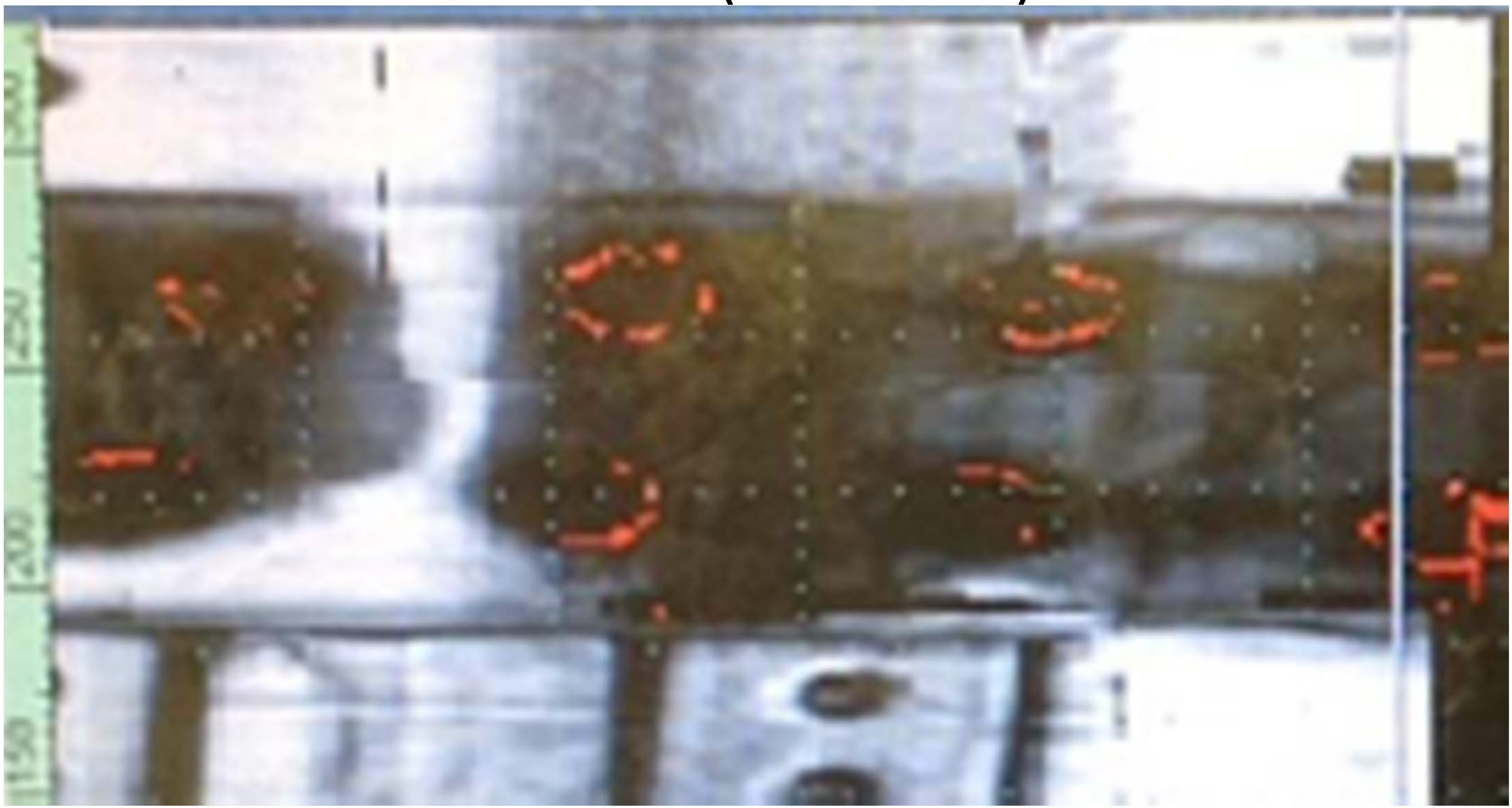
EXAMPLE #2

- During the same incident the aircraft was pushed hard enough that it pivoted around the landing gear and Door 1L contacted the jet way
- SRM Damage Assessment chapter requires NDT

- C-scan NDI of Door found “anomalies” – the dark areas around fastener holes (red circles)
- SRM does not identify these
- Drawing not accessible by airline
- NDT manual unclear for pass/fail criteria
- Inspectors unable to find acceptable so the OEM was contacted to confirm signals are acceptable



- Close up of Ultrasonic C-scan image: Dark areas around fastener holes (red circles)

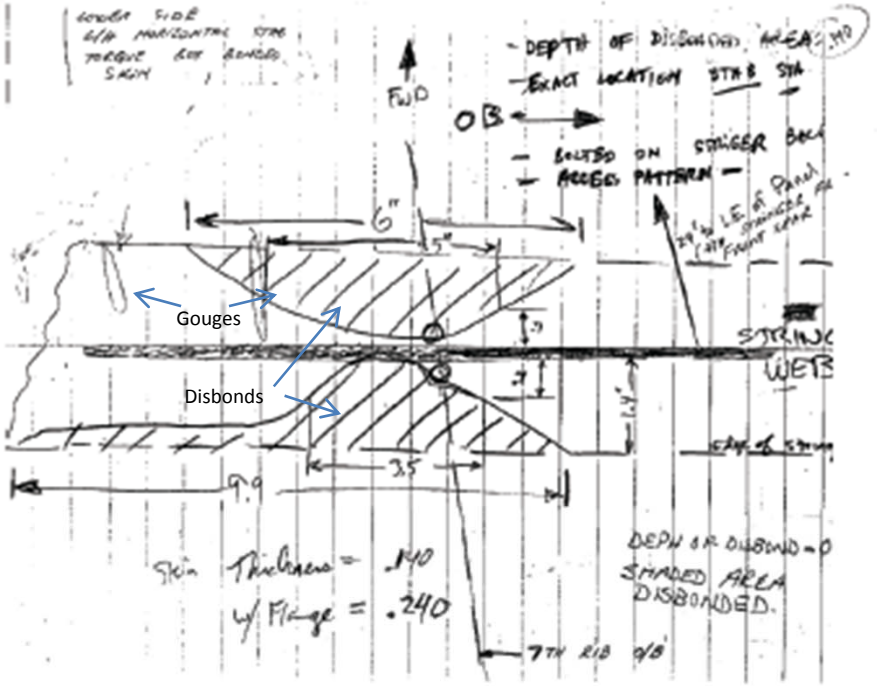


- EXAMPLE #2: Runway Debris thrown by engine
  - Engine test was performed over soft asphalt resulting in about 3 or 4 cubic feet of asphalt hitting the 777 Horizontal Stabilizer and Tailcone
  - Damage found to fiberglass panels, Tailcone, and Elevator.
  - Gouges found on Horizontal Stabilizer skin
    - Depth about .015 to .020” deep, including paint
  - SRM has limit for allowable gouge of “1 ply”
    - No instruction for mandatory NDT
  - Performed C-scan ultrasound inspection and found a disbond.
  - Contacted OEM for repair
  - Repair was to install fasteners

- EXAMPLE #2: Runway Debris thrown by engine

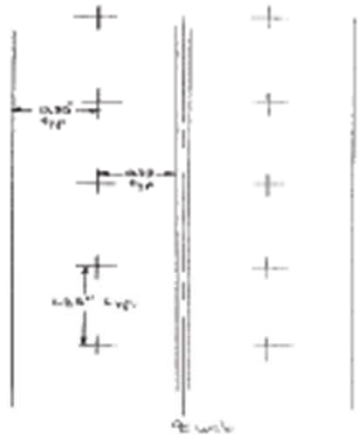
777 In-Service Experience-Details

Empennage Stringer Disbond - Engine Thrown Debris



AOG Damage Description

Straight-forward, effective repair



CONCLUSIONS

- Compliance to manuals is stressed for all steps in assessment and repair. Poor manuals leads to uncertainty and extends time out-of-service
  - During Damage assessment:
    - Pre-flight for walk-around checks
    - SRM chapter 51 for Damage Assessment, Heat, Defects types
    - AMM chapter 5 for non-routine checks
    - NDT Manual for general and part specific instrumented inspections
  - During Repair: SRM used for Allowable damage, identification of plies, and repairs
    - Allowable damage should always be in measurable metric, like “inches” and not “plies”
    - Specify during Damage assessment does not include paint or other non-structural layers.
  - During Inspection - NDT manual
    - When NDT is needed, SRM/AMM should be clear - “You must perform NDT.”
    - Allow use of undamaged areas of structure as reference standard
    - Clear pass/fail criteria, using measurements and not number of plies
    - Use industry accepted Reference Standards when applicable to structure, such as published by CACRC/SAE: ARP5605, ARP5606
  - Drawing access is needed for details and configurations not covered by SRM
- PSE and FCBS structure require FAA-approved documents
  - Engineering opinion on acceptability not sufficient
  - All documents – NDT manual, SRM, etc. – must have detail
  - Manufacturing allowable defects not usually included in the SRM Allowable, but can be found with visual and NDT inspections
    - Allowable Damage covers in-service and environmental damage: cracks, disbond, dents, gouges, etc.