VERTICAL DROP TEST OF A SHORTS 3-30 AIRPLANE

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TEST OBJECTIVE

Determine the impact response of the:

- Fuselage
- Seat tracks

of a high-wing commuter airplane, during a severe, but survivable, impact.
SHORTS 3-30

- 30 passenger regional transport
- Twin-turboprop
- High-wing design
- 58 feet long
- 75 foot wingspan
- Max takeoff weight
  22,900 lbs
TEST ARTICLE CONFIGURATION

- 26 Passengers + Crew
  - 7 anthropomorphic test dummies
  - 21 mannequins
- Interior furnishings removed
- Some control surfaces removed
  - flaps, elevators, ailerons
- No Landing gear
- Simulated fuel (3,875 lbs)
- Simulated engines
- Max luggage - Forward and AFT baggage compartments
- Weight 21,210 lbs
FUEL SYSTEM CONFIGURATION

Cell 4

Cell 3

Cell 2

Cell 1

Cell 3-4 Interconnect Pipe
VIDEO
POST-TEST
SHORTS FUSELAGE TOP VIEW
INTERIOR LOOKING FORWARD
AFT CEILING DEFORMATION, L/S
AFT CEILING DEFORMATION, R/S
SEAT TRACKS AND FLOOR
POST-TEST DATA

- 118 data channels
- Impact velocity 30 ft/s
- The airplane experienced 90 g’s, with a pulse duration of 15 msec.
- The under floor crush measurements were approximately 0.1 inch.
CELL 3-4 INTERCONNECT FITTING
CRUSHED GRAVITY FEED OUTLET
CONCLUDING REMARKS

• Fuselage impact velocity was 30 ft/sec.

• Airplane experienced 90g’s, with a pulse duration of 15 msec.

• Very little lower fuselage deformation.

• Substantial upper fuselage damage.

• Seat tracks remained attached to the fuselage.
CONCLUDING REMARKS

• Most passenger seats experienced structural failure.
• All exits remained operable.
• Numerous windows shattered.
• The overhead fuel tanks broke loose from their mountings, resulting in large quantities of simulated fuel being spilled onto the occupants.