Docket No. SA-522

Exhibit No. 7-Q

NATIONAL TRANSPORTATION SAFETY BOARD

Washington, D.C.

Airbus Vertical Tail High Loads for In Service Events

(6 Pages)

Loads

- **LE10 - Vertical tail high loads in service events**

Loads

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  - Process analysis
    - Identification of events with potential high loads development on vertical tail.
    - Individual review of each event information/data
    - Classification with reference to four categories:
      - Airplane “loss of control”
      - Systems malfunctions
      - Atmospheric disturbances (gust)
      - Others (inadvertent engine reverse deployment in flight,..)
    - Establishment of the necessary data for loads analysis (time history).
      - Controls deflection (rudder,…) and aircraft movement parameters (sidestep,…) using the “Kinetic/Ny integration” method.
    - Loads analysis
    - Decision on structural inspection (program, execution)
    - Review of structural inspection feed-back (finding).

Loads

- **LE10 - Vertical tail high loads in service events.**

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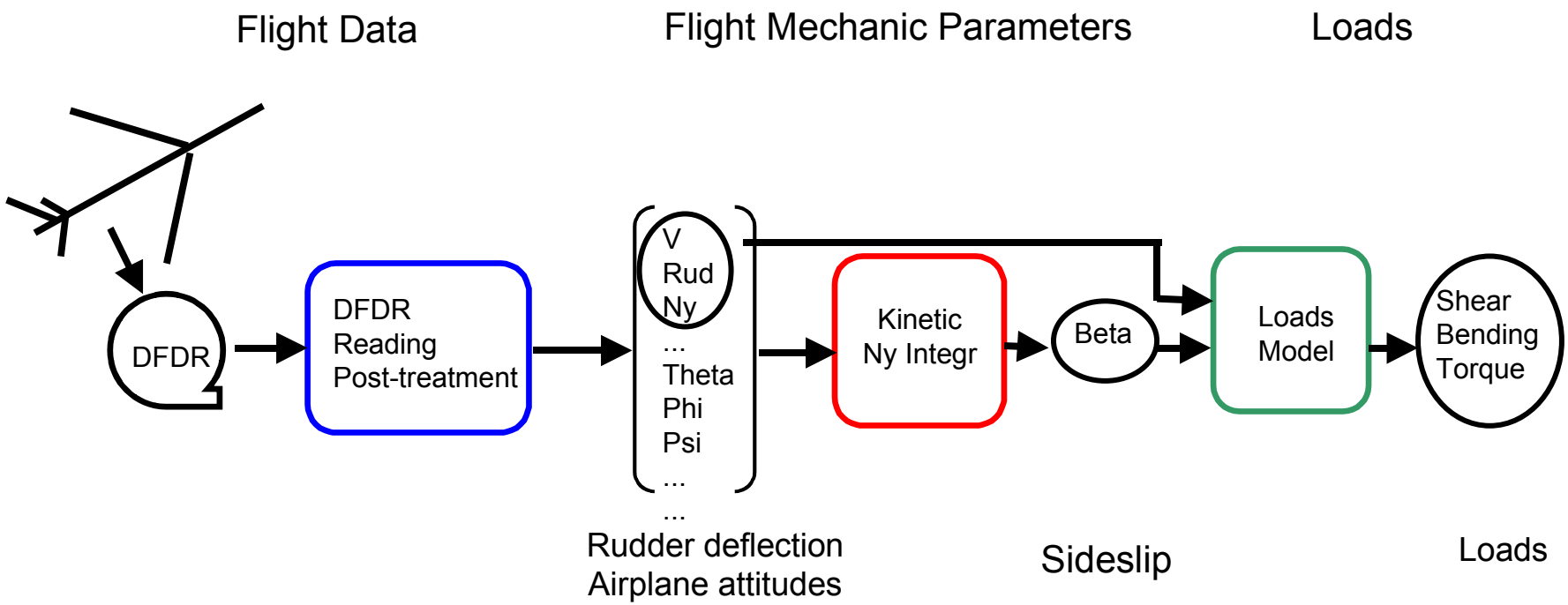
  - Event analysis principle

    – Kinetic/Ny Integration method used.

    – Process applied



Loads

- **LE10 - Vertical tail high loads in service events - A300-600**

EVENT DATE	Event Family		Event	Speed (Vcas	Config	Event	Crew Rudder input	Rudder doublet Yes/No	Ny (g)	Mx FinRoot		Detailed Inspection
NOV-01	OPERATION		A	250	Clean	successive Rudder doublets to TLU	yes	yes	0.38	1.96LL		Accident
MAY 97	OPERATION	Stall / Loss of control	B	190-230	Clean	Stall & Loss of control. Several Rudder doublets to TLU during recovery.	yes	yes	0.55 & 0.7	1.53LL (1st fully recorded doublet) Beyond UL estimate for subsequent doublets (DFDR data not recorded)		11March02 Local damages at rear RHS fin attachment.
MAY 89	OPERATION		C	250		Rudder jerk	yes	yes	0.38	1.11LL		16March02 No Finding
	SYSTEM MALFUNCTION	System Failures	D	220	Slats retract	Rudder trim runaway in climb at slat retract	yes	no	0.33	0.8LL		No
NOV 99	SYSTEM MALFUNCTION	System Failures	E	225-290	Slats retract	Rudder trim runaway in climb at slats retract	yes	no	0.21	0.6LL		No
MAR 99	SYSTEM MALFUNCTION	Maintenance error	F	180-190	Slats out	Rudder oscillations in go arround at AP disconnect	no	no	0.32	1.16LL		13March02 No Finding
NOV 98	OTHERS	T/R In Flight	G	300	Clean	Inadverment thrust deployment			0.21	0.86LL		21March02 No finding
	Gust	all cases reported/analysed show Ny < 0.3g, less lower than the one coming from design analysis										

Loads

LE10 - Vertical tail high loads in service events - A310

EVENT DATE	Event Family		Event	Speed (Vcas)	Config	Event	Crew Rudder input	Rudder doublet Yes/No	Ny (g)	Mx FinRoot		Inspection
FEB 91	OPERATION	Stall / Loss of control	H	50 - 300	Conf 2	Missed approach followed by 3 successive stalls in go-around / loss of control with repetitive rudder movements.	yes	yes	0.36 0.69	1.55LL 1.35LL		Done 3April02 No Findings
SEP 94			I	190-225	Conf 3	Missed approach followed by stall in go-arround.	yes	no	0.37	1.12LL		Done 26March02 No finding
NOV 99	SYSTEM MALFUNCTIO	System failure	J	275	Clean	Rudder Trim runaway while AP engaged; lateral upset at AP disconnect	yes	yes	0.49	1.06LL		Done 28March02 No Findings
SEP 92			K	290 425	Clean	Rudder Trim runaway while AP engaged: lateral upset at AP disconnect followed by overspeed.	yes	no	0.32	0.8LL		No - Not recommended
	Gust	all cases reported/analysed show Ny < 0.3g, less lower than the one coming from design analysis										