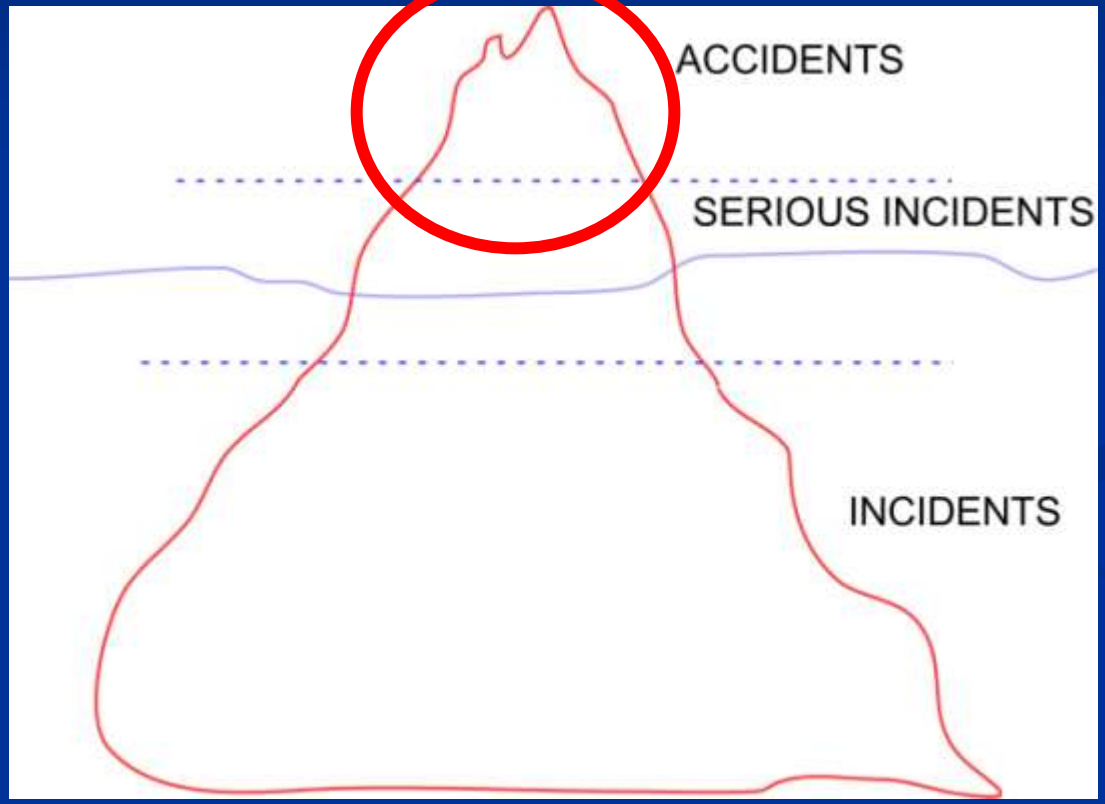
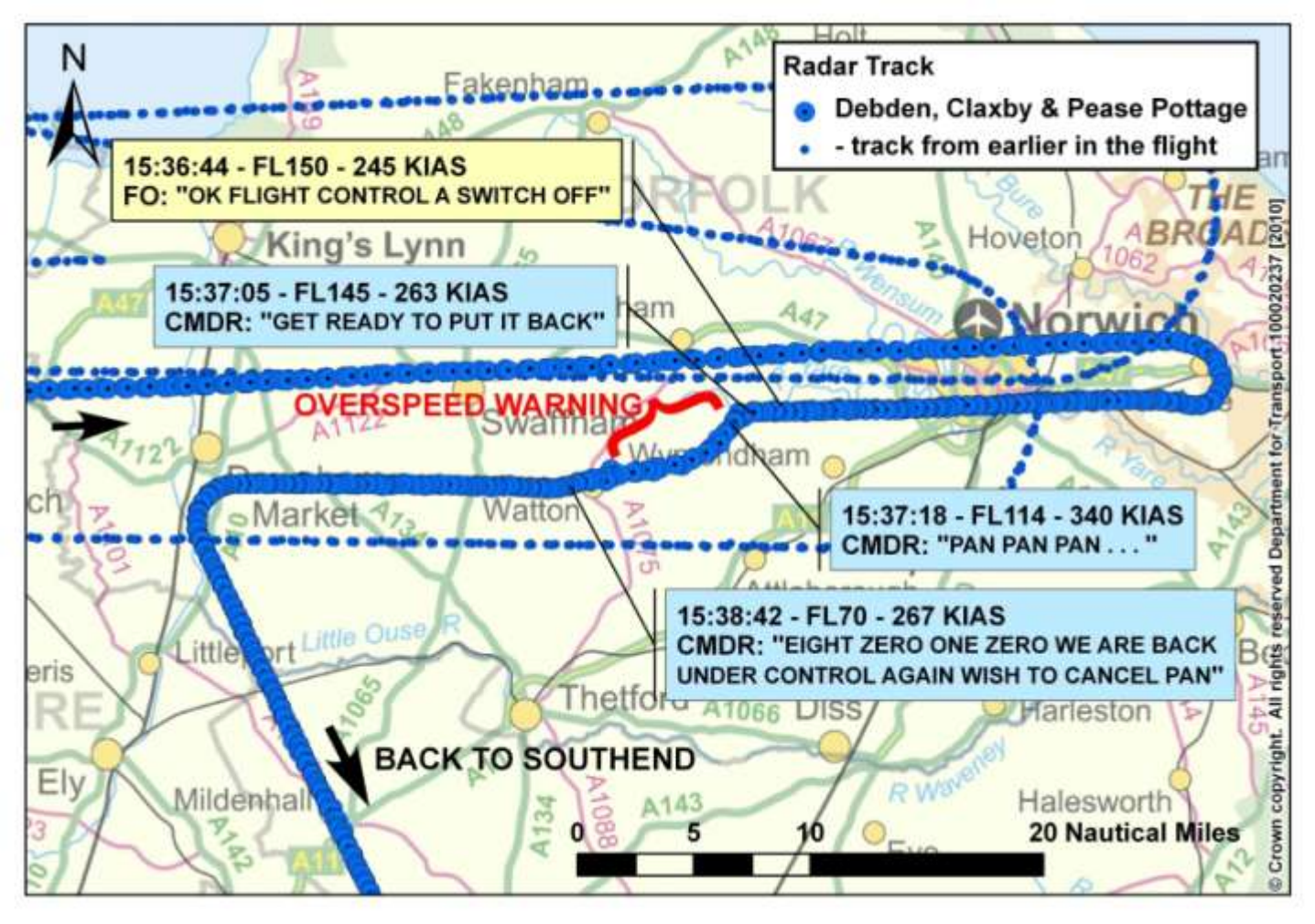
Human performance and systems, experience from recent accidents/incidents

Phil Sleight
Principal Inspector of Air Accidents
Air Accidents Investigation Branch

AAIB Investigations



Boeing 737


N
Radar Track
Debden, Claxby & Pease Pottage
- track from earlier in the flight
15:36:44 - FL150 - 245 KIAS
FO: "OK FLIGHT CONTROL A SWITCH OFF"
15:37:05 - FL145 - 263 KIAS
CMDR: "GET READY TO PUT IT BACK"
OVERSPEED WARNING
15:37:18 - FL114 - 340 KIAS
CMDR: "PAN PAN PAN . . . "
15:38:42 - FL70 - 267 KIAS
CMDR: "EIGHT ZERO ONE ZERO WE ARE BACK UNDER CONTROL AGAIN WISH TO CANCEL PAN"
BACK TO SOUTHEND
Fakenham
King's Lynn
Hoveton
Norwich
Swaffham
Market
Watton
Thetford
Diss
Harleston
Ely
Mildenhall
Halesworth
0
5
10
20 Nautical Miles
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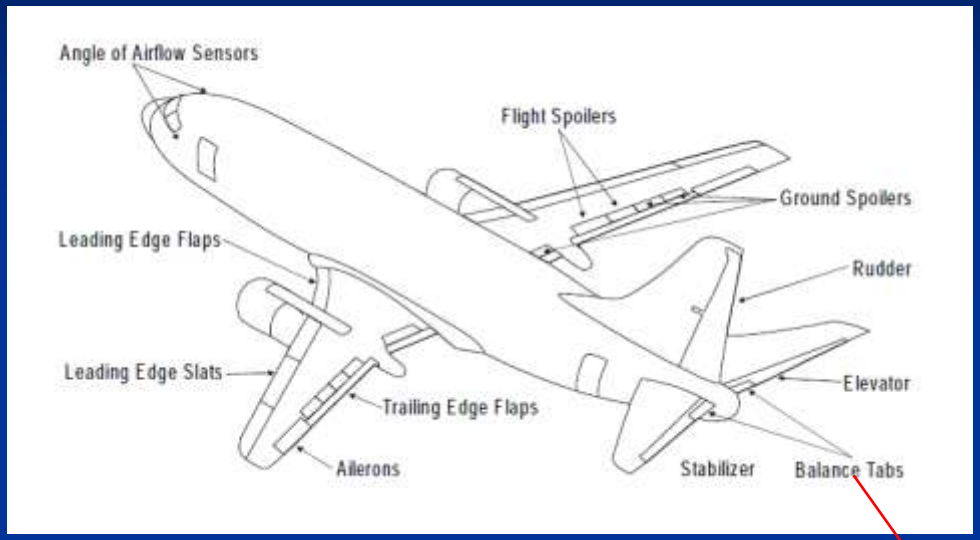
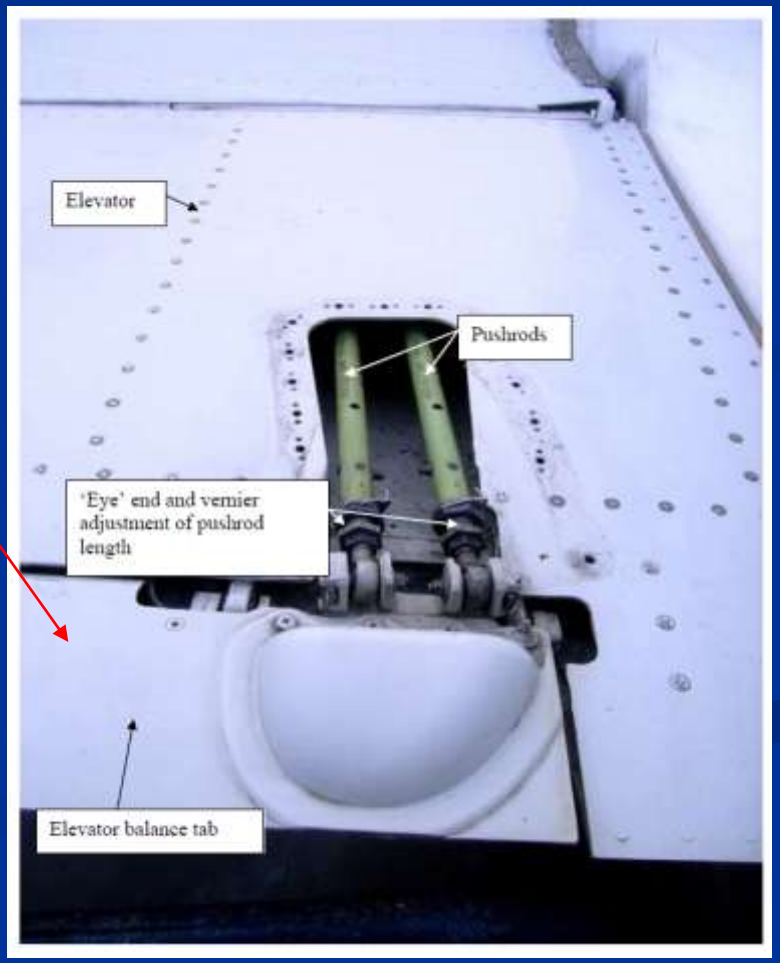
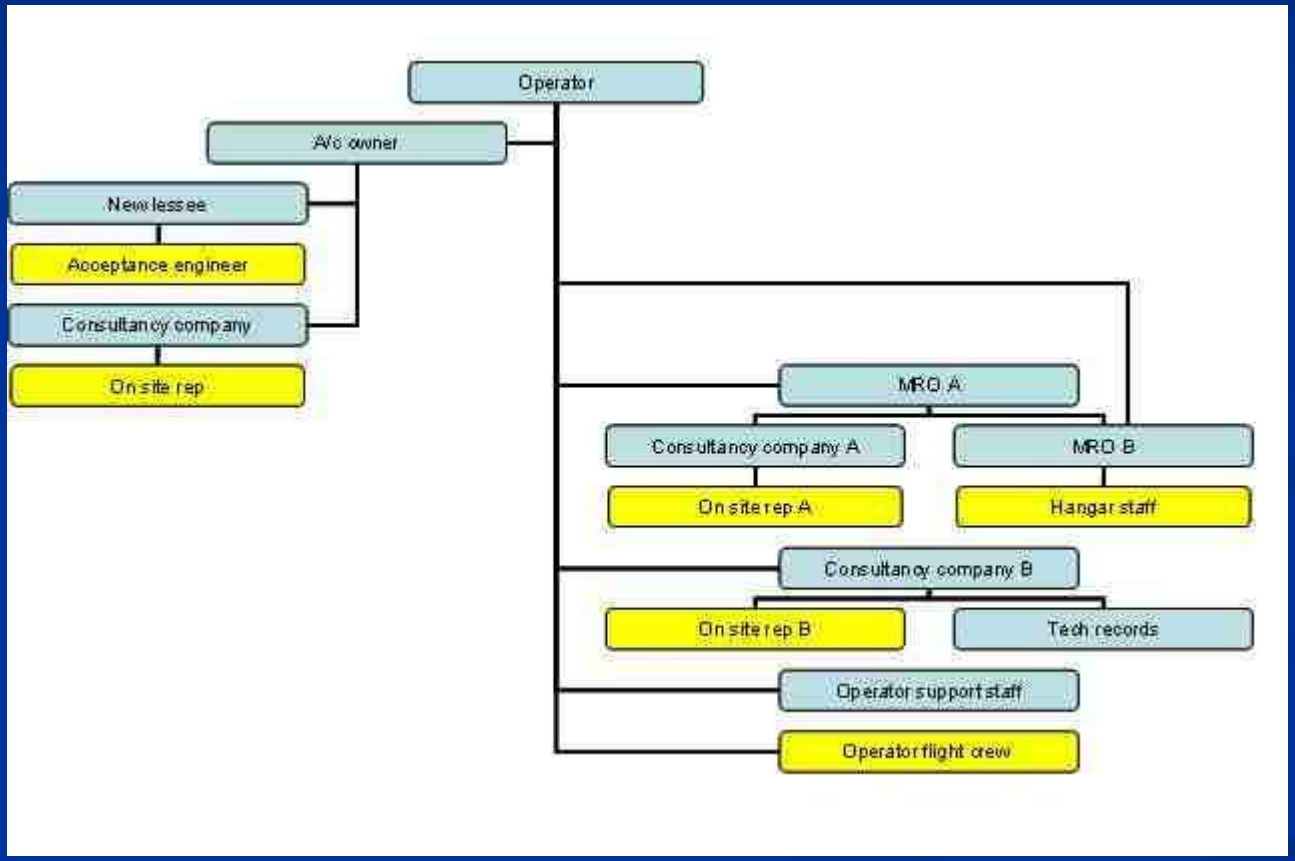
Boeing 737


Angle of Airflow Sensors
Flight Spoilers
Ground Spoilers
Leading Edge Flaps
Rudder
Leading Edge Slats
Elevator
Trailing Edge Flaps
Ailerons
Stabilizer
Balance Tabs


Elevator
Pushrods
'Eye' end and vernier adjustment of pushrod length
Elevator balance tab

Boeing 737


Operator
A/c owner
New lessee
Acceptance engineer
Consultancy company
On site rep
MRO A
Consultancy company A
MRO B
On site rep A
Hangar staff
Consultancy company B
On site rep B
Tech records
Operator support staff
Operator flight crew

Identified issues

- Poor recording of task requirements
- Poor communication
- Complex organisation
- Assumptions on roles/responsibilities
- Lack of clarity on boundaries of responsibility

Falcon 2000

Identified Issues

- Ad-hoc maintenance outside of AMM/documentation
- Poor preparation/briefing – lack of test schedule
- Poor communications
- Unclear roles/responsibilities

Dash 8

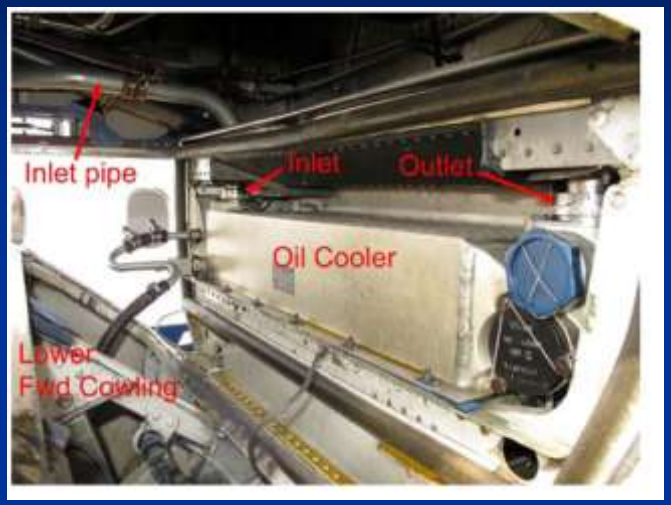
Figure 3

Left engine nacelle and landing gear leg after landing at Bristol

Figure 4

Right engine nacelle and landing gear leg after landing at Bristol

Dash 8



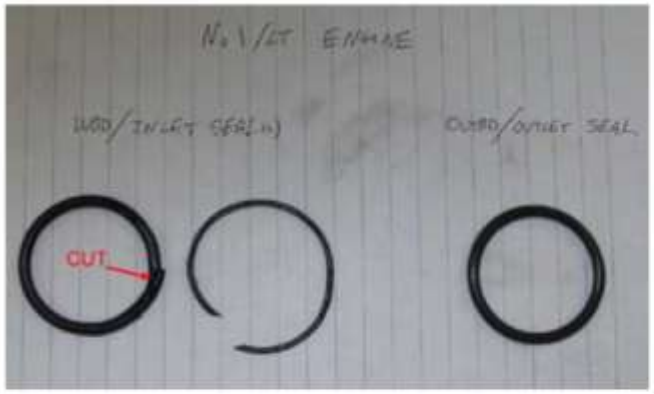


Figure 7

Left engine oil cooler inlet and outlet seals;
large inlet seal contained a cut; small inlet seal was split

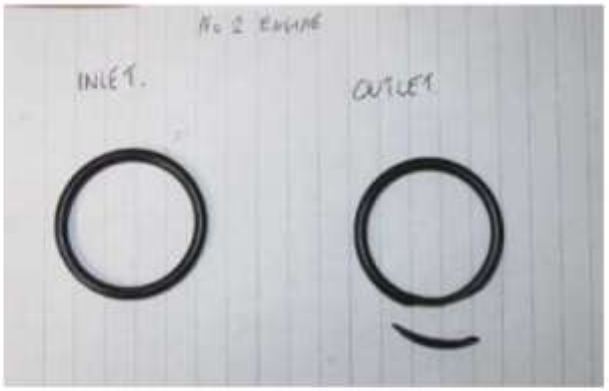


Figure 8

Right engine oil cooler inlet and outlet seals;
outlet seal had been cut; severed piece shown below it

Identified Issues

- Poor communication
- Unclear information in repair and maintenance instructions
- Fatigue?

Theme

- In all cases the “system” failed
- Several causal and contributory factors
- The barriers to prevent occurrence were circumvented or in-effective
- Human performance within the “system” affected the outcome

Outcome

- Recommendations have been made to:
  - Improve clarity in test schedules, manuals and procedures
  - Regulators to review regulations and guidance in OPS 1, Part M and Part 145, continued airworthiness and human performance limitations
  - Operators to clarify roles, responsibilities for staff conducting tests and to reflect this in procedures

References

The reports can be found on the AAIB website:

WWW.AAIB.GOV.UK

http://www.aaib.gov.uk/publications/bulletins/september_2010/boeing_737_73v__g_ezjk.cfm

http://www.aaib.gov.uk/publications/bulletins/december_2010/falcon_2000__cs_dfe.cfm

http://www.aaib.gov.uk/publications/bulletins/june_2011/bombardier_dhc_8_102__sx_bio.cfm