Transport Canada Transports Canada

AVIATION OPERATIONAL MEASURES FOR FUEL AND EMISSIONS REDUCTION WORKSHOP

Non-Revenue Flying

Kevin M Morris

Manager Environment, British Airways

Airline Planning Panel
Ottawa, 5-6 November 2002

Canada

Non-Revenue Flying

- What is Non-Revenue Flying?
- Post Maintenance
  - Engine testing
- Diversion/Positioning flights
- Test Flights
- Epilogue:
  - Tales of the unexpected

Non-Revenue Flying

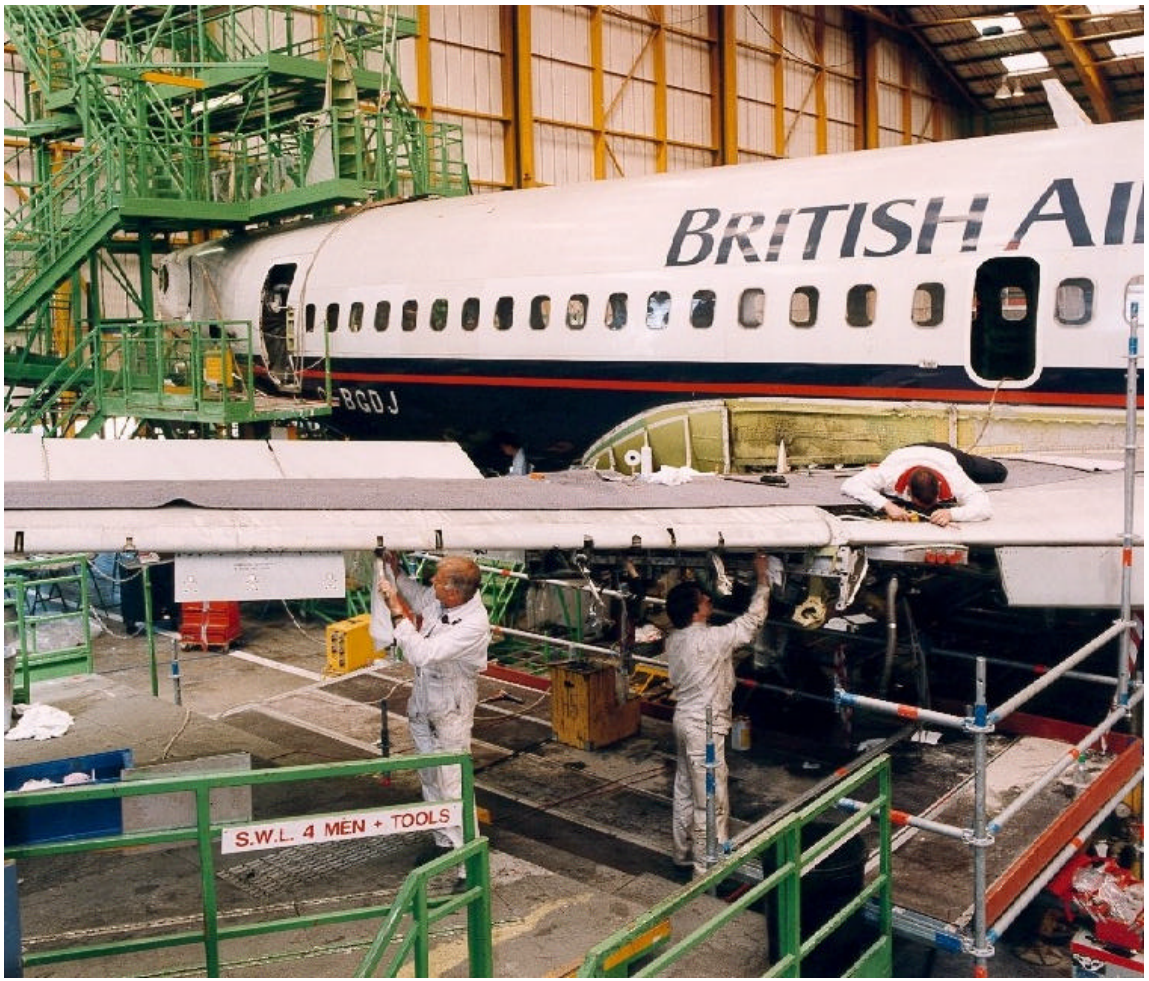
- Any flight that doesn't make money!
- Includes flights for:
  - Training, Ferry, verification, positioning, testing, development, + Ground Engine running(?)

Non-Revenue Flying

- Some Non-Revenue flying is necessary, but it is expensive, uses fuel and creates unwanted emissions
- Can sometimes be reduced or "managed" or coupled with commercial service

Transport Canada Transports Canada

Post Maintenance



Airline Planning Panel
Ottawa, 5-6 November 2002

Canada

Verification of Maintenance

- Result of some maintenance actions can not be accurately verified on the ground e.g.
  - Engine re-light envelope
  - Manual reversion
  - Some emergency systems, etc.
- Some flying may be necessary

B 737 Manual Reversion

- Check is required if control rods, system linkages are disturbed
  - Check at FL350, switch off both control systems, manual trim out
  - Recording of results allowed a check at 10 000 ft instead
  - Resulting in approx. 1 hour reduction in flight time, and savings in fuel and emissions

Transport Canada Transports Canada

Engine Ground Running

Airline Planning Panel
Ottawa, 5-6 November 2002

Canada

Engine Ground Running

- Post maintenance action, e.g.
  - Check starts
  - Thrust reverser verification
  - Leak tests
- Reduce time of running
- Reduce power setting
  - To the minimum required

Concorde Ground Runs

- Following temporary suspension of C of A, Concorde engines run on a daily basis.
  - Runs of 1 hour duration
    - 10 min at full reheat power
    - Rest at high power
- Problems with noise, fuel use

Concorde Ground Runs

- Reappraise requirements
- Long term, not short term
  - Reheat not necessary
  - Push to high power, then reduce to a lower power
  - Running time reduced
- Approx. 80% reduction in fuel

Transport Canada Transports Canada

Diversions and Positioning

Airline Planning Panel
Ottawa, 5-6 November 2002

Canada

Positioning Flights

- Diversions are BAD NEWS!
- Choice of alternate is important:
  - Too close - both can have similar weather
  - Too far - high cost in time and fuel for diversion and recovery
- Choose wisely!

Positioning Flights

- Split operations, sometimes require positioning of aircraft
- Positioning also required if Maintenance is carried out away from main base
- Sometimes a commercial load can be carried (e.g. B777 delivery flight with cherries)

Transport Canada Transports Canada

Development, TI and Test

Airline Planning Panel
Ottawa, 5-6 November 2002

Canada

Test Flying

- Some test flying is necessary
  - Required by Manufacturer (MM)
  - Required by the Regulator
  - Required by the airline
- Sometimes possible to combine test flights
  - e.g. Concorde noise with AWFT

Test Flying - costs

- Typical AWFT flight fuels:
  - ATP - 2 000 kg
  - B737/A320 - 6 000 kg
  - B757 - 12 000 kg
  - B767 - 12 000 kg
  - B777 - 13 000 kg
  - B747 - 30 000 kg
  - Concorde - 78 000 kg
- Other type probably less!

Test Flights - Minimisation

- B.I.T.E.
- Do everything that's possible on the ground
- Record everything, and review Test during revenue flying (if possible!)
- Construct logical test schedules

B 737 Alternate Flap

- Problem found with Boeing 737 alternate flap, during AWFT
- Problem resolved, but UK CAA required verification flights
- Agreed for ‘Management’ Pilots to use alternate system to lower flaps on commercial flights into LHR

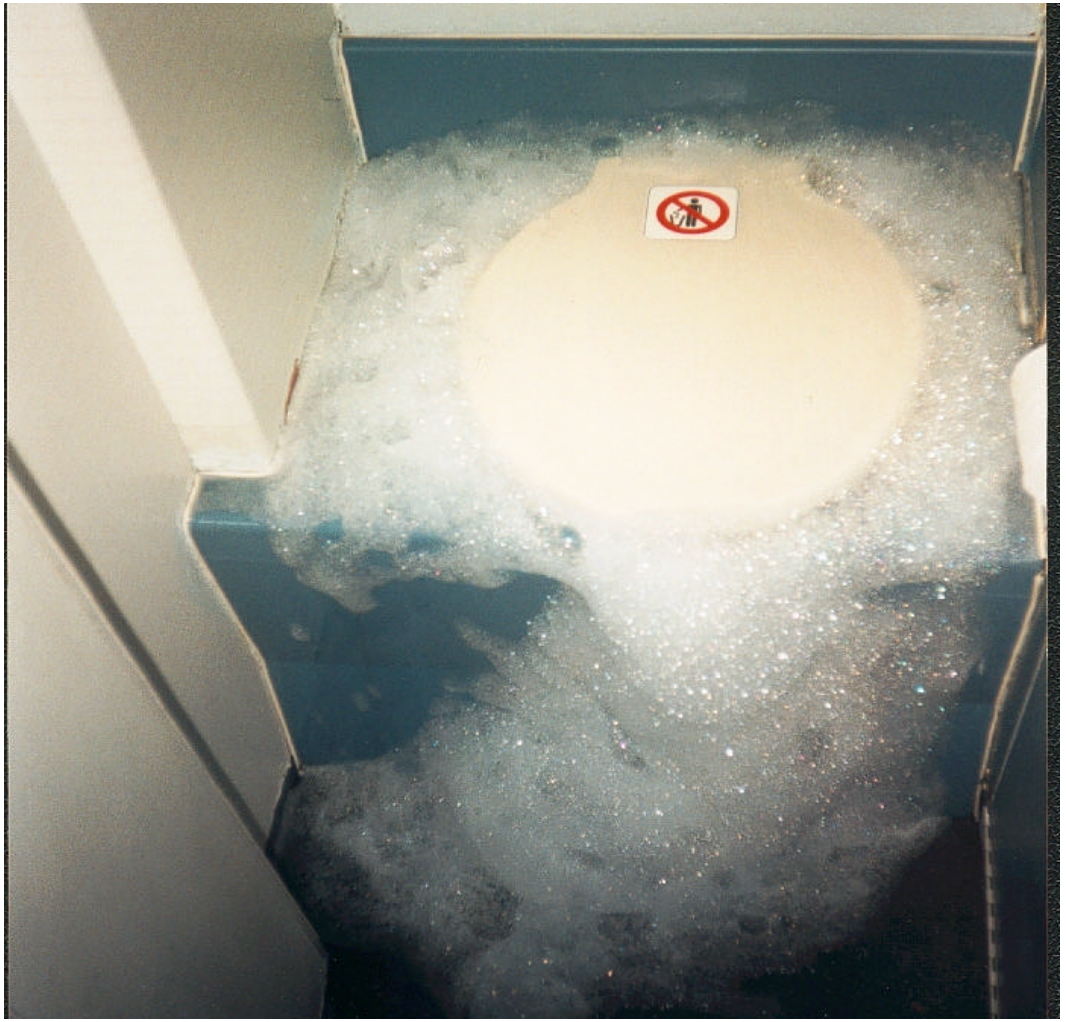
Test Flying

- It is not always possible to recreate flight and pressurisation loads on the ground. For this reason,

- Some defects can only be demonstrated....

Transport Canada Transports Canada

....in the air!



Airline Planning Panel
Ottawa, 5-6 November 2002

Canada

Transport Canada Transports Canada

AVIATION OPERATIONAL MEASURES FOR FUEL AND EMISSIONS REDUCTION WORKSHOP

Thank you !

Airline Planning Panel
Ottawa, 5-6 November 2002

Canada