



DFS Deutsche Flugsicherung

WakeNet3-Europe Safety Workshop

Introduction: Incident and accident monitoring and analysis

Amsterdam, 18.10.2010

*Jens Konopka (jens.konopka@dfs.de)
DFS Deutsche Flugsicherung GmbH*

The good news at the beginning ...

- Accident analysis is not a pressing issue, there is a very small number of accidents where wake turbulence was the prime cause.
 - Nov. 2008, Learjet 45 behind B767 on approach to Mexico City
- Wake turbulence is not among the large aviation hazards.
 - Wake vortices are mentioned only indirectly in the ICAO Global Aviation Safety Roadmap.

Agenda

- **Introduction**
- **Topic 1: Wake Vortex Reporting Requirements**
 - ICAO proposal, statement by Airbus
- **Topic 2: Wake Vortex Incident/Accident Data Repositories**
 - UK reporting scheme, existing incident/accident data bases
- **Topic 3: Analysis of Wake Vortex Encounters – ATM View**
 - examples by DFS and NATS (see UK reporting scheme)
- **Topic 4: Analysis of Wake Vortex Encounters – Aircraft Operators' View**
 - Statements by ECA and Lufthansa
- **Synthesis**

Topic 1: Wake Vortex Reporting Requirements

- Which kind of information is needed?
- Who needs information and for what purpose?
 - safety monitoring
 - wake vortex research
- Which data is essential?
- **... your questions and input might be added here**

Topic 1: Why Wake Vortex Reporting is Needed

- Assessment of wake turbulence related risk,
 - when new aircraft are to be introduced (e.g. A380-800, B747-8, B787)
 - when new procedures are planned, in particular where aircraft operate differently than in the past (e.g. continuous descent of multiple aircraft into hub airports)
 - data source for intended recategorization of aircraft (and other concepts to change wake turbulence separation minima)
 - **... your ideas might be added here**
- Safety monitoring after change has been implemented.
- **... your ideas might be added here**

ICAO Recommendations

- Collection of information on wake vortex encounters announced in state letter AN 13/4-07/67 dated 26 October 2007.
- Owing to wake turbulence studies regarding the A380-800 the Airbus A380 Wake Vortex Steering Group suggested an 'overall review of wake turbulence provisions'.
- Member states should commence a wake vortex reporting scheme as soon as practicable.

<http://www.icao.int/fsix/wakevortex.cfm>

ICAO Wake Vortex Encounter Reporting Form

- Comprehensive and detailed questionnaire for pilots and ANSPs (20+ questions)
- pilots, aircraft operators, ANSPs should fill out the forms and submit them to *Regulator of the State of Occurrence*
- the Regulator is asked to transfer this data by means of an electronic form to ICAO

WAKE VORTEX ENCOUNTER REPORTING FORM FOR PILOTS

Date and Time	Date of incident		
	Time (UTC)		
Aircraft Type	Make		
	Model		
	Series		
Altitude	Height	<input type="checkbox"/> m or <input type="checkbox"/> ft	
	Altitude	<input type="checkbox"/> m or <input type="checkbox"/> ft	
	Flight level		
Geographic Position	Location		
	State		
	Airport		
	Runway	<input type="checkbox"/> L <input type="checkbox"/> C <input type="checkbox"/> R	
Details	Phase of flight	<input type="checkbox"/> take-off <input type="checkbox"/> initial climb <input type="checkbox"/> climb <input type="checkbox"/> cruise <input type="checkbox"/> descent <input type="checkbox"/> holding <input type="checkbox"/> approach <input type="checkbox"/> final <input type="checkbox"/> touch-down <input type="checkbox"/> taxiing <input type="checkbox"/> other	
	Were you turning?	<input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> L <input type="checkbox"/> R	
	Which holding pattern were you in, if any?		
	Were you:	<input type="checkbox"/> high <input type="checkbox"/> low <input type="checkbox"/> on the glide path	
	Were you:	<input type="checkbox"/> left of <input type="checkbox"/> right of <input type="checkbox"/> on the centre-line	
	Weight	kg	
	IAS	kts	
	Heading	degrees	
	Other	What led you to suspect wake vortex as the cause of the disturbance?	
	Did you experience vertical acceleration?	<input type="checkbox"/> yes <input type="checkbox"/> no	Please describe:
What was the change in attitude? Please estimate angle.	Pitch:		
	Roll:		
	Yaw:		

Topic 2: Existing Databases

- Can we deduce the frequency of wake encounters (per flight phase) from currently available data?
 - Is the level of reporting of wake turbulence encounters equivalent to the level of reporting of e.g. technical malfunctions, cockpit crew sickness?
- Have we fully exploited the available wake incident/encounter data?
 - Wake turbulence separations are considered overconservative in many conditions.
 - Separation greater than the respective wake turbulence separation minimum have not always been sufficient to avoid severe wake encounters.
- What is the critical success factor of the UK reporting scheme?

Topic 3+4: Analysis of Wake Encounters

- Do we/you feel to get sufficient number of reports?
- Do we/you feel that the current level of reporting yields a representative picture about the occurrence of wake encounters?
- Do we/you think that the information provided is sufficient and accurate enough?
- What is the motivation for analysing wake encounter data?
- Which means could ease reporting by pilots and air traffic controllers?

Topic 3+4: Hypotheses

- Data about wake turbulence encounters are rare not because of rare occurrence of wake encounters.
- Wake encounters are considered part of a pilot's regular business.
- Many encounters are not recognised as such.
- The majority of encounters are a felt to be a passenger discomfort issue rather than a safety threat.
- Pilots/air traffic controllers have only little possibility to take notes shortly after the incident.
- The benefit of reporting wake turbulence encounters is not known to aircrews and airtraffic controllers.
- **... what you suggest, to be assessed by the group**