WAKENET3-EUROPE

European Coordination Action for Aircraft Wake Turbulence

Funding: European (7th RTD Framework Programme)
Duration: Apr 2008 - Jul 2012
Status: Complete
Total project cost: €1,073,914
EU contribution: €900,000

Call for proposal: FP7-AAT-2007-RTD-1
CORDIS RCN : 89648

Background & policy context:
Safe separation distances prescribed to avoid potential hazards by aircraft encountering a preceding aircraft’s wake vortex are limiting airport capacity growth. Increasing airport congestion, the increasing diversity of aircraft types (e.g. the advent of Very Light Jets), the introduction of new large aircraft and the availability of new technologies have promoted extensive wake vortex investigations in recent years. These involve researchers, operational users (airports, pilots, airlines), air navigation service providers, regulators as well as aircraft and equipment manufacturers. The activities of the last decade have progressed from physical understanding of the wake vortex phenomenon itself to the development of new operational concepts and rulemaking. Airbus has been strongly involved in many of these research projects and has undertaken an unprecedented amount of flight tests (including several hundred deliberate wake vortex encounters) in order to help identify safe separation distances for its new Airbus A380. Other companies and research establishments have considerably helped to improve wake vortex detection and characterisation by remote sensing, as well as to better understand wake vortex physics, especially the meteorological influences on wake vortex behaviour and lifetime. See the section on EC-funded wake vortex research projects to gain an impression.

At the time of this project, wake vortex studies primarily related to the following two questions:

1. How can today’s rigid and fragmented systems of wake turbulence separation requirements be replaced by more flexible and even dynamic separation methods?
2. How can safety and capacity be increased with the help of ground-based and airborne advisory and detection systems?

To answer these questions and to gain the expected benefits, the new concepts had to be technically validated and proven as safe and operationally suitable. Like previous Thematic Networks, WakeNet3-Europe was intended to be the forum for the necessary communications, building a bridge between wake vortex research and operations, in order to get scientifically-funded agreements amongst stakeholders to help making new technologies usable for the air transport system. For this, WakeNet3-Europe organised annual workshops open to all interested parties, establish focused Task Groups and links to existing local stakeholder groups, professional groups, other projects and to US and other non-EU activities. From these activities, consolidated

Objectives:

The Coordination Action WakeNet3-Europe promoted multidisciplinary exchanges between research and operational specialists in the field of wake vortex turbulence. It enabled the development of a shared view on how to address capacity-related issues caused by wake turbulence. It continued the Thematic Networks WakeNet and WakeNet2-Europe. Safe separations were prescribed to avoid potential hazards by encounters with a preceding aircraft’s wake as these were a main limiting factor for airport capacity. Increasing airport congestion and the introduction of very large aircraft initiated extensive investigations, involving researchers, aircraft and equipment manufacturers and operational users (airports, pilots, ATC).
Two main questions were still open at the start of this project:

1. if the separations by MTOW could be replaced by a more physically based rulemaking,
2. if separations could be dynamically reduced with on-ground or on-board advisory and detection systems to increase airport capacity, both with constant or even increasing safety level.

In the last decade activities have progressed from physical understanding to development of operational concepts and rulemaking. Several EU-funded and other projects are ongoing or starting in this field. For successful concept implementation, acceptance by operational users was mandatory. This required continuous dialogue between scientists and users. Like previous Networks, WakeNet3-Europe was to be the forum for this dialogue, building a bridge between wake vortex research and operations, in order to get scientifically funded agreements amongst stakeholders to support implementation, and to help making new technologies (e.g. advisory systems) usable for wake vortex purposes. WakeNet3-Europe provided annual workshops open to the whole Wake Vortex community, established focused Task Groups and links to existing local stakeholder groups, professional groups, other projects and to US and other non-EU activities. Recommendations for future research and implementations were also to be elaborated upon.

**Parent Programmes:**
FP7-TRANSPORT - Transport (Including Aeronautics) - Horizontal activities for implementation of the transport programme (TPT)

**Institute type:** Public institution
**Institute name:** The European Commission
**Funding type:** Public (EU)

**Lead Organisation:**

**Airbus Operations Sas**

**Address:**
ROUTE DE BAYONNE 316
31060 TOULOUSE
France

**Organisation Website:**
http://www.airbus.com

**EU Contribution:** €108,800

**Partner Organisations:**

**Stichting Centrum Voor De Ontwikkeling Van Transport En Logistiek In Europa**

**Address:**
Van Nelleweg 1
3044 BC Rotterdam
Netherlands

**Organisation Website:**
http://www.cetle.org

**EU Contribution:** €93,325

**Universite Catholique De Louvain**

**Address:**
Place De L Universite 1
1348 Louvain La Neuve
Belgium

**EU Contribution:** €37,845

**Technische Universitaet Braunschweig**
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<td>Office National D'etudes Et De Recherches Aerospatiales</td>
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**Technologies:**
- Safety systems
- Wake management

**Development phase:** Validation

**Documents:**
- [2nd yearly report - CA Technologies (Other project deliverable)](http://www.dfs.de)

**STRIA Roadmaps:** Network and traffic management systems

**Transport mode:** Air transport

**Transport sectors:** Passenger transport, Freight transport

**Transport policies:** Safety/Security

**Geo-spatial type:** Other