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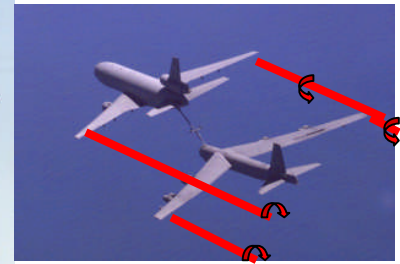
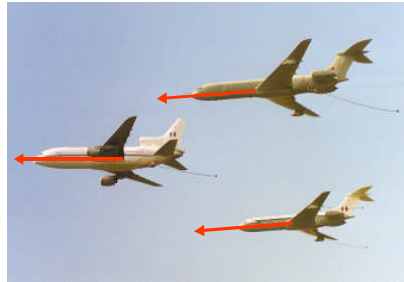
Invitation to an RAeS lecture in cooperation with the DGLR and VDI

Improvements for More Efficient & Greener Civil Aviation - Air to Air Refuelling & Close Formations

Dr. Raj Nangia CEng, FRAeS
Consulting Engineer, Bristol

Lecture
followed by discussion

Entry free !
No registration !



Date: Thursday, 31st March, 18:00
Location: HAW Hamburg
Berliner Tor 5
(Neubau), Hörsaal 01.12



Within three generations, civil aviation has dominated world transport. Growth has been upwards - bigger, farther and faster on an economic productivity basis. With increasing concerns of environmental issues and volatility in fuel price, NASA and ACARE (Europe) objectives imply reduction of aviation's environmental impact (fuel burn, noise, emissions) by 50% or more in 15 years.

A new set of "unified" Efficiency performance metrics relate the maximum and design Payloads, Fuel consumed and Unit Costs as functions of Range. These demonstrate how efficiencies decrease dramatically as range increases.

As aviation matures, propulsive, aerodynamic and structural efficiencies show smaller increments. The environmental objectives on an evolutionary basis become very costly and challenging. The pace of Research is however, increasing. With some lateral thinking, can we envisage a "step jump" by changing focus towards operational strategies? The pros and cons will be discussed.

In this context, Air-to-Air Refuelling (AAR), "multi-stage operations" and Close Formation Flying (CFF, drag reduction) are proposed, all have significant possibilities. It will be interesting to know / explore how these technologies may co-exist and compare with evolutionary technologies. For moderate to longer ranges, operational AAR and CFF together go most of the way towards satisfying NASA / ACARE objectives.

Dr Raj Nangia graduated from University of London with BSc and PhD in Aeronautical Engineering. He has worked with Hawker Siddeley, British Aerospace and at University of Bristol (Academic Staff & Research) He has been a Consulting Engineer for the past 20+ years working in several areas of Aerodynamics, Propulsion, Configurations, Projects, Ship Air-Wakes. He has been involved with BAESYSTEMS, Airbus, Rolls Royce, USAF, DTI, QinetiQ and DSTL. Recently, he has been a visiting Lecturer at the University of West of England in Bristol

RAeS Richard Sanderson
VDI Hannes Erben
DGLR Eric Heslop
DGLR / HAW Prof. Dr.-Ing. Dieter Scholz

Tel.: (04167) 92012
Tel.: (040) 743 83481
Tel.: (040) 743 62505
Tel.: (040) 42875-8825

events@raes-hamburg.de
hannes.erben@airbus.com
hamburg@dglr.de
info@ProfScholz.de

DGLR Bezirksgruppe Hamburg
RAeS Hamburg Branch
VDI, Arbeitskreis L&R Hamburg

<http://hamburg.dglr.de>
<http://www.raes-hamburg.de>
<http://www.vdi.de/2082.0.html>

und  Luftfahrtstandort
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<http://www.luftfahrtstandort-hamburg.de>

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