Scientific Research & Studies Relevant to Air Crew Fatigue

Note: This list, provided by ECA and ETF, compiles a wide range of scientific evidence on air crew fatigue that is publicly available, has been peer-reviewed and has informed national and international regulators and authorities, companies and aviation stakeholders over the past years and decades.

The Terms of Reference of EASA task OPS.055 mandate the drafting group to ‘take account of all relevant recent and publicly available scientific and/or medical studies/evaluations’. One of the most recent such evaluations is the so-called ‘Moebus Report’ whose authors assess a wide range of issues, using existing relevant scientific and medical evidence.

This report should therefore be the starting point and central basis for the drafting group’s work, complemented by selected relevant and publicly available other studies that fill areas not considered by the Moebus Report and/or that are more recent and update previous studies.


18. Niederl T, Vejvoda M, Maass H, & Samel A. Cumulative fatigue and work load effects on pilots during short-haul operations: subjected to work schedules and rosters. Submitted to Aviation, Space and Environmental Medicine, 2008.


B) References used by UK Civil Aviation Authority: CAA PAPER 2005/04, Aircrew Fatigue: A Review of Research Undertaken on Behalf of the UK Civil Aviation Authority; UK CAA 2005/07:


[34] Robertson KA, Spencer MB. *AIRCREW ALERTNESS ON NIGHT OPERATIONS: AN INTERIM REPORT*. QinetiQ Report No. QINETIQ/CHS/PPD/CR021911/1.0, March 2003.


[38] Spencer MB, Robertson KA, Foster SP. *A FATIGUE STUDY OF CONSECUTIVE NIGHTS AND SPLIT-NIGHT DUTIES DURING AIR CARGO OPERATIONS*. QinetiQ Report No. QINETIQ/KI/CHS/CRO40976/1.1, May 2004.


C) References used by UK Civil Aviation Authority: CAA PAPER 2003/8; A Review of In-flight Napping Strategies - Updated 2003


CAA PAPER 2003/8 A Review of In-flight Napping Strategies - Updated 2003 Page 28


22 Dahlgren K. Adjustment of circadian rhythms and EEG sleep functions to day and night sleep among permanent nightworkers and rotating shiftworkers. Psychophysiol 18(4):381-391, 1981.

23 DI Milia L. Exploring the utility of using longitudinal single subject case studies to examine the sleep of shiftworkers involved in a change from 8 to 12 hour rotating shifts. Shiftwork Int Newsletter 12(1):12, 1995.


42 Holmes SR. Summary of experimental research into the effects of sleep loss on decision making. DERA/CHS/PPD/WP000230, 2000.


CAA PAPER 2003/8 A Review of In-flight Napping Strategies - Updated 2003 Page 31


80 Rogers AS, Robertson KA, and Stone BM. *A land force’s guide to the management of irregular work/rest schedules*. DERA 1996.


D) References used in FAA Rulemaking Process:

[Note: The FAA did not yet make public its list of scientific studies & research used in developing the upcoming proposal for new, science-based FTL rules. Once available, this list will be updated]

The FAA held a fatigue management symposium in June 2008. Presentations are available at:
http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/afs/afs200/media/aviation_fatigue_symposium/aviation_fatigue_symposium.pdf

E) References used in Flight Safety Foundation Work on Ultra-long-range Operations:

[Note: FSF does not have a definitive list or document files of scientific research and studies on the topics of pilot fatigue / ultra-long-range and flight time limitations. Following is a list of reports and articles that have appeared in recent FSF publications. Reports and articles contain references to supporting documents and names of committee members, where appropriate.]


   Australian and International Pilots Association: Flight Crew Noise Exposure and In-flight Rest Facilities, 1998


F) Additional Studies / Research:

[1] Sleep during ultra-long range flights: a study of sleep on board the 777-200 ER during rest opportunities of 7 hours. Dr. Leigh Signal; Prof. Philippa Gander; Margo van den Berg
Research School of Public Health Massey University Private Box 756 Wellington, New Zealand May 2003.


[24] Concept design for supporting rest or sleep in public environments. AnnSofie Börjesson. A Master's project in Human computer interaction, at the Royal Institute of Technology (KTH) and Smart Studio, The Interactive Institute, 2002.

[25] Impact of Fatigue Related Scheduling Factors on Sleepiness in Aviators (2004) . Lucia Arsintescu1, Tammy T. Nguyen1*, Laura M. Colletti2, Amy Pritchett3, Melissa M. Mallis4, 5. 1San Jose State University Foundation; 2QSS Group, Inc; 3Georgia Institute of Technology; 4NASA Ames Research Center; 5Alertness Solutions *Posthumously.

[26] David Powell, Mick Spencer, David Holland, Elizabeth Broadbent, Keith Petrie: Study for Air New Zealand: Factors associated with aircrew fatigue in two-crew operations. 2007[?]


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