C. PARALLEL SESSION

OPERATIONAL EVIDENCE OF FATIGUE: FLIGHT OPERATIONS

June 17, 2008
14:15 – 15:45

Panel Overview

The *"Operational Evidence of Fatigue: Flight Operations"* session was chaired by Dr. Mark R. Rosekind of Alertness Solutions and included three presentations in which data from studies of flight crew in operational and flight simulator environments were reviewed. Dr. John A. Caldwell of Archinoetics, LLC began the panel by discussing the primary causes and symptoms of pilot fatigue with a specific focus on studies that have evaluated the effects of fatigue on piloting capabilities. Dr. Leigh Signal, of Massey University, continued the discussion of data collected during actual operations by reporting on the quantity and quality of bunk sleep during commercial ultra-long range (ULR) flights. Dr. Matthew Thomas, University of South Australia, closed the panel with a presentation on effects of fatigue on operationally relevant performance measures and identified gaps in the current knowledge of fatigue in aviation operations. The panel was intended to give an overview of the effects of fatigue on various performance measures in order to give the audience a broader understanding of how fatigue-induced decrements translate into operational performance challenges. Implications from empirical research were presented to help establish a science-based perspective on fatigue among flight crew.

One of the primary contributors of fatigue in flight crew is directly related to sleep loss associated with a variety of scheduling factors. Night flights have a high potential for fatigue because flight crew are operating at the circadian low point. Crossing multiple time zones results in jet lag and disruption in both sleep quantity and quality. Other operational factors including time pressure, increased workload, multiple flight legs, extended work periods, consecutive duty periods without sufficient recovery time, and multiple take-offs and landings also contribute to further sleep loss and degradations in performance levels.

In-flight scheduling factors affect the amount of sleep flight crew obtain during flight. Although increasing in-flight rest breaks seems likely to contribute to increased total in-flight sleep durations, data have shown that this is not always the case. This was demonstrated in the ULR data presented during the panel demonstrating that flight crew obtained approximately 3 hours sleep during a ULR sector, yet they had over twice this time available for sleep. Short rest breaks can also introduce challenges for flight crew when the opportunities are underutilized in obtaining sleep. Thus, it is important to understand how fight crew use in-flight rest periods and the quantity and quality of their sleep when scheduling the arrangement of bunk sleep periods.

While sleep quantity and quality during ULR flights have been objectively documented, it remains that little is known about the effects of such operations on operational performance. There is a need to understand the impact of such operations on performance and safety levels. As stressed by the panel presenters, multiple measures are required to accurately determine the cognitive status of flight crew and document the extent of performance decrements and its operational relevance in aviation environments.