"Fatigue Risk Management Systems (FRMS) within SMS"

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Abstract
The value of using a multi-layered approach to proactively addressing total system safety risk has been validated by a variety of aviation organizations. ICAO is now requiring regulatory authorities worldwide to implement Safety Management Systems (SMS). Integrating Fatigue Risk Management Systems (FRMS) as a component of an overall SMS provides another valuable layer of protection. ICAO has recently recognized this need and is developing an FRM SARP for incorporation into SMS as an alternative to prescriptive flight and duty time rules for Member States.

As a tool, FRMS can enhance both operational safety as well as flexibility. It is a natural component of an SMS because it combines a systematic framework of data analysis with non-jeopardy reporting. By requiring a data-driven approach for proactively managing fatigue, it addresses a major area of operational safety risk within any operator's SMS. When prescriptive duty/rest limits are relied upon to address fatigue, such levels of risk can only be assumed. The danger is that they imply a foolproof solution. They do not. By implementing FRMS carriers and air service providers no longer have to speculate about the level of safety risk resulting from decrements in operator alertness among flight crews, maintenance specialists, or controllers.

FRMS also enables operators to assess the likely impact of operational changes upon alertness before implementation. As a result organizations can seek more flexible and efficient operational alternatives than those

permitted under strict prescriptive rules. Because FRMS requires quantifiable outcome measures, regulators have access to a scientifically based method for assessing whether such alternatives will have unacceptable safety impacts. For new and novel operations, such as Ultra-Long Range Ops, where little consensus exists for prescriptive rules, FRMS can provide the scientific basis for new ops approvals.

While FRMS is often understood to be a scheduling or rostering tool, that view is too limiting. It is really a wider holistic risk management concept which incorporates all mitigation strategies, training and education, and performance measures integrated to manage crew or operator fatigue in a manner that promotes safe operations.

Main Points

- Describe how FRMS fits within the SMS concept.
- Understand some of the fundamental concepts of FRMS and the scientific tools that enable it.
- Provide an update on ICAO's progress developing an FRMS SARP.
- Explain the broader concept of FRMS in terms of fatigue mitigation strategies

A copy of Dr. R. Curtis Graeber's biographical information and presentation slides are provided in Appendix B.