



FRMS

Fatigue Risk Management Systems

Manual for Regulators

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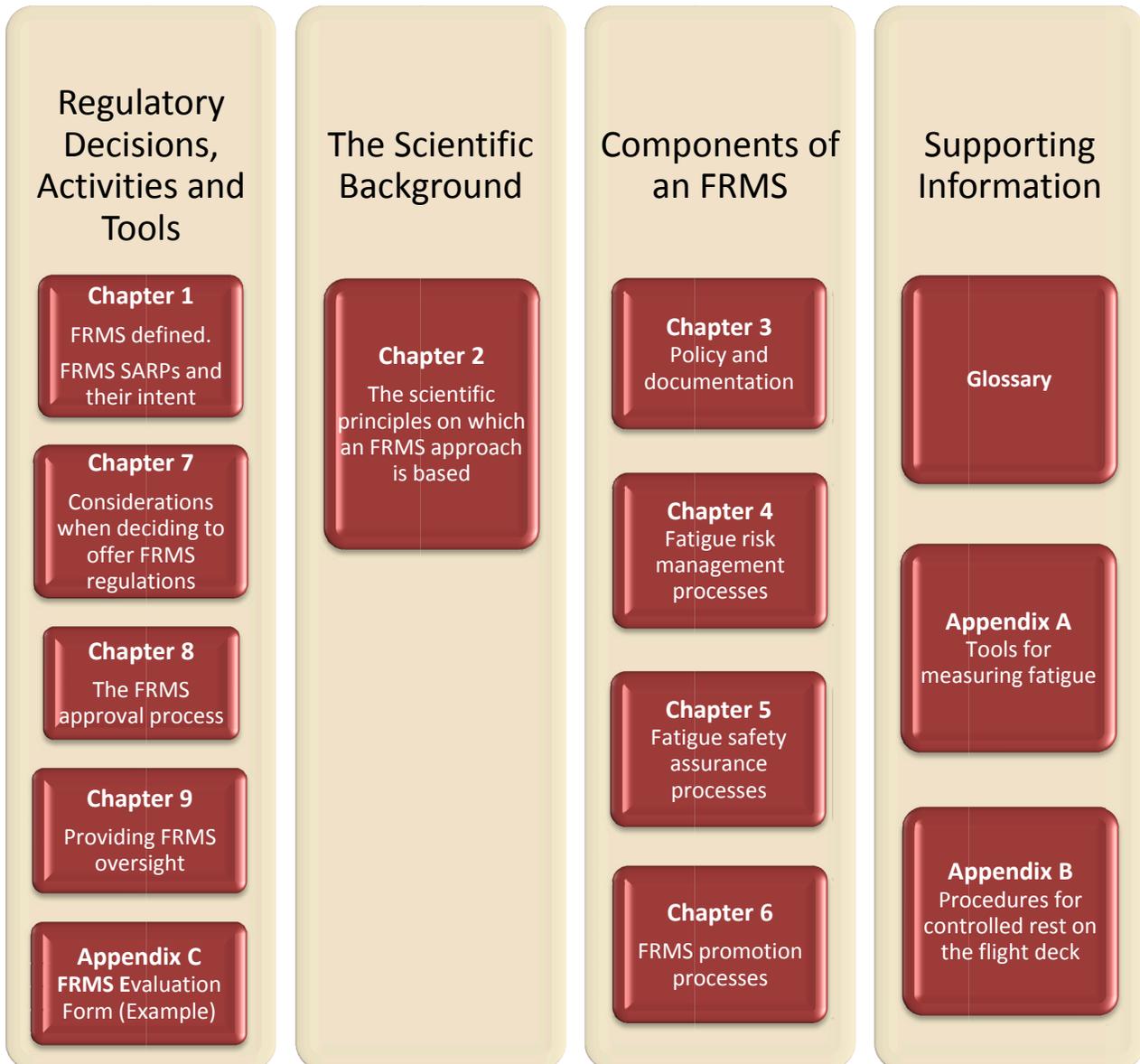
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OVERVIEW OF THIS DOCUMENT

The purpose of the FRMS Manual is to provide States with information on how an FRMS should function, its regulation and its oversight. The chapters in this document relate to different general areas as follows:



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GLOSSARY

* denotes an ICAO definition

Actigraphy. The use of actiwatches to monitor sleep patterns. For actigraphy to be a reliable measure of sleep, the computer algorithm that estimates sleep from activity counts must have been validated against polysomnography, which is the gold standard technology for measuring sleep duration and quality. The main weakness of actigraphy is that sleep and still wakefulness look the same on an actigraph (since an actiwatch measures movement).

Actiwatch. A wristwatch-like device containing an accelerometer to detect movement. Activity counts are recorded per unit time, for example, every minute. The patterns of movement can be analysed using purpose-built software to estimate when the wearer of the actiwatch was asleep and to provide some indication of how restless a sleep period was (i.e., sleep quality). Actiwatches are designed to record continuously for several weeks so they are valuable tools for monitoring sleep patterns, for example, before, during, and after a trip. Actiwatches provide graphs of movement as output (actigraphs).

Afternoon nap window. A time of increased sleepiness in the middle of the afternoon. The precise timing varies, but for most people it is usually around 15:00 to 17:00. This is a good time to try to nap. On the other hand, it is also a time when it is more difficult to stay awake, so unintentional micro-sleeps are more likely, especially if recent sleep has been restricted.

Augmented flight crew. A flight crew that comprises more than the minimum number required to operate the aeroplane so that each crew member can leave his assigned post to obtain in-flight rest and be replaced by another appropriately qualified crew member.

Augmented long-range operations. Flights where the flight duty period is extended through the use of augmented crews, allowing crew members the opportunity for in-flight rest.

Biomathematical model. A computer programme designed to predict crew member fatigue levels, based on scientific understanding of the factors contributing to fatigue. All biomathematical models have limitations that need to be understood for their appropriate use in an FRMS. It is an optional tool (not a requirement) for predictive fatigue hazard identification (ICAO Annex 6, Part 1, Appendix 8, Section 2.1).

Chronic fatigue. In fatigue risk management, chronic fatigue refers to the sleepiness and performance impairment that accumulate when sleep is restricted day after day. These effects can be reversed by obtaining adequate recovery sleep (also see cumulative sleep debt).

Chronic fatigue syndrome. A medical condition, the diagnosis for which requires a person to meet two criteria:

1. Have severe chronic fatigue for at least six months or longer that is not relieved by rest and not due to medical or psychiatric conditions associated with fatigue as excluded by clinical diagnosis; and
2. Concurrently have four or more of the following symptoms: self-reported impairment in short-term memory or concentration severe enough to cause substantial reduction in previous levels of occupational, educational, social or personal activities; sore throat that is frequent or recurring; tender lymph nodes in the neck or armpits; muscle pain; multi-joint pain without swelling or redness; headaches of a new type, pattern or severity; unrefreshing sleep; and post-exertional malaise (extreme, prolonged exhaustion and sickness following physical or mental activity) lasting more than 24 hours.

The fatigue and impaired memory or concentration must have disrupted normal daily activities, along with other symptoms that must have persisted or recurred during six or more consecutive months of illness and must not have predated the fatigue. (http://www.cdc.gov/cfs/general/case_definition/index.html)