ASOS Research Brief

Research Request:

We generated a hazard report about a 2-pilot crew (with an engineer) resting on a long flight (mostly ocean crossings). Is there any precedent to getting some rest on the flight deck in this situation? Our standards group thinks napping, as well as leaving the flight deck, is contrary to the FARs. Informal polling tells me other operators allow a nap, but I have no idea if they actually wrote out a procedure in their policy manual. Can you tell me if there is any way we can lower the risk of a tired crew with some sort of rest protocol on a long flight?

Research Response:

Current FARs

Based upon the current regulation under the FARs, it is not legal for a crewmember to take naps while in a crew seat in the cockpit during any time of the flight of an aircraft requiring two crewmembers. FAR 91.105 states:

> Sec. 91.105
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> Flight crewmembers at stations.
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> (a) During takeoff and landing, and while en route, each required flight crewmember shall--
> (1) Be at the crewmember station unless the absence is necessary to perform duties in connection with the operation of the aircraft or in connection with **physiological needs**; and
> (2) Keep the safety belt fastened while at the crewmember station.
> (b) Each required flight crewmember of a U.S.-registered civil aircraft shall, during takeoff and landing, keep his or her shoulder harness fastened while at his or her assigned duty station. This paragraph does not apply if--
> (1) The seat at the crewmember's station is not equipped with a shoulder harness; or
> (2) The crewmember would be unable to perform required duties with the shoulder harness fastened.

The definition of “physiological needs” according to the FAA Chief Counsel is using the restroom, stretching during a long flight, or similar needs. The length of the absence will depend on what is reasonable under the circumstance of a given situation. (FAR’s Explained, by Kent Jackson). It is highly unlikely an SOP allowing a required crewmember to sleep while at their station would be approved by the FAA. The FARs may be interpreted various ways so consult with your local FSDO to clarify before implementing any cockpit rest procedure.

Currently, it is not legal for a Part 121 or Part 135 operators to conduct cockpit naps. Most operate with augmented crews for long-haul flights. Other operators pre-position crews for long flights at locations such as Shannon, Ireland or Anchorage, Alaska for flights across the Atlantic or Pacific. Crew augmentation is considered a best practice for long haul operation, and is widely used by the airlines and part 91 flight departments.

NASA Study

In 1994 NASA conducted a study titled: Crew Factors in Flight Operations IX: Effects of Planned Cockpit Rest on Crew Performance and Alertness in Long-Haul Operations. This study examined the effects of cockpit rest using a group of 21 pilots from two volunteer airlines. Controlled rest periods of 40 minutes were conducted under the observance of NASA researchers during cruise. The report concluded the planned rest periods or naps, "...appeared to provide an effective, acute relief for the sleepiness experienced in non-augmented three-person long-haul flight operations." The naps were not designed to substitute sleep debt, but increase alertness for operational tasks. The naps were also only conducted during cruise operations, and within very specific parameters. In order to address safety concerns, the report listed several guidelines (please see page 67, #6 of the report). In regards to safety the report stated, "There were no reported or observed events that suggested the cockpit naps adversely affected any operational parameters." Cockpit naps have yet to be officially approved.

Alertness Management

There are preventative measures and operational measures for alertness management. It is important to remember the root of the cause is sleep debt, and there is nothing that can alleviate sleep debt besides sleep. Even short naps are not a solution for sleep debt. Duty time, scheduling, aircraft technology and personal health are some of the major factors in managing fatigue and sleep debt. Examples of preventative measures include:

- Quality sleep prior to trips
- Developing a routine to aid in quality sleep
- Creating an environment conducive for sleep
- Avoiding caffeine and alcohol prior to sleep
- Fatigue education
- Relaxation techniques

In terms of operational countermeasures, it is important to remember they will only mask fatigue effects and are generally physical in nature. These countermeasures included:

- Stretching in the cockpit
- Social interaction
- Strategic use of caffeine
- Proper nutrition and hydration
- Performing flight-related calculations

For more information regarding alertness management please refer to the NASA document entitled: Crew Factors in Flight Operations XIV: Alertness Management in Regional Flight Operations.
Another excellent for crew rest guidelines is the Flight Safety Foundation report: Principles and Guidelines for Duty and Rest Scheduling in Corporate Aviation.