BOARD MEMBER STATEMENT

Loss of Control, Sundance Helicopters, Inc., Eurocopter AS350-B2, N37SH,
Near Las Vegas, Nevada – December 7, 2011

Member Mark R. Rosekind
Concurring Statement

On December 7, 2011, a Sundance Helicopters, Inc., helicopter operating on a "Twilight Tour" sightseeing trip crashed in mountainous terrain about 14 miles east of Las Vegas, Nevada. The pilot and four passengers were killed, and the helicopter was destroyed. The safety issues identified in this accident investigation included the fatigue experienced by both the mechanic and the quality control inspector. For both individuals, fatigue was due to insufficient time to adjust to working an earlier shift than normal. Also, the mechanic had an inadequate amount of sleep and the inspector had a long duty day, both of which also contributed to the development of their fatigue. The investigation found that their performance was degraded by fatigue, which contributed to securing the fore/aft servo connection improperly, and their failure to identify this deficiency in the post-maintenance inspection of the accident helicopter.

Maintenance Personnel Duty Limits – Long Overdue

Addressing the need for maintenance personnel duty limits is not a new issue. The NTSB has had longstanding concerns about the effects of fatigue on all safety-critical operations including maintenance. Over 15 years ago the Board issued Safety Recommendation A-97-71 that asked the FAA to review fatigue in aviation maintenance personnel and then establish duty-time limitations consistent with the current state of scientific knowledge. This recommendation resulted from a 1996 accident in which ValuJet flight 592 crashed into the Everglades shortly after takeoff from Miami International Airport. The crash was caused, in part, by the aircraft inspector's fatigue due to extended duty time. The FAA subsequently responded to the NTSB that because of a lack of scientific data in this area it would expand its human factors research program to include studies regarding duty length and shift scheduling. At the conclusion of this research, the FAA was to implement an appropriate policy or regulatory change.

In that decade and a half since the issuance of Safety Recommendation A-97-71, the FAA has conducted additional research regarding the fatigue effects of duty length and shift scheduling with results that show substantial decreases in cognitive performance, reductions in attention, and degradations in memory. Even with this additional information, the agency has not acted to address this issue or the 15-year old NTSB recommendation. As a result, at the Sundance Helicopter accident Board Meeting, Safety Recommendation A-97-71 was classified "Closed – Unacceptable Response" and was superseded by a new safety recommendation A-13-[1] that was classified as "Open – Unacceptable Response."

In the intervening 15 years, there is an even more robust base of scientific knowledge and industry best practices to substantiate the fact that duty-time limitations is a critical strategy for reducing the risks of fatigue in aviation maintenance. Much of this science led to, and is the basis for, the FAA's new hours of service rules for flight crews that were issued in December of 2011.

Fatigue is fatigue and a tired maintenance employee suffers from the same performance decrements experienced by a tired pilot. The alertness of both is crucial to safe aircraft operations. As the FAA said in its hours of service rule, "Fatigue threatens aviation safety because it increases the risk of pilot error that could lead to an accident." This is particularly a concern for crews that fly "…on the back side of the clock." Maintenance personnel can easily be substituted here for "pilot" and "crew;" fatigue creates parallel risks to flight safety for all humans involved in any aspect of operations.

The time is long overdue for the FAA to issue duty-time regulations for maintenance personnel that take into consideration factors such as start time, workload, shift changes, circadian rhythms, adequate rest time, and data shown by recent research, scientific evidence, and current industry experience to affect maintenance crew alertness.

Human Factors Training – Critical Complement to Duty Limits

Duty limits are necessary to ensure maintenance personnel alertness and operational safety, but they alone are insufficient. A comprehensive and complementary strategy for reducing the risks of fatigue in aviation maintenance must go beyond duty limits and include human factors training for all maintenance personnel. Based on the Sundance helicopter accident, the NTSB recommended that this human factors training be required, and include fatigue education and training on: 1) the causes of fatigue; 2) its effects on performance; and 3) actions individuals can take to prevent the development of fatigue. Like duty limits, this training is long overdue.

As a result of the 2003 US Airways Express flight 5481 crash at Charlotte-Douglas International Airport, the NTSB issued Safety Recommendation A-04-16 for the FAA to require that Part 121 air carriers implement comprehensive human factors programs to reduce the likelihood of human error in aviation maintenance. In the intervening nine years, the FAA has developed substantial guidance for the industry about maintenance human factors and has repeatedly stressed the importance of human factors training as a way to address the intent of this recommendation. Yet there remains no requirement for human factors training for maintenance personnel involved in air carrier operations. Safety Recommendation A-04-16 remains classified as "Open – Unacceptable Response."

Even though the FAA issued a notice of proposed rulemaking last year that would someday require repair stations to provide human factors training for employees performing maintenance, preventive maintenance, alterations, or inspection functions, these regulations would not include maintenance personnel working for Part 121 and 135 operators or Part 91 Subpart K programs. Based on the Sundance Helicopter accident, the NTSB reiterated Safety Recommendation A-04-16.

The Sundance investigation illustrates that human factors training for ALL aircraft maintenance classifications, including the type of fatigue training outlined above, is essential for reducing the likelihood of human error in aviation maintenance. The nine-year old outstanding, unacceptable status of Safety Recommendation A-04-16 on human factors training needs action.

Conclusion

Aircraft maintenance personnel have an invaluable role in safe aircraft operations, with their work often conducted "behind the scenes." This Sundance Helicopter accident highlights that their work is equally important to the work performed by the more visible pilot and flight crew. It is unacceptable that the duty limits and training opportunities for maintenance personnel have not kept pace with what is required of their other industry colleagues. No matter how accomplished and professional the Sundance helicopter pilot was, the deficiencies in the fore/aft servo connection – in part due to maintenance personnel fatigue – resulted in an unrecoverable crash. By acting on the NTSB Safety Recommendations on duty limits and human factors training in this report, the industry can make real progress to prevent future accidents of this kind and the resulting loss of life. Maintenance errors have been the cause of numerous tragedies over the course of aviation history, and it is unacceptable to wait another decade or more before regulations, duty-time limitations, and human factors training fully recognize and address the known safety gaps.