SMS for Helicopter Maintenance

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There tends to be an erroneous perception in the helicopter maintenance community that a Safety Management System (SMS) along with certain maintenance procedures are incompatible with one another. Often, many think these safety elements are an unnecessary duplication of effort. This cannot be further from the truth and this Safety Bulletin is provided to counter this perception.

Accident Analysis

The European Helicopter Safety Team (EHEST) analyzed 311 accidents that occurred between CY2000 and CY2005. Of these accidents, maintenance was identified as a contributing factor in 14 percent of the events. The IHST's Joint Helicopter Safety Analysis Team (JHSAT), based in North America, conducted a similar study to see if there were similar trends in other parts of the world. In their study of accidents occurring in CY 2000, 24 percent of the accidents analyzed identified maintenance as a causal factor. A subsequent study revealed that 19 percent of accidents occurring in CY2001 involved inadequate or improper maintenance.

Another important accident causation category highlighted in the year 2000 JHSAT study involved Parts and Systems Failure. The study identified improper maintenance practices as the cause of 86 percent of these events. The primary issue was failure to follow approved instructions for continued airworthiness; i.e., failure to follow standard and approved maintenance procedures. The point that needs to be emphasized is that maintenance activities, or lack thereof, plays a

significant role in accident causation and the helicopter industry needs to find ways to prevent those types of events from happening. The IHST Maintenance Toolkit is an excellent reference and it offers several countermeasures to consider towards reducing risk exposure in maintenance activities.

SMS Defined

No definition of SMS specifically excludes maintenance; quite the contrary. The Federal Aviation Administration (FAA) has defined SMS as: "SMS is the formal, top-down business approach to managing safety risk, which includes a systemic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures" (Order VS 8000.367). The International Civil Aviation Organization (ICAO) definition is similar, "A safety management system (SMS) is a systematic approach to managing safety, including the necessary organizational structures, accountabilities,

policies and procedures." The International Business Aviation Council (IBAC) has created the International Standard for Business Aircraft Operations (IS-BAO) based on ICAO Document 9859 to serve as a guide. IS-BAO very specifically addresses the four pillars of SMS as being applicable to not only operations, but to all aspects of the business including maintenance. As such, there is a reasonable expectation from regulatory agencies and international standards that maintenance personnel will be an integral component to an organization's SMS process.

SMS Ensures Good Maintenance Performance
A formal SMS requires training for specific missions, the establishment and enforcement of standard operating procedures (SOP), provisions and training of personnel to use risk assessment tools, and most importantly, a focus on changing the safety culture to ensure that all maintenance personnel put safety first above all else. An organization needs to develop and sustain a formal process that ensures analysis, assessment and control of safety risks in maintenance operations. Through this continuous improvement process risk exposure will be reduced with the secondary benefits of improved quality and enhanced performance.

Maintenance Safety Policy
By following the overall framework established in a well implemented SMS, specific standards for maintenance activities that also conform to the organization's safety policy may be easily demonstrated with minimal operational impact. It is also imperative that operators ensure their contract maintenance vendors also share in this methodology to better extend your risk mitigation activities to personnel outside your organization who can contribute to errors in your system.

Safety Assurance
Risk identified in maintenance activities may be effectively managed by placing controls to mitigate and/or avoid such risks. Safety assurance is the method by which those controls are monitored to ensure that they are beneficial and are being followed. It is essential that the organization leadership and general personnel be informed of event investigations and the corrective actions to help verify the results of the safety assurance process.

Management of Hazards
Hazards to good maintenance may be managed through a functional SMS. Examples of these threats may include distractions or fatigue. There is an increasing awareness that fatigue is a significant risk factor influencing maintenance activities that has received little attention in the past, but can lead to significant consequences.

Safety Promotion
To have an effective SMS, the organization must ensure that safety promotion involves maintenance personnel. A great example of safety promotion would be that findings/corrective actions of a hazard report are disseminated to all via email or messaging system. Enabling everyone to be aware of what events have occurred and what mitigation was implemented to prevent reoccurrence is critical.

Management of Change
A process that evaluates the potential affect a change might have on the level of safety throughout the organization is an important component to your SMS. A maintenance process change could inadvertently have a negative effect on your operation if not proactively reviewed to identify the risks.

Conclusion
An organization's maintenance leadership is an essential part of the team for the successful implementation of an SMS. This positive outcome will also be incumbent upon the inclusion of all maintenance personnel and will help to ensure risk is properly targeted and managed. In addition, with SMS sustainment supported by an ongoing improvement process, with measured progress your maintenance personnel will be able make definitive contributions and see the value they have provided. It is highly recommended that further information be obtained on this subject. A particularly useful resource is the International Helicopter Safety Team (IHST) document "Maintenance Toolkit"