

46th SYMPOSIUM ON SAFETY AND QUALITY IN SPACE ACTIVITIES (D5)
Insuring Quality and Safety in a Cost Constrained Environment: Which Trade-Off? (1)

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QUALITY AND SECURITY MANAGEMENT SYSTEMS

Abstract

Design, building and operation of complex space, aeronautical or nuclear systems require robust, high-performance quality systems. These systems are designed so that the quality level achieved for the components of these systems is in line with their criticality... This covers, in particular, risk analysis and hazard study techniques. Based on this criticality assessment, appropriate quality assurance plans, are then defined and applied to the development of each of these components. We all agree about the fact that it is the application of this type of approach which yielded the convincing safety results achieved during the second half of the 20th century: Nuclear security, Certification of transport aircraft, space launch safety regulations. However, application of these provisions has not prevented the occurrence of dramatic accidents on proven systems: the two space shuttle accidents and the crash of the Air France 447 flight are distressing examples... Conformance is not a one-size-fits-all solution to every problem.

The Safety Management Systems recently set up as part of aeronautics operations constitute the formalisation of a safety culture which, in particular, is apparent in the human factor management. The purpose of these systems is to prevent the hazards associated with routine operations: -Schedule-induced pressure, -Habits, -Lack of awareness of safety, -Turn over -Lack of communication regarding safety. The goal is therefore to establish a link between anomalies and deviations observed daily, and their consequences for the safety, in order to implement appropriate corrective actions. In order to implement a safety management system, an operator must: -Define a safety management policy; -Manage risks, in particular by identifying hazards, and by assessing and minimising the associated risks through the implementation of appropriate actions including improvements of training programs -Ensure that safety is maintained, in particular through the monitoring of his performance with respect to safety and to any change that might affect it -Promote safety and maintaining risk awareness among the employees involved.

We must think about the implementation of such systems as part of the most dangerous space operations, which naturally include manned flights, but also launch operations. These operations have now become repetitive, subject to demanding scheduling and economic constraints, which are liable to have an impact on the way weak, safety-related signals are taken into account. An appropriate processing must be applied as part of the organisation of the operations, to prevent this risk of regression.