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A System Safety Approach to the FAA Surveillance Process

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Abstract

As commercial air travel grows in terms of the number of passenger miles flown, there is expected to be a corresponding dramatic increase in the absolute number of accidents. This despite an enviable safety record and a very low accident rate. The political environment is such that an increase in the absolute number of accidents is not acceptable, with a stated goal of a factor of five reduction in the aviation fatal accident rate within ten years. The objective of this project is to develop an improved surveillance process that will provide measurements of the current state-of-health and predictions of future state of health of aircraft, operators, facilities, and personnel. Methodologies developed for nuclear weapon safety, in addition to more well known system safety and high-consequence engineering techniques, will be used in this approach.

This project is concerned with Part 121 surveillance and applies system safety and high-consequence system engineering techniques and tools, including those developed by Sandia National Laboratories for assuring the safety of nuclear weapons.

Surveillance is one of the most significant duties of the FAA toward its larger responsibility of assuring air transportation (Part 121) safety. The *Process Quality Management Improvement (PQMI)* methodology was used to define the current surveillance process in order to understand the existing system, customer requirements, and system requirements. This understanding led to the conclusion that effective surveillance must be founded upon a system safety approach encompassing both surveillance of the carrier and the FAA process to certificate and to manage the certificate. A unique Sandia tool was used to center the reengineered surveillance process on safety and move it toward the new paradigm expressed in the *Gore Commission Report*.

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Problem

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