

AS9100:2009: Managing Risk in Manufacturing



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Manufacturers servicing aviation, space, or defense programs require a level of infrastructure capable of managing them.

Printed circuit board (PCB) manufacturing is moving rapidly up the technology ladder. Keeping internal processes current (and compliant) with new requirements, without disrupting existing customer demands, presents ongoing risks. To minimize potential failures, it is necessary to identify and manage these risks. The new version of the aerospace quality management system standard AS9100:2009 (Revision C) requires companies to assess and manage the risks involved with providing their product or service. Risk is defined in the standard as “an undesirable situation or circumstance that has both a likelihood of occurring and a potentially negative consequence.”

Risk identification

Risk management consists of identifying those potentially undesirable situations, assessing their probability of occurring, understanding what the impact may be should the event happen, and determining what to do if the risk level is too high. Situations can be defined as failures and defect rates can be used to identify risk potential. The situations with the greatest defects are audited using a failure mode effects analysis (FMEA) rating system shown in figure 1. The results rate the level of risk, the likelihood of occurrence, and the consequence.

Likelihood of Occurrence	Consequence if Event Occurs				
	Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
Almost Certain 5	H	H	E	E	E
Likely 4	M	H	H	E	E
Moderate 3	L	M	H	E	E
Unlikely 2	L	L	M	H	E
Rare 1	L	L	M	H	H

Risk Levels: E = Extreme H = High M = Moderate L = Low

Figure 1: Risk level assessment matrix

Event definition

Manufacturing PCBs involves dozens of activities requiring compliance to quality standards, and conformance to performance specifications and customer procurement documentation. Events can be associated with processes, products, and services related to any or all of these activities. Process events can relate to performance metrics (yield, throughput, etc.). Product events can relate to conformance metrics (inspection, testing, etc.). Service events can relate to satisfaction metrics (on-time delivery, quality conformance, etc.).

Events can be defined by customer, IPC product type (1, 2, or 3), IPC performance requirement (1, 2, 3), technology type (high density, conductive via fill, special, etc.), or a combination of all. Event definitions and risk levels should be defined and managed from design to delivery. Risk management is a quality standard requirement for aviation, space, or defense markets as well as sound business practice.

Risk management

Manufacturers servicing aviation, space, or defense programs require a level of infrastructure capable of managing them. Each program can be quite large and complex, involving multiple suppliers or partners and take place over a long time period. To be successful, program management has to plan, execute, and control risk.

Planning begins by identifying risk at the quoting phase. Winning an order on price only to lose it at contract review can have serious repercussion. AS9100:2009 will promote additional focus on up-front planning and encourage adequate controls throughout the whole “product realization” process to meet

schedules and stay within resource constraints. There are new requirements of implementation of a risk management process applicable to the processes and products including responsibility, criteria, mitigation, and acceptance procedures.

Customers want professional-grade quality management in their suppliers. Suppliers must execute a management plan that proves they are aware of, and capable of, controlling quality and the risk concerns of the customers. Standards provide effective management plans for controlling an enterprise, but they require implementation, corporate commitment, and compliance to be effective. Registration to and implementation of AS9100:2009 will provide a positive return on investment and lend credibility to your value proposition.

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