



Best Practice Statistical Quality Control

SCOPE OF THIS PRACTICE. Statistical Quality Control (SQC) programs are considered part of the manufacturer's overall quality system. However, there is no regulatory requirement for establishing an SQC program, and establishing such a program based on the information provided in this document is voluntary. The Federal Aviation Administration (FAA) encourages such a program to help reduce nonconformances, process variation, scrap, and to improve product quality.

BACKGROUND. In June of 2006, the SAE G-3 Committee requested FAA comment on a new Aerospace Recommended Practice (ARP) for Quality Conformance Inspections. This practice, ARP-9013, represented a departure from past FAA-recommended practice. This recommended standard is in fact the best practice today. Our analysis of ARP-9013, as issued in October of 2005 follows.

We found the Initial Reliability Requirement (IRR) to be a significant upgrade and replacement for the long-standing Acceptable Quality Level (AQL) values which we have been using since the 1940's. We frequently found AQL's misused by industry, to include inappropriate application to isolated lots for which they were never intended. As is the case with the Department of Defense, we no longer find the use of AQL values desirable. Furthermore, IRR and Zero Defectives go hand-in-hand; hence we heartily support the switch to IRR.

In addition, ARP-9013 provides specific procedures for isolated lots and more advanced sampling plans that were not previously available, both significant improvements on their own merits.

Finally, we found full implementation of the safeguards designed for use of Statistical Process Control (SPC) adequate to allow its use for product acceptance purposes. This represents a departure from our previous stance on SPC for product acceptance, and comes with the realization that a significant training investment will be required on the part of manufacturers. However, it represents an opportunity and incentive to gain higher fidelity for the metrics used to measure and ensure product quality. Again, with full implementation of the safeguards noted in the recommended practice, SPC will result in continuous process improvement, one of the very tenets of the FAA's Aviation Safety Quality Policy.

CONCLUSION. In short, this ARP can be the industry 'Best Practice for Quality Conformance Inspections' as it is today. Its adoption by the aviation industry will reduce risk, encourage continuous process improvement, and ultimately result in greater safety for the National Aerospace System.

Nothing follows.