

Qualification in a World without QPLs

By Bob Neves

As the system changes, military users and vendors transform their relationship by utilizing a more productive exchange of information.

The importance of the Qualified Products Lists (QPLs) has been ebbing over the last several years. The current trend to commercialize the military procurement process has recently gotten a boost by the rash of military specification cancellations. The goal of the QPL program was to have a list of audited suppliers from which the military user could purchase. The QPL system was the military's way of assuring end product quality by having a manufacturer perform a series of qualification tests, and then constant end product tests.

This worked in theory, but users found that they had to perform audits of their own, and could not buy directly

from the QPL due to PWB product complexity and inconsistency. They used the QPL as a sorting list to limit the number of sources to audit. This limited the effectiveness of the QPL and, subsequently, the need for a QPL list, has diminished greatly. The idea of assuring product quality at the end of the line has a number of faults which have been proven out over the years. Philosophies of how to assure product quality have changed toward process control, and the current QPL program based upon end product parameter control has outgrown its usefulness.



The military office in charge of the QPLs for the electronics industry has realized this change in quality focus and adjusted by participating in a program called the Qualified Manufacturers List (QML). A key concept to this program is a strong working relationship between the manufacturer and the government qualifying activity. The QML program differs radically from the QPL program in a sense that a manufacturer's facility is first certified prior to the qualification of product parameters. The certification portion of the QML program involves an ISO 9000-like facility audit and, in fact, participants in the MIL-PRF-31032 (formerly known as MIL-P-RRRRR) program can request an ISO 9000 audit from the trained government lead auditors. Once a manufacturer is certified, he can then begin qualification of product parameters. The program for qualification is defined by the manufacturer to demonstrate all product parameters that he would like in the QML listing. The QML program is currently active for monolithic and hybrid microcircuits, discrete semiconductors, and will soon be implemented for printed wiring.

The need for commercial performance specifications in the PWB industry has been filled by the Institute for Interconnecting and Packaging Printed Circuits (IPC). The IPC's task groups and committees of industry people have created a set of performance documents for all suppliers of printed wiring products, from raw materials to finished PWB assembly. These standards currently contain a qualification program similar to the military's QPL program. The QPL program has worked in the military system because there is a recognized body which administers the program, performing audits, reviewing test results and maintaining a master list of QPL-approved sources. Over the last several years, the IPC has tried to implement several different administrative systems to accomplish this, but due to a variety of issues and lack of industry support, each effort has ended in failure.

A new direction for the commercial qualification program was necessary, and it was out of that need that a task group was formed from the IPC's Technical Activities Executive Committee (TAEC) to address the qualification program. The group examined the failure of previous efforts and the way that initial qualifications are currently being accomplished. Initial qualification was identified as a way to reduce the risk associated with using a new supplier. The first step in the qualification process is to have the supplier perform a "self-declaration." The self-declaration is the supplier's way of letting the user know what his capabilities are in both quality and production parameters. This data currently takes on the form of marketing brochures, data sheets and full supplier survey forms, which are different from company to company.

An effort to standardize this information was taken up by the IPC's OEM Council which came up with the manufacturers profile document titled IPC-1710. This in-depth profile contains information about the suppliers site capability, equipment, technology specifics, quality profile, manufacturing history, previous audit and accreditation history. The IPC-1710 originated out of the need to reduce the number of audit and survey forms currently inundating PWB suppliers. Efforts within the IPC

are currently underway to come up with manufacturers' profiles for all PWB industry supplier segments.

The next step in this information standardization effort is to make this wealth of data easily available and "sortable" so a user can match a supplier to his needs. The IPC long-range planning committee has recommended that this information be collected from its membership and made available to users in a useful and sortable fashion. If this recommendation is adopted by the IPC, it is possible that this information could be available on the IPC's new world wide web site (<http://www.ipc.org>). This method would provide a forum for matching suppliers to users in a very efficient manner.

Self-declaration without verification still leaves a unacceptable risk to most manufacturers. Part of the qualification process is method of verifying self-declaration parameters. Production parameter data verification can come from a variety of sources such as production data, independent lab or customer test results. The source of quality parameters can come from Self, Customer or Independent facility audits. Each user will have a different level of comfort with the type of verification parameters and information provided by a supplier. Previous commercial qualification efforts have failed because they did not allow for the unique differences in the needs of users and suppliers.

Audits of a supplier's facility can lend a wealth of information about the quality and process control a supplier has on his product. Unfortunately, facility audits are costly in both dollars and man hours. The ability to view a supplier's audit history can provide users with enough information to reduce or eliminate any redundant audit functions, thereby saving cost. There are also efforts under way to reduce and combine audit functions by users with like needs. One good example of the effort to pool audit resources is the Big Three automakers combining their quality and audit functions into their QS9000 system.

The commercial qualification program concepts stated here are being placed into the new revision of IPC-RB-276 currently under construction. These are fundamentally different concepts, and are likely to raise much comment from various segments of the industry. This is a complex issue, and everyone's needs are slightly different. As the IPC's Rigid Board Committee chairman, I would urge anyone with concerns to participate in this effort, so that we can provide a useful qualification program for the future of our industry.

Bob Neves has been the director of technical services for Microtek Laboratories for the last ten years. He currently serves as the IPC's Rigid Board General Committee chairman, Rigid Board Test Method Task Group chairman, Laboratory Qualifications (IPC-QL-653) Committee chairman, Member of DESC's Tiger Team for MIL-P-RRRRR (MIL-PRF-31032), Member of Blue Ribbon Committee for MIL-S-XXXXX (MIL-PRF-5X) and Convenor of IEC TC52 Working Group 10 Printed Wiring Test Methods.