



PRODUCT INTEGRITY VERIFICATION GIVES YOU THE EDGE

INTEGRITY IS ONE OF THE MOST IMPORTANT attributes a company can possess these days, when customer service and loyalty are key business concerns. But what about product integrity? While it's certainly important to practise integrity at the service level, it is also paramount to deliver a product that demonstrates integrity to its design objectives and demonstrates a company's commitment to providing the customer with the highest quality product possible. Product integrity can therefore be crucial to differentiating your company in a highly competitive marketplace, giving your company the edge!

A product integrity verification cycle seeks to ensure that a product meets more than its functional objectives. As my colleague Tom Stein says: "These days it's not enough to know that your product works. You have to know where it fails so that you can fix it before your customer finds it."

Probably the most well-known aspect of product integrity (PI) is regulatory compliance. Regulatory compliance means that your product meets the requirements set out in domestic and international laws. These laws commonly apply to product safety, electro-magnetic compatibility (EMC), immunity, and perhaps network protection and performance in the case of devices connecting to public telephone networks.

Often overlooked aspects of PI are climatic, thermal and mechanical testing, often referred to as shake and bake. Another area of interest is the calculation of mean time between failures (MTBF). A

product should be subjected to all conditions that it might endure under less than ideal conditions throughout its life cycle, including those that could occur during foreseeable misuse.

Many manufacturers often overlook or underrate environmental testing. Most feel confident that their equipment is environmentally robust after only a simple burn-in cycle. Burn-in is the process of operating the equipment at the maximum specified operating temperature for a period of time (usually a few days). Burn-in usually weeds out units that would have failed quickly in the field. This is called infant mortality. A burn-in cycle doesn't test for potential exposure to low temperatures, extreme temperature variations and varying degrees of humidity. In the scope

"These days it's not enough to know that your product works. You have to know where it fails so you can fix it before your customer finds it."

of the global marketplace, climatic extremes should be expected.

Mechanical testing is sometimes seen as a luxury and is often limited to a packaged drop test. A simple drop test might entail

dropping a packaged unit from waist height to simulate rough handling during transportation. But consider what stresses a unit would really go through on the way to market: bounced, jostled and shaken in the back of a truck, then dropped by a busy courier on the sidewalk in a rush to deliver to the customer. These are crucial stresses to accommodate for in a design; a few products damaged in transit could tarnish a company's reputation. There are also more subtle forms of damage, such as weakened

solder joints that may result in latent product failures (those that occur sometime after the unit is in service).

Another exercise that is seldom practised and rarely understood, is the calculation of system reliability or MTBF. Some of the benefits of having calculated MTBF include being able to plan a maintenance or replacement cycle, being aware of the useful life of the product. This may be slightly less important for a home computer, but could be essential for a data switch at an international bank. Awareness of MTBF and useful life can also be helpful in warranty provisioning, (planning for a certain number of defective units to be returned.)

Some of the larger manufacturers have their own test facilities, but for those who don't, there are many well-equipped laboratories in Canada that can perform these tests. The Standards Council of Canada lists accredited laboratories on its Internet Web site at <http://www.scc.ca/certific/labs.html>, or you can call the council in Ottawa at 613-238-3222.

It makes good business sense to implement a product integrity cycle in your design phase. It could save you money by decreasing customer returns and service calls as well as being a factor in building your company's reputation as a consistent producer of quality product. ■

Hugh Long is project co-ordinator at Nortel in Ottawa. He can be contacted at 613-763-8208 or at hlong@nortel.ca. Nortel works with customers worldwide to design, build and integrate digital networks for information, entertainment, education and business.