Michael T. Brandt

What Does ESD Really Cost?

A Q&A session regarding the impacts of ESD damage.

In most conversations about electrostatic discharge (ESD), somebody inevitably asks, "What does ESD cost us?" and "Is it cost effective to control ESD?" I asked Steve Halperin, president of the ESD Association, to provide us with some answers to these questions.

Q: *Steve, what does ESD damage cost a company and the electronics industry?*

Steve Halperin: Independent consultants and corporate studies have found that ESD losses can be as high as 10% of annual revenues with an estimated average negative impact of 6.5% of revenues. Based on 1997-2001 production data, the international electronics industry is losing in excess of $84 billion every year. Other than increasing sales, ESD control is the single most profitable opportunity for our industry in today's economic conditions.

Q: *That seems like a lot, especially since many ESD-sensitive items are low cost?*

Halperin: Managers often view ESD impact only as a direct material cost. The fact is that material loss often represents the smallest cost of ESD impact. If you add up the costs of rework, burden and overhead, warranty and field service and customer service and satisfaction, even a small device loss may become quite significant.

ESD materials losses are *budgeted*. Since management does not pay to rework low-cost, defective assemblies, material losses and additional inventory are included in the cost of our operational budget. Often, we ignore the causes of defects in the heat of production demands when we get profitable returns, only to repeat the loss in the future.

Q: *How do factors such as additional material costs fit into the cost equation?*

Halperin: ESD impact on one low-cost device that is part of an assembly creates an exceptionally high cost. We invest in a comprehensive rework program and face the challenge of salvaging expended materials, labor, burden and overhead costs when the product does not function properly due to ESD. Since we did not do it right the first time, we will pay to do it again.

When rework, field service or contracted services are required, the costs are ultimately absorbed in burden-related expenses. Burden and overhead are necessary evils that affect the operational bottom line. They are applied to initial production, as well as rework facilities, labor and payroll costs, remote plants and service organizations that make our products work when defects are evident.

Q: *What about warranty costs?*

Halperin: Warranty support when the product fails in the customer's environment during the warranty period is the highest expense a company can incur. In ESD terms, *latent damage* occurs when a device is partially degraded during manufacturing and handling, yet it meets product test specifications and is ultimately shipped to a customer. In effect, a device with latent damage has a shortened operational life.

When the product or system is too expensive to replace, field service is provided. Not only does the customer experience lost productivity due to product failure, but the manufacturer also incurs high costs to repair the defective product.

Q: *Isn't it all about keeping the customer satisfied?*

Halperin: Customer satisfaction may be the single greatest cost of all, since huge portions of corporate revenues are spent in marketing, sales and sales support to make the customer happy. Many managers feel that replacing key customers is the most expensive process a company must face.

Q: *Can you transfer these cost savings to the bottom line and return on investment (ROI)?*

Halperin: While the cost of an ESD event will vary depending on product criticality, configuration and system sensitivity, a large portion—possibly as much as 80%—of the costs related to ESD impact can be recovered and transferred to the bottom line as profit, with a dramatic impact on the company's financial situation. A properly implemented ESD program can have an ROI exceeding five to one within six months.

ESD control yields enhanced quality and productivity with low costs, great customer satisfaction and high profitability. Such control allows the organization to meet shifting market trends and effectively handle ESD-sensitive devices in their technical evolution.

The bottom line: Today's organization must be ESD-proficient to survive and grow under profitable and productive conditions. ■

Michael T. Brandt *is a publicity consultant to the ESD Association and president of Marketing Resources Ltd., Rockford, IL; e-mail: mtb@mrlweb.com. This column is a regular contribution of the ESD Association, Rome, NY; (315) 339-6937; e-mail: eosesd@aol.com.*