ESD Basics

The ESD Association

What Does ESD Really Cost?

Would you believe 4 to 8% of revenues are wasted each year?

In most serious conversations about ESD, the discussion inevitably turns to cost. What does ESD really cost us? Is it cost-effective to control ESD?

According to Stephen Halperin, a consultant specializing in electrostatic problem analysis, and Prostat Corp., independent consultants and internal corporate studies have found that ESD losses can range from 4 to 8% of total annual revenues. It is estimated that the global electronics industry is losing in excess of $84 billion every year based on production data from 1997 through 2001.[1] Other than a dramatic increase in sales, ESD control is the single most profitable opportunity for industry under today's economic conditions.[2]

While in the short term, ESD-sensitive items may seem to be low-cost losses, actual material loss is the smallest cost of ESD damage. According to Halperin, if you add up all the costs, such as rework, burden and overhead, warranty and field service, and customer service and satisfaction, even a small device loss can become quite significant. ESD impact of one low-cost device that is part of an assembly or system creates an exceptionally high cost.

Costs for additional rework, field service or contracted services include 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, states Halperin.

ESD losses are budgeted. Material losses and additional inventory are included in the cost of the operational budget. In the heat of production, when increasing sales provide profitable returns, the causes of these defects are often ignored – leading to repeated losses in the future.

Halperin adds that warranty support is the highest expense a company can incur for every affected unit. In these situations, customers become the victim of what is called latent damage. This describes a device that is partially degraded during manufacturing and handling yet meets product test specifications and is ultimately shipped to a customer. In effect, a device with latent damage has a shortened operational life.

According to Halperin, the cost to rework a failure found in the manufacturing process is much lower than the cost associated with a failure in the customer's environment or application. In situations where the product or system is too expensive to replace, field service is provided. Not only does the customer experience lost productivity or revenues due to product failure, but the manufacturer also incurs high costs to repair or otherwise correct the defective product.

In a system where keeping the customer satisfied is arguably the most important goal, intangibles like customer satisfaction can become very expensive. It is not unusual to expend huge portions of corporate revenues in marketing, sales and sales support to make the customer happy after a disappointing experience, states Halperin. If the customer fails to be appeased, the manufacturer then faces the extraordinary cost of replacing the customer. According to Halperin, many managers feel that replacing key customers is one of the most expensive endeavors a company may face.

The cost of an ESD event will vary depending on product criticality, configuration and device or system sensitivity. Under reasonable conditions 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. This could dramatically impact a company's financial situation.

A properly implemented ESD program can have a return-on-investment exceeding 5:1 within six months. This assumes trained ESD personnel, positive management support, a well thought-out plan to meet process conditions and appropriate materials and equipment.

ESD control enhances quality and productivity with lower costs, greater customer satisfaction and higher profitability. Another benefit, adds Halperin, is that an organization with a thorough ESD control plan in place can meet shifting market trends and effectively adopt and handle ESD-sensitive devices and assemblies as they evolve.

According to Halperin, the bottom line is that today's organization must be ESD-proficient in order to grow under profitable and productive conditions. ■

This column is a regular contribution of the ESD Association, Rome, NY; (315) 339-6937; info@esda.org.

References

1. Stephen A. Halperin, "ESD Control: Profitable Opportunity in Tight Economic Times," *Threshold*, January/February 2003.
2. Ibid.