THE CHALLENGES OF MANAGING TEST

Atul Goel
Agilent Technologies, Inc.
Loveland, Colorado

The role of test continues to be a nexus between design and manufacturing on one hand and the various, increasingly fragmented portions of the semiconductor supply chain on the other. In addition to managing the internals of the test unit operations, the test manager often finds herself or himself being an interface manager at these critical junctures. Several of the challenges and also opportunities of managing Test Manufacturing arise from this circumstance.

In addition, over the last several years, partly encouraged by the predictions forecast in the 1997 ITRS roadmap and also as a result of the increased fragmentation of semiconductor supply chain, there has been a much greater focus on measuring and managing the costs of test.

Many of the biggest initiatives in test manufacturing at Agilent have been in response to these dual pressures of interface management of a fragmented supply chain and value chain, and the efforts to control part test costs.

We have addressed the test to design interface management problems by sponsoring active links between Manufacturing Test Engineering and the IC designers and their design process. We have sought to become involved in the design process as early as the design investigation phase, thereby helping influence DFT approaches (which incidentally also help with test cost) and thus have gained early visibility to the test technology needs for a given design well before artwork release. Design engineers in turn have also had access to a set of web-based manufacturing release process tools to facilitate their manufacturing release cycle to Test and help reduce their Time to Market.

A fundamental breakthrough on Agilent’s Manufacturing Test floors has been the worldwide adoption of a single standardized test platform. This has taken some careful planning and investment. In addition to choosing a single scaleable platform worldwide, we have made several operating system, material handler selection, tooling and process management standardization decisions spanning all of our test operations worldwide to make this vision a reality. The return in terms of effective capacity management, improved equipment utilization levels, reduced spare parts inventory levels, operator, technician and engineer training and staffing ratios, and the acceleration of the manufacturing release cycle, has been excellent. Benchmarking data has shown this managed single standardized platform approach to have a very significant effect upon unit test costs and even Time to Market for Agilent’s IC parts.

Agilent Manufacturing Test has established a facile set of links and a universal database to provide timely yield and WIP visibility to the silicon fabs, supply chain controllers, designers and other members of the semiconductor design and manufacturing ‘molecule’. This has significantly impacted the responsiveness and cycle time of various design and manufacturing processes. These communication tools have also facilitated Test’s interface management challenges. These tools have provided the basis for measuring the results of our platform standardization efforts, especially those related to test costs.

People continue be our key sustainable competitive advantage. Recruiting, training and retaining the best talent to meet Test Manufacturing’s difficult challenges has been a fundamental driver for our management team. We have met this need by visibly identifying Test’s challenges and establishing a responsive roadmap. The respect and visibility gained by proactively forging active and supportive links with Test’s internal customers has created an attractive and dynamic culture for our people.