

Tomorrow's Technology, Today's Demand

How to Integrate R&D Wafers into Production Fabrication

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Research and development is the only way to move your business forward, but it isn't easy to manage. Anyone who has tried to integrate R&D wafers into a production fabrication facility knows how tricky it can be.

Departments may argue. Resources may not be available when they're needed. Work-in-process could flood the production line. If you experienced any of these scenarios — or numerous other potential problems — you are not alone.

Your goal is to introduce new processes and products as quickly as possible, while you continue to serve existing customers well. But how?

Tefen consultants have observed many approaches, and they've come up with solutions and recommendations that can help you integrate R&D into production with a minimal of frustrations and complications.

Sharing Management of the Fab

Many companies attempt to integrate R&D with production by having the two departments share management of the fab. This approach works poorly for a variety of reasons. Both staff efficiency and equipment utilization tend to be low because of frequent changeovers and the extra cleaning and tests required. Managers must wait a long time for test results, and scheduling can be extremely difficult.

Such problems make sharing management of the fab a costly strategy. This arrangement also reduces the incentive for the R&D department to carefully plan and monitor its budget for the project. Plus, expensive R&D resources are used to run production — a waste of unique resources.

Another drawback of sharing management responsibility is that the production and R&D departments use two different indicators of performance. Production is measured by fab performance, while research and development looks for the

development results. Success becomes difficult to measure as priorities conflict.

Shared management can also cause conflict among staff. Communication issues come up frequently as workers adjust to a temporary shift in roles and responsibilities. Managers may argue over whose priorities come first, and executives may not hold them accountable for running the fab efficiently and effectively.

Because time-to-market is so important in the changing semiconductor industry, fast cycle time is key to successful research and development. The shared management approach's poor cycle time performance can affect the time it takes to get new products and services to the customer. For all these reasons, this approach is not recommended.

R&D in Charge

When the R&D department runs the fab, objectives are clear and conflicts do not normally arise between R&D and production staff members. Managers and workers are accountable for their work, and everyone involved in the project knows who is responsible for the fab. Another advantage of this approach is that the R&D department has some incentive for controlling its budget. However, having the R&D managers run the fab tends to be too expensive and inefficient.

When the R&D Department is responsible for the Fab, equipment and staff utilization tend to be low. The research and development department ends up using its resources for production purposes, costing the company unnecessary dollars. This strategy is both costly and slow, but it does have some advantages.

A Better Solution

The recommended third approach is: letting production run the fab while serving the R&D department as a preferred client with special needs. In this instance, the Fab should use state of the art tools to

manage productivity. Tools such as WIP scheduling, BN management, accurate models, clear work procedures and developing meaningful performance indicators are all extremely important. This strategy offers a number of advantages.

First, performance tends to be high, as the fab is run by manufacturing experts who are trained to make production flow as smoothly and efficiently as possible. The resulting short cycle time improves time-to-market for new products.

Objectives and responsibilities are clear, making it easier for both departments to measure performance and reducing conflict and miscommunication among staff.

When the production department serves the R&D department as a client, companies are better able to control costs. Expensive R&D resources are used only for research and development purposes, and are not under utilized on everyday production. The research and development team must carefully plan its project — including the budget — in order to get optimal service from the production department. Because resources are used efficiently, the cost per wafer tends to be relatively low. This structure allows you to deliver new products to your customers as soon as possible, so your business continues to grow and prosper. ■

