

## Can Your Contractor Really Support Your Product's Full Lifecycle?

*By Curtis Campbell*

Most original electronics manufacturer (OEM) sourcing teams need varying levels of support over each product's lifecycle. At SigmaTron International we see these support requirements involving both engineering and business elements, and have adapted our business model to support both sides of this equation. This paper focuses on some of the critical elements that should be evaluated in both areas.

On the technical side, requirements can include:

- Ability to provide a "real world" engineering perspective during product design that addresses component availability, manufacturability, testability and quality considerations
- Ability to support any regulatory requirements related to product or production qualification, plus ongoing requirements for component or process change approvals dictated by the product's regulatory environment
- Ability to team with each customer on quality initiatives and cost reduction activities over the life of the product
- Ability to address obsolescence issues over time, either through redesign or approved procurement practices
- Ability to support troubleshooting and testing associated with repair depot operations, if product cost and lifecycle length makes repair depot a viable support service.

From the business side, the equation can be far more complex:

- Ability to provide cost effective solutions for varying demand levels over the life of the product, that maximize responsiveness while minimizing inventory pipeline as much as possible
- Ability to provide continuous visibility into product status and quality trends
- Ability to offer a choice in manufacturing locations to support issues such as proximity to product development team, proximity to end markets or access to lower cost labor markets.

### **Real-World Engineering Perspective**

In the EMS industry, product development support can run from use of automated design for manufacturability/testability (DFM/DFT) software analysis tools to actual engineering support. The benefit of using the engineering resources of an EMS company, when available, is that those engineers typically look at likely commercialization challenges as well as actual design challenges. Quality track

record of selected components, packaging recommendations related to intended use, DFM/DFT recommendations and potential obsolescence issues are all part of the analysis.

In SigmaTron's model the level of product development support provided aligns with the needs of the customer and can vary from detailed product development engineering support to simply DFM/DFT analysis. The Company's Spitfire Controls division offers a joint development model for companies needing product development support aligned with Spitfire's design competencies. Application-specific design firm strategic alliances are in place for products which require more specialized support. DFM/DFT analysis can be offered as part of the Company's New Product Introduction (NPI) process. The goal is to use a flexible set of resources to fill any gaps the customer has in its product development support team.

### **Regulatory Compliance**

Highly regulated industries such as medical and aerospace have very specific requirements over a product lifecycle related to documentation, design and production qualification, product approvals, material integrity and degree to which the product or its production processes can be modified. There are also very specific traceability and device history record keeping requirements. In the case of aerospace and defense projects, there may be very strict regulations on who may have access to product documentation or certain parts of the production process, plus restrictions on locations in which certain parts of the product can be manufactured. Across all industries there are a growing number of regulations related to issues such as hazardous material content and Conflict Mineral content. Cost effective compliance generally involves the use of automated systems and strong knowledge of industry-specific requirements.

SigmaTron addresses this in several ways. First, its North American facilities are ISO 13485-registered to support the medical market. Its U.S. facilities are ITAR-registered to better support aerospace and defense customers' documentation security requirements. Its Silicon Valley facility is also AS9100C-registered and has specialized coating and cleaning processes to better fit the requirements of mission critical products.

All facilities utilize bar-coding to track materials and product through production as well as to support traceability and device history recordkeeping requirements. Unless directed by a customer, SigmaTron does not buy from non-franchised distributors to minimize the risk of counterfeit components or substandard components. If production testing indicates components are failing, the failed components are immediately investigated. In the event a customer authorizes use of non-franchised distributors, SigmaTron can arrange for added testing/validation through component manufacturers.

The Company operates a Green Initiative Compliance Service Center to further ensure material integrity and regulatory compliance. The center is located in the Company's Suzhou, PRC facility and interfaces

closely with component engineers and procurement professionals in the Taiwan International Purchasing Office (IPO) to gather necessary material documentation from suppliers related to regulatory, social and environmental initiatives such as RoHS, RoHS II, REACH, Conflict Minerals and California's Proposition 65, as well as customer specific initiatives. Specialized software supports the operation by providing updates as monitored jurisdictions create new rules or modify existing rules. The tool can also be programmed to support customers who have specific lists of substances and materials that they want to track.

### **Teaming on Quality and Cost Reduction Initiatives**

Quality philosophies such as Lean manufacturing and disciplines such as 5S and Six Sigma help improve overall efficiency while eliminating the opportunities for defects to arise. In auditing potential contractors, look for evidence of a proactive approach to eliminating defect opportunities and identifying areas of potential cost reduction.

SigmaTron utilizes Lean manufacturing philosophy and Six Sigma tools in its production processes. It has also developed internal systems which provide real-time quality data collection and process feedback. Custom reports can be created to support customer-specific data requests or specific improvement initiatives.

### **Obsolescence Management**

Long lifecycle products can have significant support challenges, particularly when they are in highly regulated industries such as medical. Look for contractors with demonstrated ability to monitor obsolescence risk offering a range of options for mitigating that risk.

SigmaTron can perform product lifecycle analysis (PLM) as part of its NPI process. Additionally, it has an experienced materials team that works closely with suppliers to identify potential availability and obsolescence issues as early as possible and recommend the most appropriate solution. The Company can also provide product redesign recommendations.

### **Post-Manufacturing Support**

Longer lifecycle products often require post-manufacturing support. Teaming with a contractor to provide that support at the production site can minimize the need for duplicate test equipment, and raw or finished goods inventory requirements.

SigmaTron provides customized fulfillment and repair depot services to customers requiring post-manufacturing support.

### **Managing Variable Demand**

Demand can vary quite significantly over the life of a product. Contractors focused primarily on high volume production often find lower volumes or highly variable demand challenging to support. Look for supply chain management systems optimized to support varying volume levels and a willingness to carry finished goods kanban.

SigmaTron combines Exact Macola ES ERP software with its internally-developed iScore suite of supply chain management tools to optimize its ability to support demand variability. An MRP Share program provides suppliers with complete customer forecast visibility, plus current inventory and material on order. The iScore system supports vendor-managed inventory (VMI) and Production Driven Replenishment (PDR™) pull signals. Customers are given visibility into inventory status via the Score™ customer portal.

VMI is used, as needed, with component suppliers. It can also be used with customers wishing to consume transferred inventories before new material is phased in. PDR™ is triggered automatically when the iScore system checks inventory for shortages as shop orders are released. If a shortage is detected, a PDR™ pull signal is sent to the supplier and parts are received in 2-7 days. An Automatic Replenishment System (ARS) is used for higher volume “C” items. The ARS brings these items in at regular intervals.

Finished goods kanbans can be set up to support less frequent production requirements or products with highly variable demand.

### **Production Location Options**

Sourcing needs can change over time. Your product development team may prefer to work near your leading edge products. Migrating a project to a lower cost labor region may be the best way to cut costs without doing a redesign. However, if a new contractor is required every time production is moved, there may be significant transfer costs, both in terms of internal staff time and non-recurring engineering and tooling at the contractor. Disengagement from the prior contractor may trigger inventory reconciliation or other termination-related costs. Alternately, utilizing a contractor with the ability to transfer projects among facilities as project needs change provides flexibility at significantly lower non-recurring transfer cost.

Each of SigmaTron’s facilities offers traditional contract manufacturing services plus unique advantages tailored to the region. The China facility is licensed for import into China, as well as for export to other markets. The Vietnam facility adds a lower labor cost option in Southeast Asia. Three Mexican manufacturing facilities provide logistically simple, highly cost competitive North American sourcing options for margin sensitive product. The Silicon Valley facility is designed to support the complex technology needs of the region, both in terms of short-run and volume production. SigmaTron’s

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Midwest facility supports companies wishing to nearshore some of their production within the region, plus offers automated solutions for legacy products.

### **Conclusion**

Sourcing needs change over time. Selecting a contractor with a business model that is flexible enough to adapt to those changing needs typically represents the most cost effective option. In auditing potential suppliers, look for examples of projects in varying lifecycle stages and ask questions about how those needs are supported. In checking references, ask about the product mix supported and whether or not the contractor is better at some phases of product lifecycle than others. During site evaluations, meet the production team and program management staff. Does there appear to be good understanding of your project's requirements? Can the team discuss viable solutions to your needs and give examples of similar situations they've effectively supported?

Selecting a supplier with a full range of support capabilities and a team eager to solve project challenges reduces total cost and enhances your company's ability to provide superior quality product in line with the evolving needs of its end markets.

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