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Service Is Key to Reshoring Success

By Alexandra Topp, Sales and Marketing, Spectrum Assembly, Inc., Carlsbad, CA

For companies involved in providing electronic manufacturing services (EMS), the trend towards returning manufacturing to the United States, known as "reshoring," would appear to be gaining momentum. There are a number of reasons for this, including the strength of "Made in the USA" branding, time constraints for new product introductions, product teams that want to be closer to the production site, variable demand requirements that make it difficult to work with offshore manufacturers, regulatory issues that limit supplier choices, and concerns with quality.

In reviewing these reasons one at a time, the "Made in the USA" branding, for example, has been gaining strength with consumers as unemployment levels in the USA have increased and the quality of foreign-made products has decreased. Having a "Made in the USA" label now provides a true competitive advantage compared to foreign-made products.

Spectrum Assembly, Inc. (SAI) supports several customers who have made a commitment to keep some or all of their production in the United States.

The time available for new product developments is shrinking, both as a result of technology evolution and because of a growing number of competitive products. To save time, many product development teams prefer to work with a local source for building prototypes through medium volume production. SAI applies vertically integrated systems to produce printed-circuit-board assemblies, cables, harnesses, and complete assemblies under one roof, offering a single source for critical components to further reduce product development times.

SMT lines also include component towers which select components based on system requests and provide humidity-controlled storage for moisture-sensitive parts.

Rising Costs in China

Concurrent with resourcing, labor costs have risen in China, forcing OEMs to take a closer look at their total sourcing costs. Travel costs and time spent in getting to different time zones can cancel any savings due to lower labor costs for low-to-medium-volume projects. Also, companies that have kept a portion of their production in the US often find that a local supplier is the most efficient source for the PCBAs or subassemblies or for final production, since changes in schedules or engineering change orders (ECOs) can often be more quickly communicated and fulfilled when a customer and supplier are in closer proximity. The amount of time that sourcing, engineering, and contractor teams need to spend together is usually dictated by the levels of product maturity and project complexity for a given job. The closer proximity of a supplier can also be a benefit for situations where demand is difficult to predict, which is generally true in the current economy. Having a local supplier translates into greater schedule flexibility since shipping lead-time drops out of the equation.

For products in highly regulated industries, supply base options can be very limited for certain components. For example, one of SAI's customers whose products are used in the nuclear industry can only use raw cable that meets very rigid

industry specifications. The only two suppliers for that type of raw cable are located in the USA. Offshore sourcing involved shipping this raw cable to a contract manufacturer in China, having the product assembled in that facility, and shipping it back to the USA. For the cost of air freight needed to support demand variations for a built-to-order variation of the product, building the product in the USA was clearly the most cost-effective option.

Quality Concerns

Most OEMs perform audits to ensure that an offshore contractor provides acceptable levels of quality. Unfortunately, offshore contractors in lower labor cost production regions may substitute some of their workers for different projects when it can mean reducing labor costs. If not effectively monitored, this practice can create significant quality issues for companies in regulated industries, such as in medical, defense, security, and avionics, all of which are market areas supported by SAI. Onshore manufacturers concerned with maintaining high quality, such as SAI, invest in low-turnover workforces and in using fewer employees to perform a wider variety of tasks. As an example, over 50 percent of the production operators at SAI have been with the company for over a decade.

Line side automated optical inspection (AOI) equipment is used to actively monitor first pass yield production quality and the line is shut down if more than three defects are found.

These six reasons may be good reasons to reshore, but reshoring only makes sense when a chosen supplier is focused on fast speed, high quality, and excellent service. Contract manufacturers once followed the guidelines of "doing it better, faster, and cheaper" than a customer could himself. But SAI has built a company based on "doing it better and faster" while achieving a lower cost of ownership than an offshore facility. To support that goal, SAI has fostered a lean culture focused on high quality, excellent service, and flexibility combined with smart systems and efficient processes.

Supporting Small Lot Sizes

SAI's manufacturing strategy is guided by four basic principles: configuring equipment to support small lot sizes, minimizing variations, minimizing waste due to poor quality or inefficient operations, and minimize transport time. The company addressed several of these principles by migrating to a paperless factory system in 2012 using Aegis Manufacturing Operations System (MOS) software. Using the software reduces the time needed for New Product Introduction (NPI) by electronically transferring documentation used to generate production documentation and program production machines. This seamless approach also reduces the personnel needed to support NPI and provides a centralized repository for documentation control while eliminating the potential for errors that arise in more manual methods. Work instructions are displayed electronically on the production floor, speeding the changeover to new jobs and eliminating the potential for mix-ups that can occur with paper documentation. The use of the software and computer system also automates the collection of data related to quality control.

In terms of equipment, SAI has focused on solutions from MyData (www.mydata.com) that are easy to program and can be changed over quickly. For example, MyData's model MY500 inkjet printer used as a solder paste printer eliminates the need for a stencil and offers greater control of solder paste deposition. Placement machines don't require leaders on tape and reels, minimizing component attrition in setup. The SMT lines employ MyData component towers to select components based on system requests while providing humidity-controlled storage for moisture-sensitive parts. Line side automated optical inspection equipment actively monitors first-pass yield production quality; the line is shut down if more than three defects are found.

Under One Roof

SAI's business strategy also focuses on minimizing variations and inefficiency. PCBA, cable and harness assembly, and box build operations are located under one roof. This level of vertical integration cuts time and cost by simplifying the supply chain.

In terms of service, SAI offers specialized service packages so that a customer can easily choose the right mix of support for their needs. For example, SAI's Active Scheduling service package is designed to meet the needs of companies with a large mix of products and/or variable demand schedule changes. As part of that package, an SAI program manager will team with a customer to develop a forecasting framework, set material bonds, and determine required finished goods per a Kanban process. The results of SAI's focus on service speak for themselves: near-perfect on-time delivery, 99.8 percent first-pass yield on harness and cable assemblies, and higher than 95 percent first-pass yield on PCBAs. By combining service and quality with extensive production capabilities, SAI hopes to make reshoring a realistic option for interested manufacturers.

Contact: Spectrum Assembly, Inc., 6300 Yarrow Drive, Suite 100, Carlsbad, CA 92011 ☎ 760-930-4000
fax: 760-930-4008 E-mail: Alexandra@saicorp.com
Web: www.saicorp.com ❒