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Use of Third Party Inspection

Third-party solution providers can help within emerging markets.

It's hard not to pick up a newspaper or industry magazine or surf the internet without reading that manufacturing industries are relocating their operations to other countries. During the past couple of years, it's been equally difficult to avoid articles concerning serious quality issues present in consumer and industrial products produced in emerging economies. Even as product lines move to China, India, and Russia, domestic companies are losing significant numbers of experienced employees throughout their organizations due to early retirement or reassignment. Diminished and often lost in this regard is the tribal knowledge of operators who know the pulse of the manufacturing process. This triple whammy of outsourcing, loss of tribal knowledge, and decrease in product quality has emphasized the need for third-party suppliers of supply chain solutions.

Even without the prospect of moving a product line, buyers continue to look offshore for lower-cost suppliers, both for export back to the home market as well as to serve the needs of the growing, emerging markets. However, the launch and start-up of essentially new and unfamiliar product lines in these foreign lands may produce quality levels below expectation. Significant transit time across the ocean eats away any buffer in the production timeline, so cost savings can easily be lost when expedited shipments are required. Quality Management Systems (QMS) don't mitigate the problem. QMS standards such as ISO 9001 and ISO/TS 16949 for the automotive industry still require product validation and some level of supplier development, regardless of the country of origin of the purchased products.

To address these complexities, it is crucial to have resources on the ground in the developing market. When suppliers are located halfway around the world in a culture that is unlike our own, quality professionals need to be creative in the way that they develop and support the supply base. Manpower reductions and other cost- reduction strategies, as well as increasing travel costs, have organizations leaning toward outsourcing some or all of their supplier-development activities to independent third parties familiar with quality management systems, tools, and techniques.

Why a third party?

Using a third party for quality-based activities is not necessarily a new concept, particularly in the automotive industry and ship-building industry. General Motors, for instance, has utilized approved independent third-party providers for inspection and containment activities at their tiered suppliers. The process, called "controlled shipping," is a supplier-funded inspection activity that is performed and administered by an approved third party. The purpose is to provide a filter at the supplier's location to detect and prevent nonconforming product from reaching the assembly lines. This has been in place for more than a decade. In the ship-building industry, this practice has been used for quite a long time because components that go into building of ocean-going ships are sourced from any part of the world. Matter of fact, most of the well-known third party inspection agencies in the world have had their origins from this industry. These agencies are, generally, part of major ship classification societies of the world, for example, Lloyd's Register of Shipping, Det Norske Veritas, Bureau Veritas, Chinese Register of Shipping, Indian Register of Shipping etc.

Another example where outsourcing quality services provide value occurs when the suppliers utilize a third party to inspect for defective parts when it may not have the resources to manage and administer the inspection team internally. Not only do professional third-party providers offer inspection services, they also help the supplier solve and prevent future non-conformances from occurring by using root cause analysis, developing an effective corrective action plan, and utilizing other quality engineering techniques.

There are some obvious cost benefits to outsourcing quality functions. For instance, in the case of a company with a Chinese supplier, a third-party quality-service provider with representatives in China would eliminate the extraordinary travel expense of sending a company representative from the United States. A qualified quality engineer could be deployed to the supplier location from a Chinese office, thereby avoiding the regulatory requirements of work visas or permits, and the lengthy processing of paperwork. Similarly, in case of company with an Indian supplier, an Indian third-party quality service provider in India would serve the same purpose.

Using a Chinese or Indian national as a third-party quality auditor eliminates the issues of language and cultural differences. In addition, a local engineer can deal effectively with top management and others throughout the organization. Conveniences such as transportation or additional vehicles, cellular phones, the internet, and other telecommunication essentials already exist within the partner's infrastructure and don't have to be reinvented.

Two case studies

Companies looking to purchase products at a reduced cost or to serve growing developing-economy markets are looking at all opportunities, including partnering with overseas manufacturers, to achieve their objectives. One such company, located in the Midwest, recently partnered with a supplier in China that was relatively new to Western quality management system requirements. This supplier provides power transmissions, bearings, and specialty components to a variety of industries, including aerospace.

The supplier manufactures housings that are cast and then machined to print specifications. The supplier shipped some of these parts to its U.S. customer for a trial run in its production systems. Upon receiving the parts in the United States and assembling sample runs, the company realized that the parts did not meet all of the print specifications. Although the fit, form, and function of the assembly were not compromised, additional rework was required to bring the parts into specification.

Recognizing that accepting rework activity on a purchased product is cost-prohibitive and philosophically unacceptable, the customer contracted with a third-party provider of inspection and containment services to the manufacturing industries.

The consulting engineers immediately recognized that a detailed product and process validation would be required at the supplier's location. Even though these particular components were not going to be utilized in an automotive-based application, it was decided to apply the advanced product quality planning and control plan (APQP) to this supplier and the resultant production part approval process (PPAP) to these parts. The consultants, Preferred Sourcing LLC, headquartered in Greenfield, Indiana, had already established a presence in China through a partnership with Indianapolis-based International Leverage LLC, a U.S./Chinese venture focused on helping U.S. firms buy from, sell to, and partner with firms in China. Therefore, the initiation of quality engineering services in the supplier's facility was only a matter of procuring a purchase order and defining the scope of work.

The partners coordinated the deployment of an experienced Chinese quality engineer with an extensive automotive background, including knowledge of APQP, PPAP, and geometric dimensioning and tolerancing (GD&T), to the supplier's manufacturing plant. With the work instructions and statement of work in hand, the engineer addressed and conducted a full supplier assessment.

Using the criteria specified in the customer's work instructions, the engineer began a review of the documentation that would make up the PPAP records. He followed a standardized checklist and a consistent process for each part that the Chinese supplier was providing to its U.S. customer. As the submissions were

individually reviewed, the engineer noted deficiencies and communicated these to the customer. Once the deficiencies were identified, the engineer worked with the supplier to develop corrective actions to correct the causes of the nonconformities.

Beyond the PPAP desk audit, the engineer performed actual dimensional reviews and validations along with measurement systems analysis of the gauges used to determine product quality. These action items were mostly covered in the production lot approval work instructions from the customer. As in the PPAP, the engineer documented and communicated the deficiencies and nonconformities.

As a result of the part reviews, International Leverage's China team and Preferred Sourcing's engineers determined that there were gauging dissimilarities between the supplier and the customer. The supplier changed gauging methods, and the engineer facilitated a measurement system analysis to validate the inspection methodology.

Now that the supplier had valid data, it was able to conduct statistical studies on the production runs, making necessary adjustments to bring them back into print tolerances. Additional studies were then conducted to validate the process changes and the company's ability to maintain a normal distribution and capability.

The engineer was able to close the project within a reasonable amount of time and educate the supplier as to the expectations of the customer as well as some of the available tools used in quality manufacturing.

This type of scrutiny and interaction would have been almost impossible or cost-prohibitive without a third-party partner.

Another example of the benefits of outsourcing supply chain management can be seen in the case of a supplier providing machined castings for an axle application. A third-party quality-service provider was brought in to address issues relating to nonconforming products being delivered to a U.S. client supplying finished systems within Indian domestic market.

A Pune-based quality engineer, Sanjeev Paranjpe, with more than 30 years of automotive experience with original equipment manufacturers and tier-one suppliers in India, was brought in to perform an overall supplier assessment. This technique is often used when first approaching an assignment in China or India because it can uncover a number of issues within the supplier's organization and manufacturing systems that affect the supplier's ability to perform and meet the customer requirements. In developing markets, the issues tend to be related to the specific parts in question, as well as to the entire management system.

Through this initial audit, Sanjeev discovered that the client's product was not even considered a "real program" and was not being tracked in the supplier's management reviews. This deficiency was quickly addressed with senior management, and management at all levels of the supplier's organization became involved in the process.

Sanjeev further found that although data were being taken utilizing some relatively sophisticated measurement equipment, the output was only used as a go/no-go gauge for one specific part. Data weren't being collected and analyzed to understand true process capability. In fact, Sanjeev found that there was really no complete quality system in place.

Another step to improving the process was to implement visual controls and performance-tracking charts throughout the facility.

Often the audits lead the quality engineer to explore issues at tier-two or tier-three suppliers as well. In this case, Sanjeev found that the raw-castings supplier was not keeping production segregated by lot, so when the machining operator set up his station, he could not keep proper control of his process due to the lot-to-lot variation of the casting hardness. Once this was corrected, significant improvements were made.

In developing markets, it is important to look at the manufacturing and management systems as a whole, in addition to reviewing and analyzing the particular parts in question. Being able to communicate well throughout all levels of the organization is also critical for success.

Throughout a period of three months, Sanjeev and his team developed and implemented a total quality system with this supplier, significantly improving the quality of parts being delivered to their client. None of this progress would be possible without an experienced and well-trained team on the ground. It's important to be credible in the eyes of the client's suppliers so that change can be made in a timely manner.

Customer perception

Whether the role is as a technical representative or quality engineer, the third-party quality service provider becomes the eyes and ears of the customer. Because that role can be an on-demand service, the structural costs of maintaining a full-time associate are eliminated. The customer pays only for the services rendered when they are required, without having to develop an infrastructure of its own. Aside from that, there are no costs for health care, pensions, or other structural expenses to accrue, as when using internal manpower to reach the same results.

The cost savings achieved from the use of a third party are easy to realize, but there is also the important benefit of using these observations and expertise to leverage additional cost savings in the form of continuous improvement activities such as applying Six Sigma or *poka-yoke* tools. These savings, derived from prevention, detection, or both, can be translated into lower manufacturing costs and eventually the reduction of the purchase price.

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