ADVANTAGES TO SYSTEMATIC QUALITY EVALUATION IN A NEW PRODUCT LAUNCH

Quality deviation potential in new and existing part designs
In quality discussions among OEM manufacturers and their suppliers (Tier I, Tier II) it's common to reference small numbers. Single digit percentages or even fractions of a percent are commonly encountered on the tracking spreadsheet. In automotive, light and heavy truck and transportation equipment manufacturing, quality vigilance must be high, given stringent industry expectation levels. However, life on the ground reveals more to the story.

In 2018 Quality Liaison Services of North America (QLS) tracked 10 million parts connected with client engagements in the company's proprietary project management tracking software: QLS Dot. Of those 10 million parts handled, fully 20% were found to be defective, i.e. contain some level of non-conformity.

This is an astronomical number, probably unexpected and even surprising to read here by most design and production teams. Quality numbers in this range can generate havoc downstream. Potential overnight shipping and repair costs, production downtimes, or even end product failure due to lack of detection, all impact the bottom line significantly, placing strain on business relationships and in worst case scenarios, strain on end user satisfaction.

This 20% number represents a broad sampling of short run parts for multiple customers as opposed to a particular anomaly in much larger runs over time, so it does seem to accurately portray a real-world snapshot, allowing for assumptions in other similar environments, and presenting significant opportunity for improvement.

Opportunity for improvement
Considering this type of scenario, a third-party expert partner becomes a valuable resource, working onsite to assist in mitigating risk, helping to correct nonconformities. A reliable liaison then, between OEM and supplier, is one method to enhance the entire quality process.
QLS obviously discovered this high percentage number of nonconformities in parts already in production. Whether the parts are still located at the supplier facility or already on site at the OEM, QLS recommends a repair process in most cases, and has a track record of recovery for a high percentage of existing parts. However, the best time for improving quality via elimination of nonconformities, is prior to new product launch.

**Identifying issues in a new product launch**
QLS recommends and implements a best-practice approach in the process leading up to a new product launch, to eliminate quality issues in production. The approach is by no means proprietary, and at first glance many manufacturers might downplay the need for quality assessment by a third party at all, exactly because these best practices should be considered second nature to product development and production teams.

It's worth noting that QLS project documentation again demonstrates that when it comes to new product development / launch, that local factors can often contribute to details being overlooked. Time pressures, the human factor, communication issues between engineering departments and the shop floor, new employees, new suppliers, material availability, and any number of other factors in any given combination may unknowingly lead to a critical nonconformity downstream.

In a new product development / launch process, careful adherence to the process outlined at a high level in the following sections, can mitigate risk as a new product is brought into production in preparation for integration with the OEM operation.

**Engineering Validation**
As much as possible, perfection takes place on the front end, that is perfection within the confines of the real situation onsite. At this point drawings are reviewed, design is evaluated according to traditional factors. How will the products be created, run, assembled on the shop floor, integrated into existing operations? What are the available skills from employees, available equipment and technology, in house or outsourced components, component availability and cost, realistic tolerances and specifications, along with any number of additional factors?

Internal design teams do this every day. There are times however, when leadership / assistance by
a third party who also understands the particular OEM requirements may help highlight factors which may otherwise be deprioritized or even overlooked. Such a consultant may also provide valuable contributions based on a broad understanding of similar production scenarios, while taking care not to infringe on proprietary methods. The engineering evaluation is the first critical step in "getting it right" in the new product design / launch.

**Quality Validation**
In the quality validation the design goes into action. Here as the subassemblies and assemblies begin to take shape, the EV is tweaked, assumptions are proven or corrected, concepts are tested, efficiencies are created or ruled out. The QV is the opportunity to prove the EV.

QLS recommends a Six Sigma approach for problem solving analysis during this phase, focused on achieving a consistent result considering all factors such as design requirements, shop floor environment, cost expectations, etc. As the team consolidates the QV, it's important to ensure that the test conditions will be available when needed within the facility, or that new personnel / operations / equipment can be secured and implemented in a timely manner. Additionally, a thorough knowledge of the OEM can be of great value for particular types of components, especially those requiring value added operations.

**Volume Validation**
Once the concept is proven or modified on an individual part, it is ready for volume testing. It is critical for the process and thus the part to be issue free in a volume run. A minimum run of 60 parts is recommended as a test standard for a product designed around typical short run volumes.

During volume validation data is collected throughout each production step. Significant characteristics or questions which may have arisen during the EV and QV are now monitored. This is the time to create an issue-free process, and a high quality part.

**Issue repair and resolution**
Since OEMs place consistent quality demands on suppliers, monitor of such quality contributes to the competitive landscape among Tier I and Tier II companies. Suppliers are often recognized for consistent success, yet consistent success is also a minimum expectation. Failure to comply with the minimum can mean be hell to pay. A defective part can generate a myriad of expense and
scheduling issues, causing OEM production to malfunction while the situation is corrected. These issues affect the entire value chain; supplier, manufacturer, dealer, end customer.

When non-compliance reaches a critical point or continues to repeat, it may cause the OEM to add self certification (CS1) inspection to the process, regardless of cause (supplier oversight, OEM requirement modification, etc.). Not only does this reflect poorly on the supplier but it adds extra steps.

When the situation escalates past self certification, "requiring" outside help in repair and certification for non-conformity (CS2), the situation has often progressed beyond critical, but opportunities for efficient correction still exist. In the high percentage number of issues mentioned earlier (20%), fully 80% of those nonconformities were able to be corrected without removing the parts from the OEM facility and the parts were used as scheduled.

**Issue monitoring and enhanced communication**

While it proved productive to bring in third party quality expertise under CS2 conditions, strategic partnership with this same expertise, provided everyday by QLS onsite at dozens of locations, can eliminate issues altogether. QLS maintained a 0 PPM defect rate throughout 2018 within all customer engagements.

There are two key components to achieving this level of result. The first is onsite service at both OEM and supplier facilities. Knowledge and visibility on both sides of the relationship is invaluable in the quality process. Even considering long-term OEM-supplier relationships, having a representative on site focused on bridging quality gaps serves to enhance all phases of the product development / production process.

This type of service also enables real-time visibility for all parties. QLS utilizes a proprietary project management system QLS Dot, which handily unveiled the dark truths highlighted on the first page of this paper, and constantly delivers valuable insight to all project teams connected to the system.
QLS Dot will always display the latest real-time updates on any device with an internet connection. Project data is entered, producing standard and customizable views along with standard and customizable reports. QLS Dot enables an enhanced level of communication between OEM and supplier, ultimately reducing the number of emails, phone calls, virtual and in-person meetings, simplifying project management and adding productivity throughout the value chain. Given the traditional production meeting taking place in many facilities early in the day, the system automatically generates a morning status report, to assist at this opportune moment.

**Conclusion**
Companies are working hard to self-police quality, but the actual number of nonconformities are probably higher than reported in most production environments.

The best way to ensure quality accuracy and consistency is at product development / launch, where a thorough EV, QV and VV are performed.

Whether to correct existing issues, or prevent them, third party quality assessment, tracking, and repair presents numerous benefits for the OEM / supplier relationship, delivering significant cost savings, efficiency and ultimately better products.

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