



# **Nissan Powertrain Case Study**

**Nissan drives information out of data for greater shopfloor visibility**  
***Lighthouse Shopfloor-Online interfacing with many data sources for seamless information delivery where and when it is needed***

Multiple sources across the Powertrain Division deliver a huge volume of data from which the operators, engineers and managers must extract real information on which to base decisions and produce reports. The accuracy of that data and its accessibility cannot be underestimated. Nissan Powertrain recognizes the critical nature of this data held on the shopfloor and it has taken steps, with Lighthouse Systems, to implement software that has reduced the labour requirements for extracting useful information about the processes, improved operational efficiencies, enhanced quality controls and enabled better management of the production facilities as a whole.

### **Introduction**

Renowned for its innovative designs and its ability to produce cars competitively and to meet the needs and desires of its customers, Nissan has always sought to work with the best in the business. This ethos is imbued across the organization and in its Powertrain division in Sunderland this rings true. Here it applies the rule to its systems and Nissan was quick to see the potential of computerization on the shopfloor in the early 1990s.

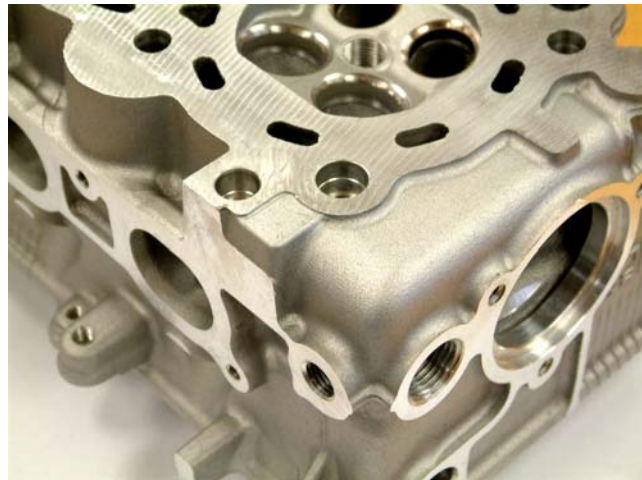
### **Taking the first steps**

Moving from a cumbersome paper-based approach to a computerized system was the first step and this gave the Powertrain engineers a strong insight into the many possibilities of the SPC and quality systems available on the market.

When Powertrain reassessed its shopfloor SPC system, in the run up to the Year 2000, the engineers judged that it was not meeting all of the requirements of the division and they began researching the industry for more viable alternatives. The decision was taken to implement Lighthouse software in 1999 to provide greater manageability on the shopfloor and to enable information to be displayed in different ways across the division. The software had to be scalable as the plan was to prove the software in the Powertrain division with the option to expand into other areas of

the plant if successful. Five years down the line, in 2005, Powertrain decided to continue with Lighthouse but to upgrade to their latest software in the form of Shopfloor-Online, delivering a range of powerful features in a user friendly and intuitive environment.

Dave Warne, Engineer - NMUK QA Powertrain, comments, “We were looking for a factory information system that would bring all of our data sources together in an intelligent way and deliver a single source of information in a way that is easily understood by everyone using the system. We wanted something web based so that data could be accessed from any PC on the shopfloor or in the offices without the need for special software installations on individual PCs, We also wanted something that would not cost the earth to implement, operate and support. Lighthouse Shopfloor-Online was the ideal fit for us. It promised to deliver a factory information system approach that would enable us to understand and monitor the performance of our plant operations. It is delivering on that promise!”



### **Integrating with existing machines**

The Powertrain division focuses on critical component manufacture. It has a casting shop producing cylinder heads. It has complex machining for cylinder heads and cams; and axle component manufacture and assembly. These are complex processes making high volumes of complex parts, with thousands of features, many with specifications in microns. The ability to operate with existing machines is key to this implementation. Shopfloor-Online is being used to accept data from a number of different sources, including CMMs (Coordinate Measurement Machines) from a number of different vendors (including Mitutoyo and Zeiss). There is a huge amount of data to collect in different locations, different frequencies and all in different formats. This has greatly reduced the level of manual intervention required to extract data from the systems for use in reports and analyses.

Interfacing with the CMMs means that the huge volume of data that they collect at each and every stage of the production process is available and useful to those responsible for managing the process. Nissan has made very careful and selective use of SPC control limits to allow the software to look at the thousands of features being monitored and raise alarms to potential process problems. Alarms are raised to alert those responsible to the status of the process at any given time and they are able to drill down into any issues to track the performance of specific moulds or tools operating on specific machines. This can often result in problems being highlighted and rectified before they even occur. Such a forward warning system gives all concerned greater peace of mind and confidence in the production process as a whole.

Although the system is measuring and analyzing thousands of variables at any time, they are classified into four categories in order that the operators can deal with the issues that are most important first. When an alert is raised, the operator is then able to drill down into the process to get more specific information about a fault. This information is also emailed to the appropriate personnel in order to speed the response to the alert.

Dave Warne comments, “Shopfloor-Online is a great management tool for us. We have a colour coded system in place that shows us where any issues lie and then allow us to investigate the problems usually before they occur. Everything is delivered to us in the form of raw data and in easy to reference graphs and charts. This means that we can see at a glance the overall picture of the processes real time. That is a powerful situation and it means that we can work smarter than ever before.”

### **Looking to the future**

Environmental issues are ever more important in the industrial world of today. It is vital that plants like Powertrain monitor their environmental impact and retain certain controls over the levels of waste that they produce. Although this is closely monitored at present, a paper-based model is being used and, as with the other paper processes, this is incredibly time intensive. The plan is to perform a pilot study using Shopfloor-Online in the near term.

Other changes will involve integrating more systems into the central Shopfloor-Online infrastructure. There are still some stand alone databases within the Division and these will be brought into the factory information system.

Dave Warne concludes, “We are using Shopfloor-Online within Powertrain area and we are actively promoting its features and value to other parts of Nissan because we believe that others could benefit from this software. In fact, we have been using the software for a new vehicle trial and it has been so successful that it has attracted a great deal of attention in other areas of the business. We look forward to a long and mutually beneficial relationship with Lighthouse for many years to come.”