Efficient test facility operation

automotive testing EXPO 2015 EXHIBITOR ★ NOVI ★ ★ MICHIGAN ★

Total test optimization is a methodology developed by ACS that improves use and efficiency of test facilities

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Maximizing the use of a test facility, including equipment and personnel, is one of the biggest challenges of owning and operating a technical center. Clearly identifying business unit and test program goals, understanding operational costs and defining and documenting customer/product requirements, are critical to ensuring full use. Additionally, metrics that were once applied primarily in production environments are now finding their way into R&D testing.

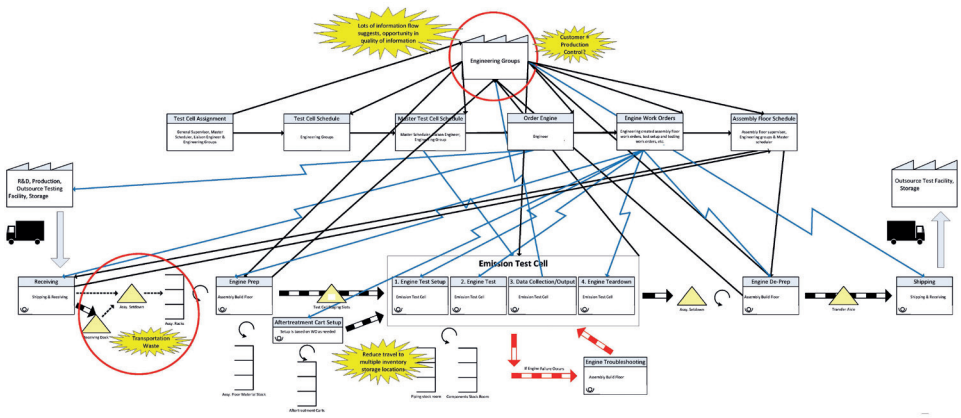
An OEM engine manufacturer had the opportunity to increase cell use by minimizing engine changeover time. Due to a shift from regulatory compliance to product development, its current reactionary approach to test setups and teardowns was no longer sustainable.

The manufacturer did not have personnel with an outside, impartial perspective and enough time to analyze, evaluate and implement improvements. Its resources were tied up with the day-to-day activities of its testing operations, and thus needed an extension of staff with the expertise, experience and time to help improve the test process.

ACS introduced the manufacturer to total test optimization (TTO), a methodology to analyze and improve the efficiency and effectiveness of the testing process – from work order generation through test setup and execution, to data acquisition and data management. TTO is a proven process for identifying and implementing solutions that maximize the use of capital resources, minimize waste and improve overall efficiency.

The TTO methodology starts with a thorough on-site review of the existing test process, including site visits, observation and interviews with key personnel. TTO helps companies identify and document challenges they face in balancing safety and regulatory requirements, facility concerns and personnel constraints with their internal customers' test requests and schedules. Tools such as process flow diagrams and value stream mapping are used to identify improvements. These suggested solutions provide the client with a strategic and tactical implementation plan to guide investments.

Identified improvements and solutions often include



ABOVE: Process flow diagrams and value stream mapping provide insight into current test processes

a combination of process changes, standardized work documentation, inventory management, planning and scheduling, data management software, facility changes and equipment upgrades. For the engine OEM, the TTO analysis focused on the reduction of setup time to positively impact total cycle time from one test to the next. Part of the solution was a modular, flexible approach to exhaust and charge air piping, including flanges and connections, while still achieving the required pressure drop within the total volume constraints of the systems. To ensure timely implementation, ACS designed and manufactured these specialty components and assisted the client with inventory management.

ACS's TTO approach has found that client success is maximized when there is full implementation of solutions rather than a piecemeal approach.

When a client's internal resources are limited, ACS has performed 3D scans of the test cells, developed and produced 3D models for better planning before the engine arrives, designed and installed match plates for quicker connection of various size engines, and selected driveshafts that can be used to test the manufacturer's entire product range. Some clients have taken a kit approach in order to assure that all the parts needed for an engine swap are both readily available and accessible.

Long term, fully implemented TTO methodology yields the greatest improvements. For example, at a technical center for an engine OEM it has yielded long-term results of a 32% efficiency increase for performance testing, 23% for endurance testing, and 50% for federal certification testing. ❮