

Accelerated Test Success Story

Problem: A major automotive supplier funded SRC to identify the reliability of its current and future systems. The system reliability was needed to quantify the consequences of extending the fuel system's warranty from 10 years/100,000 miles to 15 years/150,000 miles. The future system will replace many mechanical components with electrical or electromechanical components that provide newer technologies. Long-term reliability was a concern not only for warranty-related costs, but the market share that the automotive supplier hoped to gain introducing this proposed design.

Approach: SRC completed a reliability prediction of the current and proposed systems to provide a baseline to compare the systems. Due to the use of components with limited historical reliability data we concluded that an accelerated life test should be developed that could gauge the long-term reliability of the current and proposed systems. SRC worked with the automotive supplier to identify the field environmental conditions for these systems; including ambient temperature, operating temperature, vibration levels, and other system-specific parameters. Based on these conditions, accelerated life tests were developed for thermal cycling, random and pseudo random vibration, and high temperature/voltage.

Solution: Three accelerated life tests were developed for the automotive supplier to quantify the reliability at a given confidence level for their existing and proposed systems. SRC created a table identifying the number of failures that can occur during the tests based on the 15-year lifetime consistent with a 0.98, 0.95, or 0.90 reliability with 90%, 75%, or 60% confidence. The supplier can use these results to quantify the warranty costs associated with the current and proposed systems over the 15-year lifetime. The supplier could also determine if introducing a system with new technology and limited reliability data would result in an unacceptable number of failures. Such a system could greatly affect the market share expected by this supplier for the new design.

SRC CONSULTING SERVICES

SRC consulting services address your toughest reliability, maintainability, and supportability (RMS) challenges. Since 1968, we have provided integral support to our commercial and defense customers to achieve their RMS goals. Beyond accelerated reliability test plan and procedure development, the trained and experienced reliability professionals at SRC provide expert support to improve your bottom line and meet your customer and mission requirements through:

- Training in reliability and related disciplines
- Benchmarking of your products, processes, standards, and metrics against R&M best practices
- Developing and implementing RMS program plans
- Facilitating RMS task (i.e., FMEA, R&M assessment, sparing analysis, etc.)
- Optimizing maintenance using reliability-centered maintenance techniques
- Identifying and assessing reliability goals and requirements
- Conducting root cause and statistical analysis of problem areas
- Collecting and analyzing your data for customized engineering solutions
- Providing practical tools for engineers

The Alion SRC is ready to help you improve the availability, readiness, and total cost of ownership for your product. To get started, contact us today.