

# CASE STUDY



## SHAININ OVERSTRESS PROBE TESTING RESULTS IN SUCCESSFUL LAUNCH WITH HIGH RELIABILITY

A company which designs and builds heavy duty propulsion systems was about to launch a new product that combines hybrid battery technology with a bus power train system. By using Overstress Probe Testing they shortened test time and discovered failure modes they would have missed if they had applied their conventional validation testing. Targeted design changes were implemented and the failures never occurred in their production units.

### THE PROBLEM

One of the biggest challenges they faced was how to meet the aggressive design life of 12 years and 400,000 miles for the battery pack, in a reasonable amount of test time and get meaningful results.

### THE APPROACH:

The company and Shainin established a project team and set out to develop a test which was based on Overstress Probe Testing principles. The test included multiple environments and stresses which the battery pack would be exposed to in the field. These environment and stress levels were measured on field prototypes and used to design the test. Part of the test included increasing multiple stress levels in the correct ratio, which was critical in creating failure modes which were representative of what the customer might experience. The testing of the product to failure allowed the team to identify the weak links in the product design by revealing the dominant, earliest failure modes. One of the failure modes was actually an interaction of multiple environments, which would not have been detected if their traditional single environment testing had been used. Testing the product to failure allowed the team to compare the time/stress values of the failures to the time/stress values from the customer usage. Management was then able to make business decisions with full knowledge of the margin of safety. With a shortened test time and discovery of these likely failure modes, targeted corrective actions were implemented and eliminated the possibility of them occurring in the field.

### BENEFITS

1. Shortened test time.
2. Product tested to failure, allowing reliability statistics to be applied.
3. Realistic failure modes discovered and corrected.
4. High field reliability.

