Dynamic and Environmental Test Facilities

Performing vibration, shock, and thermal testing of components in the lab or in the field

As a result of our advanced weapons design and testing program, we can perform a wide variety of tests on component and system designs. We have conducted tests, for example, on electronic components, mechanical assemblies, and transportation containers. We employ test engineers and technicians and electronics support personnel with experience in the design and execution of vibration, shock, acceleration, thermal, and humidity tests. We routinely perform large-scale field testing utilizing equipment not captive to the laboratory. Our unique technical expertise and test facilities are available for wide-ranging industrial use, such as the torsional shock tests on a transmission that we recently conducted for the automotive industry.

Test design, facilities, and support

We use a concurrent engineering approach when performing tests. Engineers and technicians work closely with customers from the early stages of test unit and fixture design and instrumentation selection through data analysis and interpretation. We combine sophisticated computer modeling and testing results to produce a comprehensive analysis package. Our program resources include large, modern, and comprehensive test facilities and support equipment. We can accommodate unusual instrumentation; hazardous, toxic, explosive, and/or radioactive materials; or environmental problems encountered during testing. We recently participated in large-scale field tests involving hazardous materials for the U.S. Air Force, in which Lab experts prepared the environmental assessment and conducted site restoration.

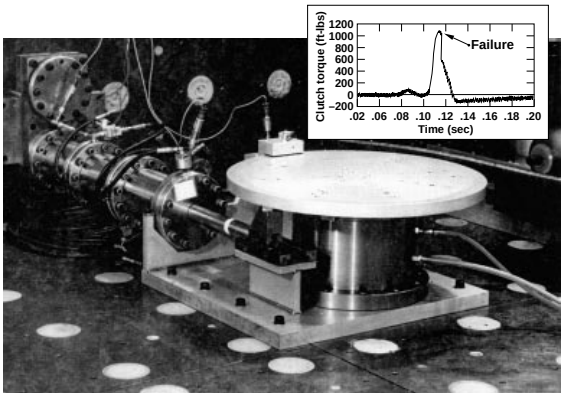
APPLICATIONS

- *Earthquake testing*
- *Transportation shock and vibration tests*
- *Thermal testing*
- *Load tests*

Dynamic and environmental tests

Our dynamic test capabilities include vibration and shock environments. Transportation vibration environments can be accurately reproduced as well as earthquake shocks. Other handling shocks caused by impact, impulse, and drops can also be simulated. The desired shock level and time signature can be achieved by using specially selected impact surfaces.

We can also produce a range of thermal, thermal shock, and humidity environments from 100 to 250°F. These environments can be combined with our dynamic test capabilities to accurately represent real-life conditions.



The Torsional HYGE (inset: an example of a data plot from a test run).

Data acquisition

Analog and digital acquisition systems as well as high-speed video are used to record the data; processing and analysis is performed on mainframe or personal computers, and can be done in real time at the test site.

Availability: Our dynamic and environmental test capabilities are available now for collaboration with industrial and government partners. Testing can be tailored to meet individual requirements.

Contact

Wendell Moen
Phone: (510) 422-8650
Fax: (510) 423-5679
E-mail: apodaca1@llnl.gov
Mail code: L-125