

Technical Testing and Analysis Center

The Oak Ridge National Laboratory (ORNL) Sensor Science and Technology (SCR) Group is widely known for its sensor development and testing capabilities. Facilities for testing are crucial to SST's activities, and along the way to becoming a world leader in sensor technology, SST has developed world-class user facilities such as the Technical Testing and Analysis Center (TTAC).

Capabilities and Experience

TTAC, a state-of-the-art testing facility, has a broad range of capabilities for simulating environmental conditions of temperature, humidity, air pressure (altitude), magnetic fields, EMI/EMC, line noise, voltage variation, vibration, and shock. With automated data collection and review-on-demand capabilities, testing can span 24-hour cycles. TTAC has a full-time staff of engineers and technologists with additional experts available when needed.

Advantages

Following are some of the many advantages of working with SST staff and TTAC.

- TTAC staff can perform systematic, comparable testing to ensure your equipment meets application needs.
- TTAC staff can establish standards-based testing protocols and characterize field environments to ensure the technical basis of requirements.
- Protocol validation testing at TTAC will ensure requirements can be met in a reasonable amount of time.
- Testing through TTAC will ensure that environmental vulnerabilities and operational limitations are understood and either eliminated or mitigated before a device is fielded.
- When you access TTAC and its resources, you also gain access to other world-class ORNL facilities and resources, including the Environmental Effects Laboratory.

Resources

Chambers

- Temperatures ranging from -0°C to $+170^{\circ}\text{C}$.
- RH controlled from 3 to 99.
- Atmospheric pressure evaluations.
- Dust, moisture, and salt spray/fog.



Technical Testing and Analyses in Support of National Missions

Purpose: Independent verification testing of field deployable systems. Validation studies are conducted on emerging sensor and detection systems to ensure new technologies are suitable for use.

Sponsors: Department of Energy, Department of Defense, U.S. Department of Homeland Security, and private industry.

Features:

- Accredited laboratory facilities.
- Carefully characterized equipment.
- Confidential work environment.

Users: Decision-makers from federal technology development and deployment programs. Scientists and engineers from universities, industry, and government laboratories.

Complementary Facilities:

- More than 20 ORNL user facilities for additional characterization and development.

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View of one of the TTAC laboratories.

Power Line Test Systems and Other Specialized Testing

- Frequency source.
- Voltage source.
- ECAT pulsed-EMI test system.
- Magnetic fields.

Ionizing Radiation

- Gamma.
- Beta.
- Alpha.
- Neutron.
- X-ray.

Radio Frequency

- GTEM wave cell (up to 18 GHz at 1 kW input power).
- Anechoic chamber.

Vibration Systems

- Sine and random vibrations from small packages to 5,000-pound items.



TTAC vibration testing area.

Driven Linear System (DLS)

- Controlled linear movements to characterize response of devices that measure or detect movement.



TTAC magnetic susceptibility, salt fog, and DLS laboratory.



TTAC large electromagnetic anechoic chamber.

Contact Information

To find out more about TTAC and other SST user facilities and how you can use them to improve your products and processes, please contact Peter Chiaro (chiaropj@ornl.gov) at 865-576-4598.