

Purpose

The mission of Infrastructure Technologies is to apply the Laboratory's sciences and technology base to the many issues facing today's critical infrastructure.

Sponsor

U.S. Department of Energy, Federal Aviation Association, public power and gas utilities

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Applying Science & Technology to Today's Issues

Infrastructure Technologies' programs address counterterrorism and more

The mission of Infrastructure Technologies (IT) is to apply the Laboratory's science and technology base to the many issues facing the design, operation, and maintenance of today's critical infrastructure. The program's funding comes from the federal, New York State, university, and private sources, for programs

in: advanced underground imaging, precision mapping systems, sensor development including wire degradation, green building technologies, risk management, and, most recently, energy assurance for counterterrorism. IT leads the Laboratory's investment in the High Technology Incubator concentrating on energy and the environment. IT also manages Brookhaven's interests in the Cornell Transportation Infrastructure Consortium.

Counterterrorism

In the area of counterterrorism, Infrastructure Technologies is providing interdisciplinary capabilities and multifaceted technical expertise to responder organizations and government agencies at various levels. Solutions involving a combination of existing technologies and needed R&D efforts of two years or less are also being worked on. Long-term solutions that involve breakthrough needed R&D efforts of greater than two years are also being addressed.

IT has ongoing programs to develop and apply vulnerability and risk assessment tools to determine the need of critical infrastructure at the state and regional level for power, gas and liquid fuel, communication, transportation, water, and financial/banking.

TEMASU

The TERrestrial MAGnetic SURvey, or TEMASU, is a device for mapping hidden ferromagnetic structures. Currently nearing completion, the instrument was designed for the particular task of locating cast iron pipes below street pavements. It was shown that details, such as the position of belljoints in a pipeline, as well as pipesleeves or casing, can be pinpointed. With



Bob Hall, Head of Brookhaven's Infrastructure Technologies Division

such information at hand, it is possible to open up the pavement for pipe repairs at precisely the required location, thus minimizing maintenance cost, traffic disruption, and noise.

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FAA Tera-Hertz Reflectometry

The Federal Aviation Administration (FAA) program called Tera-Hertz Reflectometry-Based System is aimed at testing non-destructively the insulation around aircraft wiring. Recently there have been events that point to the fact that wire insulation on older aircraft may be degraded to the point of no longer being able to ensure the safe transfer of electrical current. What is needed is a diagnostic technique to determine faults in the electric wire insulation that are precursors to potential hazardous wire failures.

The Laboratory is conducting R&D that will lead to a new method to measure the condition of wire insulation based on the transmission of very high frequency (tera-hertz range) signals through the insulation only. By using the National Synchrotron Light Source at Brookhaven, researchers are exploring the nature of signal propagation and reflection in aircraft specific insulation material. At the end of this two-year program, an early, field-deployable prototype of a new instrument is expected to be demonstrated.

Brookhaven National Laboratory is managed for the U.S. Department of Energy by Brookhaven Science Associates, a company founded by Stony Brook University and Battelle.

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Brookhaven is working with New York City to develop a sensor network that could help protect lower Manhattan.