



Advanced Monitoring Systems Initiative (AMSI)

The Advanced Monitoring Systems Initiative (AMSI) project has been in existence since 2002. In the short time period since then, AMSI has successfully developed, tested, and/or demonstrated over 30 advanced sensors and monitoring systems for applications in environmental management, nonproliferation, national security response, and other areas of national interest.

AMSI's goal is to bridge the gap, often called the "valley of death", between end-users needing innovative solutions to sensing and monitoring problems, and technology developers working to address the needs.

AMSI Activities and Services

- Working with end-users to define their sensing and monitoring system needs.
- Facilitating interactions between end-users and technology developers.
- Providing engineering support in areas such as rapid prototyping, packaging, electronics, and communications.
- Testing and demonstration, both laboratory-scale and full-scale in the field, at locations such as the Nevada Test Site (NTS) and Hanford Site.
- Evaluation of results, including assisting users and developers in evaluating results.
- Transforming test data into information products for end-users.

Recent Successes

- ✓ **Automated Hexavalent Chromium Monitoring System** - In partnership with Burge Environmental, design, fabrication, and testing of an automated Cr(VI) monitoring system for monitoring shallow groundwater wells along the Columbia River, Hanford Site, Washington.
- ✓ **Atmospheric Chemical Sensor Array** - Implementation of chemical sensor arrays as a new field diagnostic capability supporting tests at the Nevada Test Site.
- ✓ **Wireless Sensor Platform** - Development and testing of a new wireless sensor platform in partnership with Idaho National Laboratory.
- ✓ **Embedded Piezoresistive Micro-cantilever Sensors** - Development of chlorinated hydrocarbon detectors for groundwater monitoring in partnership with Northern Arizona University.
- ✓ **iHistorian for Efficient, Real-time Data Management** - Implementation of field data tool for real-time analysis of dynamic data sets.

Overall Experience

In the past few years, AMSI has seen significant growth and many successes. Although the initial focus of AMSI was environmental management, the project has expanded to include other areas of interest within and outside of the U.S. Department of Energy (DOE). This experience includes:

Monitoring

- Chemical releases, e.g., organics, toxic gases, signature chemicals
- Radiation and radioactive material, e. g., Special Nuclear Material, actinides in water
- Groundwater monitoring, e.g., chlorinated hydrocarbons, tritium, strontium, technetium, chromium(VI)

Technology Partners

- Private companies, e. g., Burge Environmental, Inc.
- National Laboratories, e. g., Pacific Northwest National Laboratory, Idaho National Laboratory
- Universities, e. g., Nevada Universities, Northern Arizona University, Boise State University

End-users

- DOE Sites, e.g., Hanford, NTS
- Nonproliferation programs
- National security programs
- Counterterrorism programs

Project Location

The AMSI project is located at the DOE National Nuclear Security Administration Nevada Site Office (NNSA/NSO). It is managed by the Nevada Site Office Management and Operations Contractor, National Security Technologies, LLC (NSTec).

Points of Contact

Charles Lohrstorfer, NSTec, (702) 295-5688, lohrstcf@nv.doe.gov
Dr. Rick Venedam, NSTec, (702) 295-5458, venedarj@nv.doe.gov

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