# SERDP and ESTCP Announce 2012 Projects of the Year

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## Project-of-the-Year Awards Showcase Program Successes

Congratulations to the six SERDP and ESTCP Projects of the Year, recognized for research and technology developments with significant benefits to the Department of Defense (DoD). These outstanding efforts are helping DoD achieve its mission while improving its environmental performance. Recipients of this prestigious honor follow with links provided to highlights of their award-winning projects. The **Environmental Security Technology Certification Program** (ESTCP) is DoD's environmental technology demonstration and validation program. The Program's goal is to identify and demonstrate cost-effective technologies that address DoD's highest priority environmental requirements.

# Cold Spray Technology for Aircraft Component Repair

The U.S. Army, Navy, and Air Force have experienced significant corrosion problems with magnesium alloys that are used to fabricate many different types of aircraft components. The most severe of these problems are associated with large and expensive transmission and gearbox housings for rotorcraft which have to be removed prematurely because of corrosion. Many of the components cannot be reclaimed because there is no existing technology that can restore them adequately for service. The Corpus Christi Army Depot has millions of dollars of used magnesium housings waiting to be reclaimed. Overall, premature failures of these components cost the Department of Defense approximately $100 million per year.

Mr. Victor Champagne of the U.S. Army Research Laboratory and his team have developed a cold spray process that involves accelerating aluminum alloy particles to high velocities and impacting them on the surface of the magnesium alloy components. In their project, the cold spray process was demonstrated and validated to be a cost-effective, environmentally acceptable technology that could provide surface protection, as well as a method for restoring magnesium components that have been removed from service. The process can be incorporated into manufacturing, and portable systems can be developed for field repair. A cold spray demonstration facility was established at the Navy's Fleet Readiness Center – East in North Carolina (formerly the Naval Air Depot Cherry Point).

This project resulted in the implementation of cold spray by Sikorsky Aircraft Company. Both Sikorsky and the Army Program Office for the UH-60 Blackhawk helicopter have approved cold spray for use as a repair technology for one UH-60 magnesium component, with other approvals expected soon. The U.S. Army Research Laboratory developed a Military Process Specification, "MIL-STD-3021, Materials Deposition, Cold Spray," that was selected for the Defense Standardization Program Award in 2008. With future implementation, the cold spray process should provide a significant return on investment through increased in-service life and the ability to reclaim extremely valuable components.

For this important work, Mr. Champagne received a 2012 ESTCP Project of the Year Award.

## Project Team

**Victor Champagne (Army Research Laboratory)**

- Robert Kestler (Fleet Readiness Center – East)
- Robert Guillemette (Sikorsky Aircraft)
- Michael Kane (Army Aviation Missile Command)
- Timothy J. Eden (Applied Research Laboratory, The Pennsylvania State University)
- Keith Legg (Rowan Technology Group)
- Darren Gerrard (Defence Science and Technology Organisation, Australia)
- Stacey Luker (Joint Strike Fighter Program's Environmental, Safety and Occupational Health Team)

## Related Resources

- Can a Cold, Green, Supersonic Spray Save the Black Hawk? (FoxNews.com, January 3, 2013)
- ARL Technology Named 2012 Project of the Year for Environmental Technology, Science (www.army.mil, December 2, 2012)
- ARL Technology Awarded for Environmentally Friendly Cold Spray Technology (Vertical, January 4, 2013)

SERDP and ESTCP are the Department of Defense's environmental research programs, harnessing the latest science and technology to improve DoD's environmental performance, reduce costs, and enhance and sustain mission capabilities. The Programs respond to environmental technology requirements that are common to all of the military Services, complementing the Services' research programs. SERDP and ESTCP promote partnerships and collaboration among academia, industry, the military Services, and other Federal agencies. They are independent programs managed from a joint office to coordinate the full spectrum of efforts, from basic and applied research to field demonstration and validation. The Program's goal is to identify and demonstrate the most promising innovative and cost-effective technologies and methods that address DoD's high-priority environmental requirements. Projects conduct formal demonstrations at DoD facilities and sites in operational settings to document and validate improved performance and cost savings. Transition challenges are overcome with rigorous and well-documented demonstrations that provide the information needed by all stakeholders for acceptance of the technology.