

# DHS Science and Technology Directorate Standards Office—Robot Response Standards Program

## Natural disasters and terrorist activities provide vivid examples of the need for robotics

Robot performance standards and test methods were not in place leading up to and immediately after the terrorists' events of 2001. The President's 2002 budget included a priority to fund "new and better technologies" for emergency responders, and Congress followed suit in 2004 with language directing the Department of Homeland Security (DHS) to develop criteria for certification of urban search-and-rescue robots.

Our first responders are called upon to put their lives on the line every day. They need the right tools to protect the public and their own lives. Robots can provide capabilities that can be used to reduce exposure in dangerous situations and increase response times in search and rescue operations. With the development of the Robot Response Standards, manufacturers are able to produce increasingly proficient robots that are suitable to the responders needs.

## Robot Response Standards Program accomplishments to date

To quantify the key capabilities that are needed in response robots, the Department of Homeland Security (DHS) Science and Technology Directorate (S&T), and its many partners, have developed a comprehensive suite of standard test methods and associated performance metrics.

This includes the capabilities of robots intended for all kinds of incidents and emergencies. The test methods address responder-defined requirements for robot mobility, manipulation, sensors, energy, communication, mapping, human-robot interfaces, logistics, and safety. They are intended for remotely operated ground vehicles, aquatic vehicles, and small unmanned aerial vehicles.

To date, fifteen test methods have been formally published through ASTM International and an additional fourteen test methods are in development. When the standards are released, they will enable first responder agencies to procure robotic systems that have performed to exacting methods tested at these events. The robot performance data information provided gives emergency responders the ability to:

- compare different robot models
- make purchasing decisions
- understand deployment capabilities

## Partners

The Federal Emergency Management Agency Urban Search and Rescue Task Forces, the National Bomb Squad Commanders Advisory Board, the DHS National Protection and Programs Directorate Office of Bombing Prevention, and ASTM International, a globally recognized leader in the development of international voluntary consensus standards.



Robot manipulation is a key element to the Robot Response Standards Program during testing (bottom photo) and real life scenarios (top photo).



**Homeland  
Security**

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To learn more about Standards & Test Methods for Urban Search and Rescue (USAR) & Bomb Robots, contact Philip Mattson, Director, DHS S&T ASOA/Office of Standards at [Philip.Mattson@hq.dhs.gov](mailto:Philip.Mattson@hq.dhs.gov)