

Robots for Urban Search and Rescue

Performance Metrics and Standards Development Program

Public Forum

May 13, 2005

Department of Homeland Security Science &
Technology Directorate, Standards Portfolio

National Institute of Standards and
Technology



Agenda

9:00 AM	Welcome and Introduction	Elena Messina, NIST
9:05 AM	DHS Standards Program	Bert Coursey, Science and Technology Directorate, Standards Executive
9:20 AM	Emergency Preparedness and Response R&D	Nancy Suski, Science and Technology Directorate, Emergency Preparedness & Response Portfolio Manager
9:35 AM	DHS Emergency & Preparedness Response/FEMA	Peter Smalley, Federal Emergency Management Agency Urban Search and Rescue, Program Specialist
9:45 AM	Program Overview	Elena Messina
10:10 AM	Integrated Product & Process Development	Roger Moulder, James Gregory Associates
10:30 AM	Break	
10:45 AM	Requirements Definition Process	Adam Jacoff
11:00 AM	Wave 1 Candidate Requirements	Adam Jacoff
11:30 AM	Test Methods	Adam Jacoff
11:50 AM	Human-System Interaction	Jean Scholtz, NIST
12:05 PM	Robots and Capabilities Classifications	Craig Schlenoff, NIST
12:20 PM	Building and Disaster Classifications	Elena Messina
12:30 PM	Lunch	
1:30 PM	Next Steps	Elena Messina
1:45 PM	Feedback from Solution Providers	All
3:30 PM	Adjourn	

DHS Standard Test Methods for Performance and Use of US&R Robots

Goal

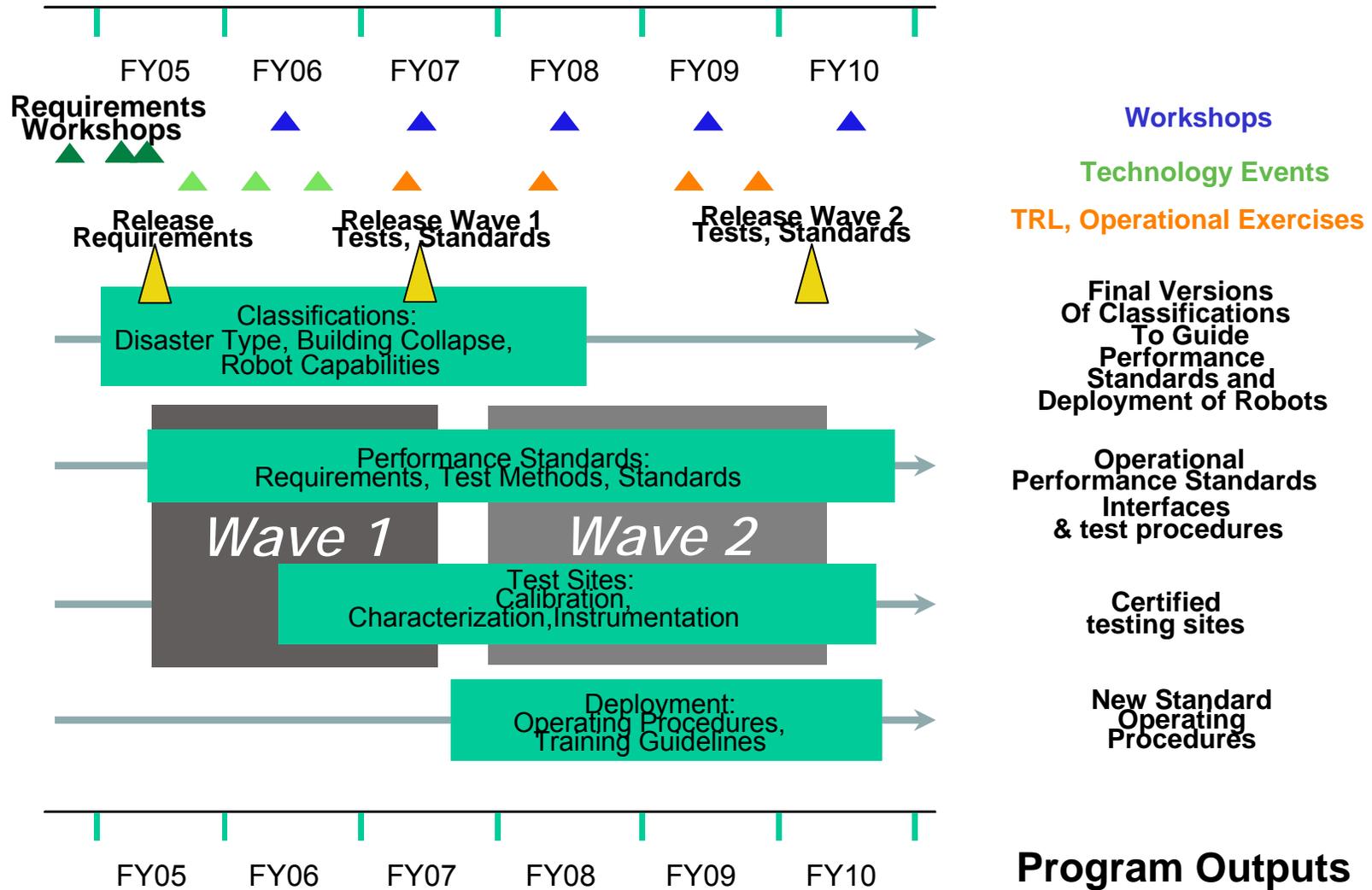
Develop comprehensive standards for the development, testing, and certification of effective technologies for sensing, mobility, navigation, planning, integration, operator interaction within search and rescue robot systems

enabling DHS to provide guidance to local/state/federal homeland security entities regarding purchase, deployment, and use of these emerging tools

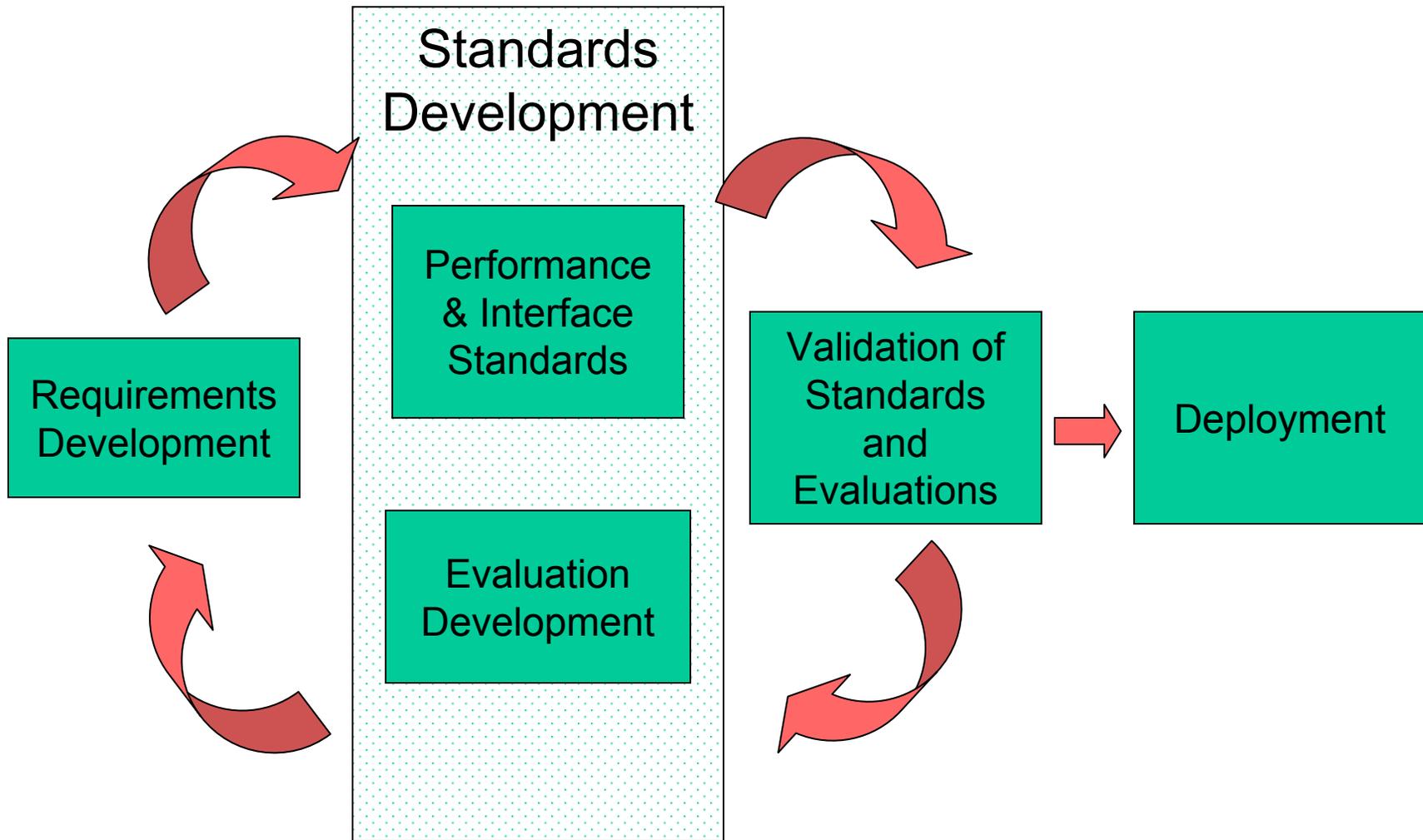
How Will the Standard Test Methods Be Used?

- DHS will provide guidance for procurement and use of robots by agencies at all levels
- Robots to be evaluated through standard test methods by certified sites
- Consumer's Reports types of results
- Compendium of robot capabilities by vendor (by third party)
- Performance requirements will educate responders, motivate developers

DHS/NIST US&R Robots Performance Standards Program



Overall Process



Requirements Development

- Workshops, outreach to emergency responders, robot vendors, researchers, federal agencies, state/local organizations
- Generate list of requirements and prioritize
- Validate progress in standardization and evaluation
- First set of requirements defined by responders through initial set of workshops November, December, and February
- Refine and update requirements throughout program

Standard Test Methods Development

- Based on input from community
- Performance and interface standard test methods
- Develop taxonomy of robot capabilities versus collapse/disaster
- Develop evaluation/testing methods to measure performance as well as interface standards conformance
- Identify candidate SDO's early in cycle
- Leverage existing work on other robot standards

Validation of Standard Test Methods

- Based on input from stakeholders
- Validation of evaluation/testing methods and interface standards conformance through experiments
- Frequent opportunities to view and critique test methods
- Testing of robots and components in realistic, instrumented facilities

Deployment

- Technology Readiness Level Assessment Exercises in representative environments
- Development of new Standard Operating Procedures
- Development of Training Programs
- Process for certifying independent testing organizations

Measures of Success

- Mid-term
 - Successful demonstrations by emergency response teams using robots
 - Quantifiable yearly improvements in performance of mobile robots within relevant environments
 - Annual surveys of first responders
 - Publication of standards and adoption by DHS
- Ultimate
 - Certification of site(s) to perform evaluations per standards
 - Fielding of effective US&R robots per standards
 - Increasing survival of victims and responders

Our Meeting Today

- Introduce solution providers and wider response community to overall program and initial set of performance requirements
- Provide opportunities to augment requirements set
- Gather input on candidate technologies available for Wave 1 evaluation
- Start forming community and standards committee that will collaborate on successful, fielded US&R robots

Near-Term Events

- NIST Special Publication of Requirements
- Visits to candidate certification/test sites
- “Responders meet Technology” event in August
 - Test drive and influence candidate solutions
 - Dry run Wave 1 performance tests
- First meeting of Standards Development Committee

Coming Events

- Urban Search and Rescue Performance Measures for Intelligent Systems Workshop - February 12, 2006
 - International Joint Topical Meeting: Sharing Solutions for Emergencies and Hazardous Environments (www.2006sharingsolutions.com)
- Joint IEEE Safety, Security, and Rescue Robots and Performance Metrics for Intelligent Systems Conferences - August 21-25, 2006

Stay in Touch

http://www.isd.mel.nist.gov/US&R_Robot_Standards/

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