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Standard Terminology for Urban Search and Rescue Robotic Operations[1]

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1. Scope

1.1 This terminology covers terms associated with Urban Search and Rescue (US&R) Robotics. By providing a common and consistent lexicon, the purpose of this document is to facilitate communication between individuals who may be involved in the research, design, and deployment of robots for US&R operations.

1.2 In order for the standard to be harmonious with the practices in the field, definitions have been drawn from the literature or other public sources when possible. When no definition is available, or definitions are in dispute, a consensus-based approach will be employed to resolve definitions and add them to the lexicon. The development of this standard is taking place in close coordination with the corresponding efforts in E54.08 and E54.92 to ensure comprehensive and consistent coverage.

2. Terminology

2.1 *Definitions:*

cache, *n*—stock of tools, equipment, and supplies stored in a designated location.

DISCUSSION—Organizations may standardize the items on the cache lists and the availability of the items. See Ref (1).[2]

collapse hazard zone, *n*—area established by the responsible official for the purpose of controlling all access to an area that could be impacted or affected by building collapse, falling debris, or other associated types of hazards including electrical, chemical, water, and aftershocks.

DISCUSSION—The area could contain a building or multiple structures, above ground or underground. A collapse hazard zone can also be established when an occurrence of such disasters is deemed highly probable or when a building is determined to be structurally unsustainable. See Ref (1).

emergency response team (ERT), *n*—team assembled by the involved organization in response to the occurrence of a disaster.

DISCUSSION—The composition, size, and capability of the team may vary based on the nature and size of the disaster. See Ref (1).

mission planning, *v*—process used to generate tactical goals, routes, tasks, commanding structures, coordination, and timing.

DISCUSSION—The mission plans can be generated either in advance or in real-time, can be generated either by an operator on an operator control unit or by the onboard software systems in either centralized or distributed ways. The mission plans can be general or specific and can be for a single robot or for teams of them. See Ref (2).

remote control, *v*—controlling a distant robot on a continuous basis using only direct observation. See Ref (3).

robot, *n*—mechanical system designed to be able to control its sensing and acting for the purpose of achieving goals in the physical world.

teleoperation, *v*—controlling a distant robot on a continuous basis and being provided with sensory or control information, or both, through means other than direct observation. See Ref (3).

world model, *n*—robot's internal representation of the world it is aware of, consisting of the parts of the environment that are of interest to the robot and the operator.

DISCUSSION—The world model may include entities—including the robot itself, objects in the environment, maps, and images. The individual representations may be complete or incomplete and may be associated with various levels of confidence. The world model may also contain information on how these individual elements might be related and how they might form certain situations given certain conditions and, thus, affect robotic operations in particular ways. See Albus et al. (4).

[1] This terminology is under the jurisdiction of ASTM Committee E54 on Homeland Security Applications and is the direct responsibility of Subcommittee E54.08 on Operational Equipment.

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[2] The boldface numbers in parentheses refer to a list of references at the end of this standard.