

RELATED TERMS

- Personnel Accountability
- Search and Rescue



Lessons Learned Information Sharing

www.LLIS.gov

PRIMARY DISCIPLINES

- Fire
- Hazardous Materials
- Emergency Management
- EMS

BEST PRACTICE

Incident Site Safety Planning: Rescue Operations

PURPOSE

Identifies pre-planning initiatives for developing and improving rescue operations at emergency incident sites.

SUMMARY

Response organizations should prepare for the rescue of lost, trapped, disoriented, and/or injured responders through the pre-incident planning of rescue operations. Rescue operations planning involves the pre-incident dedication of both personnel and resources to the rescue function.

DESCRIPTION

Response organizations need to plan for the rescue of lost or incapacitated personnel due to the unpredictable nature of emergency response. Many organizations incorporate a "rescue component" in their deployment models. In general, the rescue component consists of a team of responders dedicated solely, or in part, to the rescue function. Organizations must complete certain pre-planning steps in order to properly develop, deploy, and manage their rescue component.

This Best Practice reviews the need for rescue operations preparation and discusses processes response organizations can implement to foster a responder rescue capability. The Best Practice details:

- The need for rescue operations planning;
- Rescue operations standard operating procedure;
- Rescue operations training; and
- Rescue operations equipment.

Response organizations use different designations when referring to their rescue component. Some include:

- Firefighter assist and search team (FAST)
- On-deck crew
- Rapid intervention crew (RIC)
- Rapid intervention team (RIT)
- Standby team

Many response organizations use the term "rapid intervention" to describe their responder rescue process. Rapid intervention signifies that a team(s) of individuals is staged and ready to rapidly intervene in the event of a mayday situation. It does not denote that the rescue process will be inherently easy, rapid, or successful.

This Best Practice does not address incident site procedures that mitigate intervention or "mayday" situations. Emergency response organizations should take proactive measures to avoid mayday events. This is accomplished via pre-incident planning, responder training, and incident site discipline. For information on initiatives organizations can use to reduce

the occurrence of incident site maydays, see the *Lessons Learned Information Sharing Best Practice* document “Incident Site Safety Planning: Deployment.”

Need for Rescue Operations Planning

Developments in the emergency response community have reinforced the need for rescue operations preparation. Notable changes include:

- Fire personnel generally have less incident site experience than their predecessors due to a declining number of structure fires;
- An increasing number of structures are constructed with lightweight building materials that make them less resistant to fire and more susceptible to rapid collapse;
- Live fire training is relied upon less by the fire and emergency medical services (EMS) community due to environmental, safety, and cost considerations; and
- Improvements in personal protective equipment allow responders to advance farther into burning or contaminated structures, thereby increasing the likelihood responders will get lost or trapped in a building collapse or other mayday type event.

Standards

The need for rescue operations planning is reflected in and mandated by several national standards. National Fire Protection Association (NFPA) 1500, *Standard on Fire Department Occupational Safety and Health Program*, NFPA 1561, *Standard on Emergency Services Incident Management System*, and Occupational Safety and Health Administration (OSHA) Respiratory Protection Standard [29 CFR 1910.134\(g\)\(4\)](#) (often referred to as the “Two-in/Two-out rule”) all require that teams of at least two persons be available for the rescue of responders operating in hazardous environments.

Requirements for a rescue component are also addressed in NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* and NFPA 1720, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Volunteer Fire Departments*. NFPA 1710 recommends that a two-man crew (referred to as the “initial rapid intervention team” (IRIC)) be assigned to the rescue function immediately following the arrival of the first on-scene unit. In addition, NFPA 1710 suggests that a team of four “fully equipped and trained” individuals be dedicated to the rescue function within eight minutes of an incident’s first-arriving unit.

Lessons Learned

Lessons learned from previous rescue operations, as well as training exercises, further illustrate the importance of rescue operations planning. Lessons learned reveal the following about rescue operations:

- **Multiple teams:** On average, it takes three teams of responders (or 12 individuals) to locate, treat, and extract one mayday victim.
- **Collateral maydays:** Those involved in responder rescue are prone to become victims themselves

A total of 18 responders were involved in the attempted rescue and recovery of Bret Tarver, a Phoenix, AZ firefighter, during the 2001 Southwest Supermarket Fire. In addition to Tarver, a number of those engaged in the rescue efforts signaled maydays, as well. For more on rescue operations during the Southwest Supermarket Fire, see the Phoenix Fire Department’s [Final Report](#).

Four of the six firefighters who died during the [December 1999 Worcester, MA cold-storage warehouse](#) were lost while involved with rescue operations.

- due to the environment in which rescue operations take place.
- **Mayday communication:** Responders are reluctant to ask for help and often signal maydays only as a last option, well after they are in danger.

A 2001 exercise conducted by the [Phoenix, AZ Fire Department](#) found that one in five members assigned to the rescue component will get into “trouble” during rescue operations. A 2005 training evolution in Palm Beach County, FL yielded similar results, as several firefighters engaged with rescue operations did not adequately monitor their air supply and either became victims themselves or had to retreat without completing their rescue objectives.

Creating Rescue Operations Standard Operating Procedures

A response organization’s rescue operations capability is predicated on the development of SOPs. Rescue operations SOPs should provide a standardized framework for how an organization’s rescue component functions. SOPs should also provide the Incident Commander (IC) with a system to direct and deploy the rescue component during a mayday event. Although details of an organization’s rescue operations SOPs are unique, each should address:

- The purpose and scope of rescue operations;
- Staffing requirements;
- Equipment requirements;
- Individuals’ responsibilities during the rescue process, including pre-deployment, deployment, and post-deployment procedures;
- The termination of rescue operations; and
- Incident documentation for post-incident analysis.

Tactical Models

An organization’s SOPs should specify how the rescue component will be dispatched, positioned, tasked, and deployed at an incident site. Although no consensus on the subject exists, two tactical models are of note: The dedicated resource model and resource layering model.

Dedicated Resource Model. Many organizations dedicate one or several teams of individuals to the rescue function during an emergency response. These teams, often referred to as RITs, RICs, GO teams, or FASTs, are dispatched and assigned specifically to act as the rescue component. The team(s) positions themselves on the exterior of an incident’s hazardous area. In the event of a mayday situation, the team(s) is dispatched into the hazardous area and is responsible for locating and providing assistance to lost, trapped, or disoriented responders. Dedicated teams are also tasked with proactive pre-mayday assignments, such as incident site size-up, equipment staging, and the monitoring of communications channels.

SOPs from organizations that use the dedicated resources model can be found on-line. Many of those SOPs, along with a wealth of literature on the management and use of dedicated rescue teams, can be accessed on the non-for-profit website www.rapidintervention.com.

[Ankeny, IA Fire Department](#) includes a [RIT Checklist](#) in their rapid intervention SOPs. The checklist provides an orderly, step-by-step guide of what actions rescue crews should take at an incident site. It also contains a list of the tools needed to support the rescue function.

Resource Layering Model. Resource layering places teams of responders in a forward, “on-deck” position located near, but outside an incident site’s hazard zone. During a

mayday event, these on-deck teams can be used in several different capacities depending on their proximity to the mayday victim(s). For instance, an on-deck team may be assigned as the rescue component. Alternatively, on-deck teams can assist indirectly by completing other tactical objectives vital to the success of rescue operations. As one on-deck team is assigned and deployed, another team replaces them as the next on-deck team.

[Phoenix, AZ Fire Department](#) and their automatic aid partners have adopted and included the on-deck deployment model in their [SOPs](#). For additional information on resource layering and the use of an on-deck component, see the December 2004 *Fire Rescue Magazine* article "All Decked Out."

SOP Standardization

Mutual/automatic aid partners should collaborate to develop and adopt similar rescue operation SOPs. This promotes consistency during rescue operations and ensures that an area's rescue components use a common terminology, operate with interoperable equipment, and are trained/equipped to follow the same procedures. Several areas have accomplished standardization via county-wide or region-wide recommended operation guidelines (ROGs).

[Burlington County, NJ](#) developed an area-wide [rapid intervention ROG](#) in 1998. Area organizations can adopt or model their own SOPs after the ROG.

Rescue Operations Training

Response organizations must train their personnel to execute potential incident site rescue operations. This includes the development of a general rescue operations training program, as well as specific training for command officers and training exercises with neighboring jurisdictions.

Universal Training

Past incidents show that a mayday event's initial rescue team will consist of those responders in closest proximity to the mayday victim. In many instances, this will be the victim's own crew. Accordingly, experts agree it is important that all individuals likely to be involved in life-saving measures during an emergency response receive rescue operations training.

Training Programs

Organizations should develop and implement training programs that teach their personnel the fundamentals of rescue operations. Organizations may find it useful to employ both classroom and operational methodologies during rescue operation training.

Classroom Training. Classroom training should provide responders with background knowledge regarding responder rescue and its current applications. Classroom time may be devoted to:

- The history of and need for rescue operations;
- Statistics on responders' death and injury;
- A review of responder fatality case studies;
- The use of rescue equipment and general incident site responsibilities;
- Rescue operations SOPs; and
- A review of regional rescue operations guidelines (if applicable).

A February 1995 Pittsburgh, PA house fire that resulted in three line of duty deaths can act as a powerful illustration of the need for rescue operation preparedness, even during seemingly routine incidents, as detailed in a [USFA investigation of the fire](#).

Organizations may find it beneficial to employ an interactive approach when conducting classroom training. For example, trainers can display visuals depicting a mayday environment and engage in a give-and-take regarding what actions to execute in such a situation. Using timed conditions can make the exercise more authentic and stimulating. The utilization of audio, video, equipment demonstrations, and breakout groups are also recommended.

Operational Training. Operational training should build on classroom training and address rescue specific skills and scenarios in a hands-on environment. To enhance the effectiveness of training, many organizations use vacant buildings acquired for training purposes and build props that test basic rescue maneuvers and mimic oft-encountered obstacles. Props range from easy to construct [disentanglement simulators](#), to more substantial [training towers](#). Organizations should identify what training resources exist in their area before constructing elaborate and costly training props.

Organizations should consider simulating realistic conditions during operational training. Integrating heat, noise, smoke, and other incident site “stressors” into training evolutions affords trainees a greater understanding of actual mayday conditions. Many organizations also limit trainees’ visibility by placing wax paper over their self-contained breathing apparatus (SCBA) masks during training sessions.

[Tempe, AZ Fire Department](#) integrates distractions such as running chain saws, activated personal alert safety system (PASS) alarms, and radio feedback into rescue training exercises. This forces trainees to communicate and operate in non-traditional ways, thus preparing them for actual rescue operations.

Modular Approach. Some organizations may find it advantageous to utilize a modular approach when conducting rescue operations training. A modular approach allows organizations to break rescue training into small segments, each with different levels of difficulty. Using modules enables trainers to teach basic rescue concepts first, before moving on to more advanced rescue techniques. With the inclusion of knowledge and skill tests, it also ensures that responders become proficient in certain aspects of rescue operations before they are cleared for rescue activities.

According to experts, self-rescue and survival techniques should comprise the initial training modules. United States Fire Administration Technical Report 123, [Rapid Intervention Teams and How to Avoid Needing Them](#), suggests that organizations address the following topics in later training modules:

- Accountability;
- Building construction;
- Changeover procedures;
- Fire behavior and travel;
- Forcible exit techniques;
- Incident site communications;
- Incident size up methods;
- Ladder bail out techniques;
- Methods of victim removal;
- Team search techniques;
- Use of thermal imaging camera (TIC); and
- Various rescue scenarios, including entanglement, floor collapse, confined space, above ground, ground level, and below ground situations.

Training Resources. There are a number of programs and instructors available nationwide that can aid organizations in the creation of their own rescue training programs. A partial list of available instructors can be found at the not-for-profit website www.rapidintervention.com. It should be noted, however, that no official certification for response operations currently exists.

Command Training

Response organizations should prepare their command officers for rescue operations by providing command training. Command training should afford officers knowledge on how to deploy and manage rescue components during a mayday situation. Officers commanding rescue operations must be able to perform the following actions in a timely manner during a mayday event:

- **Summon and place additional resources:** Command officers must summon and position the appropriate resources so they can assign and deploy successive rescue teams during a mayday.
- **Modify plans:** Command officers must continually assess incident site conditions and modify operational plans when the existing plan begins to falter or fail.
- **Commence/halt operations:** Command officers must be able to sense when and when not to deploy rescue teams. They should also conduct periodic risk-benefit analyses and discontinue rescue efforts when conditions dictate.

Response organizations should refer to Appendix D of the National Fire Academy applied research project [*Expansion of the Incident Command System in a "Mayday" Situation*](#). Appendix D provides training guidelines that can be used to prepare ICs for rescue component deployment and management.

Interdepartmental Training

Response organizations should consider conducting interdepartmental training sessions with automatic/mutual-aid partners. Interdepartmental training allows neighboring organizations to become familiar with each others' equipment, most notably SCBA and PASS. It also allows the pre-event identification of any communication problems that exist between different agencies.

Interdepartmental training has the additional benefit of affording command officers experience with multi-crew rescue operations. A general knowledge of how to expand rescue operations improves command officers' ability to make strategic and operation level decisions during incidents.

Rescue Operations Equipment

Response organizations must acquire and dedicate a variety of tools to their rescue component. Experts suggest that the following equipment be made available to those performing the rescue function:

- Emergency rescue packs, including an extra SCBA complete with harness, regulator, and extra masks;
- Forcible entry hand tools such as axe, sledge, halligan bar, and bolt cutters;
- High intensity handlight;
- Ladder complement;
- Mechanical forcible entry tools, such as a chain saw, a metal cutting saw, and a masonry cutting saw;
- Portable radio;
- Search rope;

- Tarp or salvage cover; and
- TICs.

The Galen Cole Family Foundation launched its “Thermal Imaging Camera Program” in 1997. The program provides financial assistance to Maine fire departments seeking to purchase TICs. During the past eight years, the Cole Foundation has supported 214 Maine fire departments in purchasing 252 TICs, a contribution worth more than \$3,000,000. For more information on this innovative program, please refer to the *Lessons Learned Information Sharing Good Story*, “The Galen Cole Family Foundation of Maine’s Thermal Imaging Camera Program.”

Thermal Imaging Cameras

A February 2005 fire in [Fort Meyer, FL](#) and October 2004 fire in [Yakima, WA](#) demonstrated the wide variety of ways in which TICs can support rescue operations. TICs can help identify:

- Conditions that affect structural integrity;
- Hazardous materials;
- Missing or injured personnel; and
- The location and extent of fire conditions.

Due to the technical nature of TIC maintenance, training, and operation, many organizations have created TIC specific [SOPs](#) and [training programs](#).

Lessons learned from rescue operations training have shown that those involved with responder rescue should travel as light as possible in order to accomplish their rescue objectives. For that reason, it is important to note that the aforementioned list of equipment represents those tools that should be made available to rescue personnel, not necessarily used by them. Incident specific circumstances will dictate what, if any of those tools, should be carried and used during a mayday event.

Equipment Staging

Staging rescue equipment at an incident site is a good practice that improves the timeliness of rescue operations. Consequently, response organizations should have procedures for establishing and maintaining a rescue equipment pool near the incident scene. A strategically placed equipment pool will increase the likelihood of a successful rescue operation.

Some organizations may find it useful to incorporate a series of levels into their rescue equipment staging protocols. Pre-planned levels prevent personnel from staging excess equipment at any given incident. For more on the concept of rescue equipment staging, see Firehouse.com magazine article, [“Rapid Intervention Team Staging and Task Force Operations.”](#)

The [Lewisville, TX Fire Department](#)

provides its rescue teams with a large, bright yellow salvage cover for the staging of rescue equipment at incident sites. The salvage cover has “RIT” written on each corner, along with a list of tools rescue team members should assemble. This system discourages other on-scene personnel from taking tools designated for rescue operation purposes, helps prevent the loss of tools at an incident site, and identifies those members performing the rescue function.

Identification Equipment

Emergency planners may find it useful to provide members dedicated to the rescue function with equipment intended for identification purposes. This can include helmets, vests, or decals that delineate those involved with the rescue component from other on-site personnel. Differentiating rescue component members enables the IC and other incident site officers to know the location and status of active rescue crews.

Equipment Deployment

Organizations should have a pre-planned mechanism to gather and move rescue equipment at an incident scene. A properly sized bag or box can save responders time and facilitate

the movement of rescue equipment from emergency apparatuses to designated staging areas.

Equipment Vendors

Many manufactures sell pre-assembled kits that can assist in the purchase of rescue equipment. A partial list of vendors can be found at the not-for-profit website www.rapidintervention.com.

RESOURCES

Standards and Regulations

NFPA 1500 Standard on Fire Department Occupational Safety and Health Program

- Details health and safety standards for fire companies, including requirements for protective clothing and equipment, emergency operations, and medical and physical requirements.
- Section 8.5

NFPA 1561 Standard on Fire Department Emergency Management Systems

- Provides broad guidelines based on ICS concepts for what should be included in any emergency management system; the appendix gives examples of successful systems currently in use.
- Section 4.1

NFPA 1710 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments

- Contains minimum requirements relating to the organization and deployment of fire suppression, emergency medical operations, and special operations to the public by substantially all career fire departments.
- Section 5.2

NFPA 1720 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Volunteer Fire Departments

- Contains minimum requirements relating to the organization and deployment of fire suppression resources: and for those fire departments which provide them, emergency medical and special operations resources.
- Section 3.3

OSHA 29 CFR 1910.120 Standard on Hazardous Waste Operations and Emergency Response, section (q) (3)

- *“Back-up personnel shall be standing by with equipment ready to provide assistance or rescue. Qualified basic life support personnel, as a minimum, shall also be standing by with medical equipment and transportation capability.”*

OSHA 29 CFR 1910.134 Standard on Respiratory Protection, section (g)

- *“A minimum of two (2) firefighters, fully equipped and trained SHALL be on standby outside the structure to provide assistance or perform rapid rescue, if needed. Voice, visual, or radio contact is required between the interior and exterior teams at all times. One of the exterior team members must be free of all other tasks in order to account for, and if necessary, initiate a rescue of those firefighters inside. While the second exterior team member may perform some other tasks, this individual must*

be able to abandon them without jeopardizing the safety and health of others at the scene."

References

- Abbott, Paul. "ABBET-RIT (Allegheny, Beaver, Butler Emergency Teams-Rapid Intervention Teams)," Rapidintervention.com. Jun 2002.
http://www.rapidintervention.com/media/featured_rit_team/june2002/
- Baird, Jim. "RIT Command Procedures (The First Fifteen Minutes)," Rapidintervention.com. Jun 2003.
http://www.rapidintervention.com/media/monthly_training_topic/june2003/
- Brunacini, Alan and Nick Brunacini. *Command Safety*. Across the Street Productions. 2004.
- Buttlar, Chris. "South Hills Regional Go-Team (SHRGT)," Rapidintervention.com. Feb 2005.
http://www.rapidintervention.com/media/featured_rit_team/
- Campbell, Colin. "NIOSH Releases Worcester Warehouse Fire Investigation Summary," Firechief.com. 01 Nov 2000.
http://firechief.com/mag/firefighting_niosh_releases_worcester/index.html
- Cline, Doug. "Dis-entanglement Simulators (Why do we need them and how to build one)," Rapidintervention.com. Mar 2003.
http://www.rapidintervention.com/media/monthly_training_topic/march2003/
- Crawford, James K. "A Rapid Intervention Commentary: "Do You Walk the Walk or Talk the Talk?" Rapidintervention.com. Feb 2003.
http://www.rapidintervention.com/media/monthly_training_topic/february2003/
- Crawford, James K. "Firefighter Rescue: A Responsibility or Disease? A Rapid Intervention Commentary," Rapidintervention.com. Jul 2003
http://www.rapidintervention.com/media/monthly_training_topic/july-august2003/
- Crawford, James K. "Rapid Intervention Team Staging and Task Force Operations," Firehouse.com. Jun 2004.
<http://cms.firehouse.com/content/article/article.jsp?sectionId=10&id=6174>
- Crawford, James K. "Rapid Intervention Training: Moving an Unconscious Firefighter Across a Horizontal Surface," Firehouse.com. Apr 2004.
<http://cms.firehouse.com/content/magazine/article.jsp?id=802>
- Crawford, James K. "RIT/FAST: The Rule of Three," Rapidintervention.com. Jan 2004.
http://www.rapidintervention.com/media/monthly_training_topic/january2004/
- FireEngineering.com. *Rapid Intervention Teams*, Roundtable Discussion. Jun 2004.
http://fe.pennnet.com/Articles/Article_Display.cfm?Section=Archi&Subsection=Display&P=25&ARTICLE_ID=209129&KEYWORD=RIT
- Hinton, John. "All Decked Out," *FireRescue Magazine*. Dec 2004, pp. 51-55.
- Hinton, John. "Rapid Improvement," *FireRescue Magazine*. Aug 2005, pp. 56-62.
- Kreis, Steve. "Rapid Intervention Isn't Rapid," FireTimes.com. May 2003.
<http://www.firetimes.com/story.asp?FragID=8399>
- Lamb, Peter. "The Rapid Intervention Time Line and Crew Survivability," FireEngineering.com. Aug 2002.
http://fe.pennnet.com/Articles/Article_Display.cfm?Section=Archi&Subsection=Display&P=25&ARTICLE_ID=154438&KEYWORD=RIT

Lasky, Rick. "Rapid Intervention: Keeping Your Tools Together," FireEngineering.com. Aug 2002.
http://fe.pennnet.com/Articles/Article_Display.cfm?Section=Archi&Subsection=Display&P=25&ARTICLE_ID=154461&KEYWORD=RIT

Loeber, John Sr. "Fireground Safety," Fire Department Safety Officer Association. Oct 2000.
<http://www.fdsoa.org/news/news3.html>

McCormack, Jim. "Rapid Intervention: Are We Really Prepared?" Firehouse.com. Jun 2004.
<http://cms.firehouse.com/content/article/article.jsp?sectionsId=10&id=6953>

McCormack, Jim. "Rapid Intervention-Emergency Air Supply," Firehouse.com. Jun 2004.
<http://cms.firehouse.com/content/article/article.jsp?sectionId=10&id=3687>

McCormack, Jim. "Searching for a Firefighter," Firehouse.com. Jun 2004.
<http://cms.firehouse.com/content/article/article.jsp?sectionId=10&id=11170>

McNamee, Michael. "The Rapid Intervention Dilemma," Fire Department Safety Officer Association. Oct 2003.
https://www.llis.dhs.gov/member/secure/detail.cfm?content_id=13324

Mora, William. "No More Maydays," Firechief.com. Aug 2003.
http://firechief.com/tactics/firefighting_no_maydays/index.html

Pease, David. "Tomorrow's Technology for Today's Searches," *Advanced Research Technology*. Jan 2004.
<http://www.advancedrt.com/articles/rtarticles/thermal.html>

Pendley, Tom. "Managing a Lost Firefighter Incident," *FireRescue Magazine*. Feb 2003.
<http://www.jems.com/firerescue/exclus03/e0211h.html>

Phoenix Fire Department. *Phoenix Regional Standard Operating Procedures: Volume 2*.
http://phoenix.gov/FIRE/start_here.html

Phoenix Fire Department. *Southwest Supermarket Fire: Final Report*. 12 Mar 2002.
https://www.llis.dhs.gov/member/secure/detail.cfm?content_id=13596

Ray, Shane. *Expansion of the Incident Command System in a "Mayday" Situation: Executive Analysis of Fire Service Operations in Emergency Management*. Sept 2003.
https://www.llis.dhs.gov/member/secure/detail.cfm?content_id=13572

Richardson, Michael T. "Thermal Triage," Firechief.com. Sep 2001.
http://firechief.com/mag/firefighting_thermal_triage/index.html

Roberston, Michael. "The RIT Bag," FireEngineering.com. Apr 2004.
http://fe.pennnet.com/Articles/Article_Display.cfm?Section=Archi&Subsection=Display&P=25&ARTICLE_ID=205682&KEYWORD=RIT

Robertson, Michael. "Safety in Numbers," Firechief.com. May 2000.
http://firechief.com/mag/firefighting_safety_numbers/

Salka, John. "Rapid Intervention Teams: Safety Team Tactics," Firehouse.com. Jun 2004.
<http://cms.firehouse.com/content/article/article.jsp?sectionId=14&id=122>

Sendelbach, Timothy. "Managing the Fireground Mayday: The Critical Link to Firefighter Survival," Firehouse.com. Jun 2004.
<http://cms.firehouse.com/content/article/article.jsp?sectionId=10&id=10287>

Sendelbach, Timothy. "S.C.B.A. Confidence for Fireground Survival," Rapidintervention.com. May 2003.
http://www.rapidintervention.com/media/monthly_training_topic/may2003/

Sheppard, Vicki. "RIT Evolutions in Hotel Provide Valuable Training Lessons," FireEngineering.com. Feb 2005.
http://fe.pennnet.com/articles/article_display.cfm?section=Display&ARTICLE_ID=221280

Smith, Mike. "Commanding a RIT Operation." Rapidintervention.com. Jul 2002.
http://www.rapidintervention.com/media/monthly_training_topic/july2002/

Sohdya, Nick. "Removing a Fire Fighter from a Tight Space with a High Windowsill," Rapidintervention.com. May 2002.
http://www.rapidintervention.com/media/monthly_training_topic/may2002/

Sohyda, Nick. "Evaluating Your Department's Rapid Intervention Program," Rapidintervention.com. Aug 2004.
http://www.rapidintervention.com/media/monthly_training_topic/august2004/

Stambaugh, Hollis and James Williams. *Rapid Intervention Teams*, Technical Report Series. United States Fire Administration. Mar 2003.
https://www.llis.dhs.gov/member/secure/detail.cfm?content_id=13570

Swanick, James T. "Firefighter Assistance and Search Teams in Volunteer Departments," FireEngineering.com. Dec 2002.
http://fe.pennnet.com/Articles/Article_Display.cfm?Section=Archi&Subsection=Display&P=25&ARTICLE_ID=167877&KEYWORD=RIT

Terriaco, Ron. "Basic RIT Tools on the Apparatus," FireEngineering.com. Dec 2004.
http://fe.pennnet.com/Articles/Article_Display.cfm?Section=Curri&Subsection=Display&P=25&ARTICLE_ID=221348&KEYWORD=RIT

Titan Systems Corporation. *Arlington County After-Action Report on the Response to the September 11 Terrorist Attack on the Pentagon*. 30 May 2002.
https://www.llis.dhs.gov/member/secure/detail.cfm?content_id=483

Titan Systems Corporation. *Rhode Island: The Station Club Fire After-Action Report: State, Local, and Federal Government and the Private Sector*. Jul 2004.
https://www.llis.dhs.gov/member/secure/detail.cfm?content_id=10806

United States Fire Administration. *Abandoned Cold Storage Warehouse Multi-Firefighter Fatality Fire*, Technical Report Series. Dec 1999
https://www.llis.dhs.gov/member/secure/detail.cfm?content_id=13593

United States Fire Administration. *Three Firefighters Die in Pittsburgh House Fire*, Technical Report Series. Feb 1995.
https://www.llis.dhs.gov/member/secure/detail.cfm?content_id=13595

DISCLAIMER

Lessons Learned Information Sharing (LLIS.gov) is the US Department of Homeland Security/Federal Emergency Management Agency's national online network of lessons learned, best practices, and innovative ideas for the emergency response and homeland security communities. The Web site and its contents are provided for informational purposes only, without warranty or guarantee of any kind, and do not represent the official positions of the US Department of Homeland Security. For more information on *LLIS.gov*, please email Feedback@llis.dhs.gov or visit www.llis.gov.

