DEVELOPING A STANDARD OPERATING GUIDELINE FOR RAPID INTERVENTION TEAM OPERATIONS FOR THE DELTONA FIRE DEPARTMENT

EXECUTIVE DEVELOPMENT

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ABSTRACT

The problem was the Deltona Fire Department (DFD) did not have a standard operating guideline (SOG) for rapid intervention team (RIT) operations. The purpose was to develop a SOG on RIT operations. This was an action based applied research project. The research questions were:

1. What State of Florida regulations and national standards exist in reference to a RIT?
2. When should a RIT be used?
3. What equipment is necessary for effective RIT operations?
4. What is the recommended staffing levels for an effective RIT?
5. What are the responsibilities of a RIT?
6. What training is necessary for an effective RIT?

The procedures involved a literature review, and telephone interviews with a state official and fire department leaders.

The results were that there was not any Florida regulations however, there were national standards that pertain to RIT operations. A RIT should be used whenever there is a crew of personnel working in a hazardous area and deployed whenever personnel have become lost, trapped, or injured. The equipment needed was forcible entry tools, rope, thermal imaging camera, stokes basket, emergency medical equipment, and a checklist. The responsibilities were to monitor communications and crew location, set up and deploy equipment, survey the fireground for hazards, and search for and rescue personnel. Interviews with fire department leaders confirmed information in the literature review and also provided personal insight into RIT operations.
Staffing levels were two to four personnel per team, with a minimum of one team, and more if an incident grew. The training needed to be systematic, comprehensive and realistic, include RIT skills and tactics, and to develop positive attitudes.

The recommendation based on this research was to develop a SOG on RIT operations and to recommend that the DFD Training Division develop a training course on effective RIT operations.
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INTRODUCTION

Fire fighting is a hazardous profession. Rapid intervention teams are teams designed for the purpose of saving firefighter’s lives when they are lost, trapped or injured inside hazardous areas and atmospheres that are immediately dangerous to life or health (IDLH) such as those found in structure fires. Some agencies call their team a rapid intervention team (RIT), some are called a rapid intervention crew (RIC), and others are called a firefighter assist and search team (FAST). For the purpose of this paper these terms will be interchangeable. Whatever the name, having a team of firefighters prepared and equipped to rescue their own is an important safety feature needed on the fire ground. The problem is the Deltona Fire Department (DFD) does not have a standard operating guideline (SOG) for RIT operations. The purpose of this applied research paper is to develop a SOG on RIT operations. This is an action based applied research project. The research questions are:

1. What State of Florida regulations and national standards exist in reference to a RIT?
2. When should a RIT be used?
3. What equipment is necessary for effective RIT operations?
4. What is the recommended staffing levels for an effective RIT?
5. What are the responsibilities of a RIT?
6. What training is necessary for an effective RIT?

BACKGROUND AND SIGNIFICANCE

Fire departments around the world are continuously needed to respond into hazardous areas. The DFD is no different. Fires are some of the most hazardous incidents that departments are asked to respond to. They contain many hazardous areas. In the past the DFD has responded to these types of incidents, and although no Deltona firefighters have lost their life in the line of
duty, some have been injured on the fireground. In 1997, the DFD responded to 92 structure fires. Five firefighters were injured on those alarms (City of Deltona Fire-Rescue/Safety Department 1998). In 1998, the DFD responded to 80 structure fires and 16 firefighters were injured (City of Deltona Public Safety Department 1999). Last year, the department responded to 105 structure fires and eight firefighters were injured (City of Deltona Fire Department 2001). Nationally there were 94 firefighters that died in the line of duty in 1996. Thirty-eight of these deaths were at fire scenes. Eight of the deaths involved asphyxiation from carbon monoxide poisoning or inhalation of smoke or super heated gases during structural firefighting. The firefighters were caught and trapped by rapidly spreading fires or structural collapses (United States Fire Administration 1998).

Presently the DFD responds to structure fires. According to the United States Fire Administration, about 100 firefighters lose their life in the line of duty and 100,000 are injured annually (United States Fire Administration 1998). Deltona firefighters are not aware of procedures or equipment needed to skillfully rescue their fellow firefighters should the need arise. They have not been prepared for the chaos that often accompanies these operations nor for the emotions they will need to overcome to perform an effective rescue.

In the future, having a RIT on the scene has the potential of saving the lives and reducing the seriousness of injuries to firefighters working in hazardous areas. It could also improve the morale of the personnel knowing that there are firefighters outside ready to rescue them if something goes wrong. This will improve the quality of the organization.

This study becomes significant by providing an added measure of safety to Deltona firefighters on the fireground. It is directly related to Unit 10 of the Service Quality/Marketing section of the manual for the National Fire Academy's Executive Development course that reads
"Quality is conformance to standards" (Dr. W. Edwards Deming) (National Fire Academy 1998). Conformance with standards will improve the service quality of the organization and improve our reputation as a high service quality provider.

**LITERATURE REVIEW**

**What State of Florida regulations and national standards exist in reference to a RIT?**

Chapter 442 of the 2000 Florida State Statutes on Occupational Safety and Health gave the Division of Safety within the Florida Department of Labor and Employment Security (FDLES) the authority to adopt rules for the purpose of assuring safe working conditions for all workers. This division had adopted rules from the Occupational Safety and Health Administration (OSHA) 29CFR-1910.134 on *Respiratory Protection* and the National Fire Protection Association (NFPA) 1500 *Standard on Fire Department Occupational Safety and Health Program* which deal with rapid intervention crews and two-in and two-out requirements (Online Sunshine 2000). This researcher conducted a telephone interview with Doris Lee, an Administrative Assistant in the Division of Employment Security under Workers Compensation in the FDLES. Doris Lee was recommended by the FDLES, and was selected for interview, due to her knowledge of the responsibilities and history of the Division of Safety within the FDLES. To summarize this interview, Mrs. Lee advised that the Division of Safety had adopted rules pertaining to rapid intervention from OSHA and NFPA, but the Florida legislature repealed Chapter 442 of the Florida State Statutes on July 1, 2000 therefore abolishing the Division of Safety. This left no government agency within the State of Florida that required the use of a RIT, and she was unaware of any other Florida regulations pertaining to rapid intervention (D. Lee personal communication, June 27, 2001). This interview influenced this project by
providing information as to the lack of Florida regulations pertaining to rapid intervention, and helping to answer research question one.

On the national level, OSHA 29CFR-1910.134 is a national standard that has requirements for fire departments to provide for emergency rescue of their employees that are operating in IDLH atmospheres. This standard requires that personnel stand by outside an IDLH atmosphere ready for emergency rescue of employees working inside an IDLH atmosphere (Occupational Safety & Health Administration 1998). Another national standard is NFPA 1500. The standard requires personnel to stand by outside a hazardous atmosphere for emergency rescue of personnel inside (National Fire Protection Association 1997). Since the State of Florida or our fire department has not adopted NFPA 1500 as a standard, we have no obligation to follow this standard. The same can be said about OSHA 29CFR-1910.134. Since Florida is not an OSHA state we do not have to follow its standards. However, we have to recognize that these standards establish a "standard of care" which can make the DFD liable if a firefighter were injured or killed, and following these provisions could have prevented the death or minimized injuries (Coleman 2000, February).

When a RIT should be used?

OSHA and NFPA provide national standards for safety in the workplace. OSHA standard 29CFR-1910.134 requires members to be assembled outside of atmospheres that are immediately dangerous to life or health (IDLH) for the rescue of firefighting personnel. Section 29CFR-1910.134 paragraph (g) (3), includes procedures for IDLH atmospheres that requires for all IDLH atmospheres, the employer shall ensure one employee or, when needed, more than one employee is to be located outside the IDLH atmosphere. Section 29CFR-1910.134 paragraph (g) (4), includes procedures for interior structure firefighting, that require in addition to the
requirement set in 29CFR-1910.134 paragraph (g) (3), in interior structural fires, the employer shall ensure that at least two employees are located outside the IDLH atmosphere (Occupational Safety & Health Administration 1998). NFPA 1500 contains information as to when personnel should be assembled for standby at emergency incidents to rescue personnel if necessary. NFPA 1500 section 6-4 on members operation at emergency incidents requires that in the initial stages of an incident where only one team is operating in the hazardous area at a working structural fire, a minimum of four personnel is needed. It defines the “initial stages” of an incident to encompass the tasks undertaken by the first arriving company with only one team assigned or operating in the hazard area. Section 6-4 also requires that once a second team is assigned or operating in the hazardous area, the incident shall no longer be considered in the “initial stage,” and at least one rapid intervention crew (RIC) shall be necessary. NFPA 1500 section 6-5 on rapid intervention for rescue of members requires the fire department to provide personnel for the rescue of members operating at emergency incidents if the need should arise (National Fire Protection Association 1997). In some departments the team is assembled at all incidents where a 1 ½ inch or larger hose line is deployed and where self-contained breathing apparatus are used (Coleman 2000, July).

There are several reasons the mode of the rapid intervention team (RIT) can change from standby to deployment. Events such as flashover, backdraft, building collapse, or a fire fighter missing due to a personnel accountability system check can place a RIT into action. Most commonly it is due to a fire fighter becoming lost or disoriented in a building (Crawford 1999). In the Phoenix Fire Department, the term "mayday" declared over the radio would require their Rapid Intervention Crew (RIC) to be deployed. Reasons to issue a mayday would be by a member who is lost, trapped or in trouble. Other reasons would be by a company officer, sector
officer, or other member who cannot account for an assigned firefighter who is operating in the hazard zone. Another reason to issue a mayday would be by a member who witnesses or has confirmed that a firefighter is lost or in trouble (Phoenix Fire Department 1997).

**What equipment is necessary for effective RIT operations?**

OSHA standard 29CFR-1910.134 paragraph (g) (3) requires that employees be equipped with pressure demand or other positive pressure self contained breathing apparatus (SCBA), or a pressure demand or other positive pressure supplied respirator with auxiliary SCBA. It further requires appropriate retrieval equipment for removing employees who enter these hazardous atmospheres where retrieval equipment would contribute to the rescue of the employee(s) and would not increase the overall risk resulting from entry. Paragraph (d) (2) requires employees to be equipped with a full face piece pressure demand SCBA certified by the National Institute for Occupational Health and Safety (NIOSH) for a minimum service life of thirty minutes, or a combination full face piece pressure demand supplied air respirator with auxiliary self contained air supply (Occupational Safety & Health Administration 1998).

NFPA 1500 section 6-5 requires that rapid intervention crews shall be fully equipped with the appropriate protective clothing, protective equipment, SCBA, and any specialized rescue equipment that might be necessary given the specifics of the operation under way (National Fire Protection Association 1997).

Phoenix Fire Department has put together a RIC—SCBA kit that is required to be taken to the rescue area. The items included in this kit are 4 flashlights, 4 packstraps, 4 doorstraps, 4 sprinkler wedges, 4 life lines with deployment bags, 1 bolt cutter (small 12”), 1 channel lock (multi adjustable pliers 12”), 1 phillips head screwdriver (6”), 1 folding knife (3-4” blade), 1 wire cutter (snub nose pliers with side cutter 7-10”), 1 straight blade screwdriver (6”), 1 SCBA
bottle with supply pigtail, and 1 SCBA bottle (Phoenix Fire Department 1999). Miami-Dade Fire Rescue in Miami, Florida also has a similar type bag they call a RIT bag. Their bag includes a carabiner, crash axe, electricians wire cutters, flashlight, hacksaw, radio, rope (two 100 foot long search ropes – 8 mm in diameter), SCBA regulator assembly (minus harness), tin snips, and tubular webbing. Some of the other tools Miami-Dade’s RIT use that are not in the RIT bag are a SCBA cylinder, halligan tool, flathead axe, sledge hammer, hydraulic forcible entry tool, 24 foot extension ladder, charged hose line, air supply apparatus or line, K-12 with appropriate blades, Hurst tool, air bag, and an air chisel (Miami-Dade Fire Rescue 1999). In the Richardson Fire Department in Richardson, Texas they also use a thermal imaging camera when one is available (Richardson Fire Department 2000). Coeur d’Alene (ID) Fire Department requires their teams to bring an emergency medical service (EMS) bag and a defibrillator, stating that a large amount of line of duty deaths are cardiac related (Coleman 2000, July).

Another valuable tool is a RIT checklist. This would help remind and organize the team. The checklist should include four major topics with subtopics under each. The first topic would be size-up. Under this topic, the team should determine the building dimensions, building occupancy, building construction type, the location of windows, doors, fire escapes, porches, any high security doors, barred windows, or building modifications. The next topic would be tactics. For this topic, the team should consider the type of fire attack, monitor command operations, check the accountability system, monitor communication on the fire ground, communicate with the incident commander, monitor placement of ladders and truck operations, and monitor fireground time vs. progress. The next topic would be equipment. In this area, the team should have a list of equipment that could be needed based on the construction types. The final topic would list other operations of concern. These would include checking with the rehab officer on
condition of firefighters, check with the safety officer and compare information, relocate or add another RIT, monitor potential collapse and collapse areas, and ensure emergency medical services (EMS) are available (Kolomay & Hoff 1998).

What is the recommended staffing levels for an effective RIT?

OSHA standard 29CFR-1910.134 paragraph (g) (4) requires that at least two employees be located outside an IDLH atmosphere when a team of employees are working inside. NFPA 1500 paragraph 6-4 requires that members operating in hazardous areas at emergency incidents operate in teams of two or more. It further requires that in the initial stages of an incident where only one team is operating in the hazardous area at a structure fire a minimum of four individuals are required, two working in the hazardous area and two outside the hazardous area for assistance or rescue, if required. Paragraph 6-5 requires that a rapid intervention crew shall consist of at least two members. Beyond the requirement of two members, the composition and structure of rapid intervention crews shall be permitted to be flexible based on the type of incident and the size and complexity of operations. However, the incident commander shall evaluate the situation and the risks to operating teams and provide one or more rapid intervention crews commensurate with the needs of the situation (National Fire Protection Association 1997).

In the Columbia (SC) Fire Department in Columbia five personnel must be on scene of a structure fire before interior operations can begin: two to enter the structure, two to perform FAST duties, and a pump operator. Their FAST is initially established using only two firefighters but is increased to four as soon as possible. They use multiple FASTs at large incidents to cover personnel working in remote IDLH atmospheres or hazardous areas (Coleman 2000, July).
Captain Mike Morton with the Bryn Athyn (PA) Fire Company uses a five person FAST in a two-team concept. The first team consists of two personnel and will go in and locate the trapped or injured firefighter. The second team, consisting of an officer and two firefighters support the first team by bringing the equipment the first team calls for to efficiently perform the rescue (Morton 1999).

The Miami-Dade Fire Rescue Department staffs their RIT with three personnel, two firefighters and one officer (Miami-Dade Fire Rescue 1999). The Richardson Fire Department uses two personnel as an Initial Rapid Intervention Crew (IRIC). The IRIC is used in the initial stages of an incident and is upgraded to a full RIC that consists of four personnel as soon as possible (Richardson Fire Department 2000).

**What are the responsibilities of a Rapid Intervention Team?**

OSHA standard 29CFR-1910.134 paragraph (g) (3) requires that two outside personnel, standing by outside the IDLH atmosphere, be trained and equipped to provide effective rescue and maintain visual, voice, or signal line communication between the personnel inside and outside the IDLH atmosphere. This paragraph also requires at least two personnel to enter an IDLH atmosphere. Note 1 to paragraph (g) allows one of the two personnel outside the IDLH atmosphere to perform an additional role so long as this individual is able to perform assistance or rescue activities and abandoning the additional role does not jeopardize the safety or health of any firefighter working at the incident. Note 2 to paragraph (g) allows firefighters to perform emergency rescue activities before the entire team of four has been assembled (Occupational Safety & Health Administration 1998). NFPA 1500 paragraph 6-4 requires that members operating in hazardous areas at emergency incidents operate in teams of two or more. The standby members shall be responsible for maintaining a constant awareness of the number and
identity of members operating in the hazardous area, as well as their location, function and time of entry. The standby members shall remain in radio, visual, voice, or signal line communications with the team at all times. One standby member shall be permitted to perform other duties outside of the hazardous area provided constant communications is maintained between the standby member and the members of the team. However, no one shall be permitted to serve as a standby member of the firefighting team when the other activities in which they are engaged inhibit their ability to assist in or perform rescue, or are of such importance that they cannot be abandoned without placing other firefighters in danger. The initial stages of an incident shall encompass the tasks undertaken by the first arriving company with only one team assigned or operating in the hazardous area. Once a second team is assigned or operating in the hazardous area, the incident shall no longer be considered in the initial stage and at least one rapid intervention crew shall be required. Initial attack operations shall be organized to ensure that, if upon arrival at the emergency scene, initial attack personnel find an imminent life-threatening situation where immediate action could prevent the loss of life or serious injury, such action shall be permitted with less than four personnel. No exception shall be permitted when there is no possibility to save lives or prevent serious injury (National Fire Protection Association 1997).

In the Lisle-Woodridge Illinois Fire District a RIT will conduct reconnaissance of the scene to determine potential areas of response and preplan the likely tactics they may need to perform. The RIT will position itself at a point of vantage with the necessary equipment to perform the preplanned tactics. Conducting reconnaissance and positioning of the RIT is coordinated with its assigned officer, who will advise Command of the team's location and readiness status. The RIT officer closely monitors all radio traffic, as well as the location of all operating companies on the
fireground (Coleman 2000, July). In the Phoenix Fire Department, standard operating procedures require the RIC to monitor the tactical channel while en route to an incident and to initiate a tactical worksheet to log the locations of all operating companies. On arrival at the scene, the company officer will report to the incident commander for a briefing and final updating of the tactical worksheet and crew locations. The RIC continually monitors the tactical channel, and the worksheet is updated as needed (Phoenix Fire Department 1999).

In the Buffalo (NY) Fire Department in Buffalo the person in charge of the FAST and one other member circle the perimeter of the building and perform a size-up, focusing on possible danger areas. After the size-up is completed, unsafe conditions should be addressed where possible. The most common action taken is to have additional ground ladders put up to create emergency exits and assist truck crews with ventilation. Other actions include placing traffic cones around downed power lines, laying in but not advancing additional hose lines, administering first aid to fire victims, and assisting a line crew member who has lost his partner (Coleman 2000, July). The Toledo (OH) Department of Fire and Rescue assigns each member of the RIT a specific task. When the team is deployed this provides focus and coordination at a very emotional and confusing time. One member is the officer in charge. His task is to ensure that operations are being conducted as safely and with as much coordination as possible. One member concerns himself with approaching and assessing the downed firefighter. One member is assigned to check and ensure that the firefighter has a good air supply. The last firefighter (of the four-person crew) is a utility firefighter and remains with the officer. He will clear the paths of obstructions, may take out windows, may set up a rope lowering system, or may simply help to drag the downed firefighter to safety (Coleman 2000, July). RIT members must accomplish several tasks before entering the structure to search. First priority is to establish radio
communications with the firefighters in trouble. This should provide pertinent information about the situation, including location, type of injuries or level of consciousness, type and extent of entrapment, and the amount of air left in SCBAs. While the RIT leader is obtaining this information team members should be selecting and gathering their entry tools from the staging tarp. The initial entry team should select only basic forcible entry tools so as not to slow down the team during the search. If larger or specialized tools are needed after the size-up, a second team should enter with the equipment. In the case of a firefighter victim search, technology exists to assist a rapid intervention team.

The personal alert safety system (PASS) has given firefighters an edge in finding a firefighter in distress. We can now use our ears to hone in on the location of a trapped firefighter. Using a search rope we can go straight for the PASS, thus reducing search time. If a thermal imaging camera is being used an even quicker search time is achieved. As rescuers enter the fire building they would drop to their knees and maintain silence listening for a PASS device's audible signal and determine where it is coming from. This will determine the team's search pattern in the fire building. If a downed firefighter's PASS has not been activated rescuers must listen for calls for help, the striking of a tool, or radio transmissions.

An operations officer should be sent to the rescue area if there is entrapment to assume command of the interior. Team leaders should not commit all team members to the rescue room if they are not needed (Crawford 1999). The RIT must consider the critical function of the emergency air supply. In most instances, when a broadcast is made for lost or trapped firefighters, locating the firefighters and ensuring an adequate air supply are the most important functions the RIT can provide prior to getting them out (McMormack 2000). However, once a
true emergency exists on the fireground the RIT's task is clear, to remove the downed firefighter as quickly as possible (McLees 2000).

In the Richardson Fire Department, while en route to an incident, RIC teams monitor the tactical channel and initiate the use of a tactical work board, noting the location of operating companies. The tactical work board is continually updated. The RIC company officer obtains from the incident commander a detailed briefing on the status and location of all assigned companies. All RIC members assume a ready state, including full protective clothing and SCBA. The RIC company officer closely monitors the assigned tactical radio channel at all times. In some cases the RIC will conduct a reconnaissance of the incident scene to maintain awareness of the locations of working companies and their condition. The teams are able to react immediately to emergency events at the incident. In all cases, the RIC will have the ability to rapidly deploy. In some situations protective hose lines are pre-deployed and forcible entry is necessary. RIC will assess the need for other access points to provide egress, rescue, and ventilation. When companies are operating on floors above ground, the RIC will consider pre-positioning ground ladders to allow for emergency egress and rescue. Whenever a RIC is deployed, another RIC will be assigned as soon as possible. This will ensure further back up to the crews involved in a rescue operation. Upon a report of a lost or trapped firefighter, the incident commander deploys RIC to the last reported location of the lost or trapped firefighters. The RIC / SCBA rescue kit is taken in, as well as the thermal imaging camera if available (Richardson Fire Department 2000).

**What training is necessary for an effective RIT?**

OSHA 29CFR-1910.134 paragraph (g) (3) requires that employee(s) located outside of an IDLH atmosphere be trained and equipped to provide effective emergency rescue. OSHA
29CFR-1910.134 paragraph (k) requires the employer to provide effective training to employees who are required to use respirators. The training must be comprehensive, understandable, and recur annually, and more often if necessary (Occupational Safety & Health Administration 1998).

The training of these teams is essential to your safety effort’s success. The teams need to know what duties they can or cannot perform on the emergency scene, and how to initiate rescues as rapidly as possible. The training programs should stress how to do things right, but it should also prepare firefighters to react quickly and correctly when things go wrong. Choose methods and techniques carefully and deliver them systematically in a supportive, encouraging environment, based on sound principles of learning. Deep-seated behaviors will need to be overcome. It will take a concentrated and prolonged effort. The training must be comprehensive and understandable and recur annually, more often if necessary. The training program must be realistic and in line with the department’s capabilities. If it takes two engines to get four people on the scene, then this is what should be trained for (Edwards 1998). To train effectively we must provide a controlled atmosphere that duplicates real conditions. While everyday fireground skills are being honed there is no better time to practice rapid intervention skills. The Seattle Fire Department Officers Association, Seattle, Washington sponsored live-fire training with an emphasis on RIT skills. The morning session was dedicated to practicing rapid intervention skills including ladder carries, dragging and carrying downed firefighters, search, extrication, protecting in place, rescue air and a discussion of RIT tactics. In the afternoon session the participants practiced the newly learned skills in high-heat and heavy-smoke conditions (Beirne & Simpson 2001). Training continuously and realistically in both routine and not so routine fireground operations is essential and should encompass three critical areas. First, there is the
need of skill specific training in stretching hoselines of various sizes. Next should be physical strength and endurance training to help firefighters withstand the punishment of firefighter rescue operations. Finally, the needs to develop mental toughness to withstand the emotional rigors of firefighter rescue efforts, especially when they are unsuccessful.

Another drill is one that develops skill in advancing hoselines under difficult conditions while improving physical endurance and mental toughness and uses a SCBA confidence course sometimes called "mazes" (Fredericks 1999). Burlington (NJ) County Fire Department developed a two-part rapid intervention course. First, an introductory course composed strictly of classroom lecture and discussion. This course covers the history and need for rapid intervention, statistics on firefighter deaths and injuries, two video case studies on incidents where firefighters died, basic equipment and responsibilities, and a review of the county wide FAST guideline. The second course is an operations course, which focuses on firefighter rescue and what to do when the FAST is activated at an incident scene. The hands on emphasis of the operations course requires the use of props or a vacant structure to perform simulated firefighter rescues (Robertson 2000). A positive attitude about being on a RIT must be developed. Many firefighters feel as though they have been "benched" when assigned to the RIT. The RIT is present to rescue the rescuers. The team is often referred to as the "Firefighters 911" (Coleman 2000, July). Training, training and more training is the key to success in effective RIT operations (Cline 1999).

Telephone interviews were conducted with Alan Palomba, Assistant Chief of Operations with the Richardson Fire Department (RFD), Richardson Texas, Dave Owens, Battalion Chief with the Ogden City Fire Department (OCFD), Ogden City Utah, Douglas Farmer, Training Captain with Miami-Dade Fire Rescue (MDFR), Miami, Florida, and Bill Shomburg, Lieutenant with the
Boston Fire Department (BFD), Boston Massachusetts. These personnel were selected for interview due to the expertise and knowledge of rapid intervention with in their departments. They were also selected due to the location of the department they work for. The intent was to speak with personnel from different parts of the country to determine if things were done differently as it pertains to rapid intervention. The representation includes departments in the northeast, southeast, central, and western parts of the country. A telephone interview was conducted rather than a survey or other means of gathering information to ensure that a range of personnel from different levels of supervision was achieved. It was also done to ensure that the information was obtained from officers themselves and not passed off to an assistant to complete. This researcher felt these interviews were important to the project to gain personal insight to RIT operations that would not be achieved through a literature review alone. These interviews influenced this applied research project by providing information to help in developing a SOG for RIT operations for the DFD.

A summary of all these interviews concluded that all of the personnel interviewed have a rapid intervention team in their departments. Two of the departments call their team a RIC, one is called a RIT, and one is called a FAST. All of the departments have written procedures for RIT operations. Two of the departments only place their teams on standby for structure fires, one does for all IDLH atmospheres that can include hazardous material incidents, and one department can use their team during any hazardous incident that the incident commander deems appropriate. All the teams are deployed for lost, trapped or injured firefighters, and one can also be deployed for backdrafts, flashovers, or collapses. Equipment used by all the departments is basically the same. Three of the four departments use a RIT bag that carries forcible entry and other equipment needed to search and remove firefighters in distress. The other department puts
this equipment in a stokes basket to carry. All of the departments use a thermal imaging camera. Staffing seems to be the one major difference between the departments. Chief Owens’ department uses two personnel, Captain Farmer's department uses three, Chief Palomba's department uses two personnel initially and upgrades to four as soon as possible, and Lieutenant Schomburg's department uses four to five. Responsibilities seem to be the same with all the departments. While on standby the teams conduct reconnaissance of the scene looking for hazards and egress points, and assist with outside operations. When deployed their job is to search for and rescue firefighters in trouble. Training in all the departments is conducted annually and focuses of practicing RIT skills and tactics.

The data gathered in this section influenced this project by providing valuable information that answered the research questions and achieved the purpose of developing a SOG for RIT operation for the DFD. The information further demonstrated the need for RIT operations and that the procedures are basically the same throughout the country.

**PROCEDURES**

A two step process was used to develop a SOG for a RIT for the Deltona Fire Department. The applied research project was action based using a literature review and telephone interviews to answer the following research questions:

1. What State of Florida regulations and national standards exist in reference to a RIT?
2. When should a RIT be used?
3. What equipment is necessary for effective RIT operations?
4. What is the recommended staffing levels for an effective RIT?
5. What are the responsibilities of a RIT?
6. What training is necessary for an effective RIT?
The first step is to select literature relevant to RITs for review. This researcher felt this would be a necessary step in order to gain pertinent information to answer the research questions. A review of the 2000 Florida State Statutes was conducted to gain information on Florida regulations that might pertain to a RIT. Material from OSHA 29 CFR-1910.134 on *Respiratory Protection* and NFPA 1500 *Standard on Fire Department Occupational Safety and Health Program* was also reviewed to gain information on national standards that might pertain to a RIT. A review of other fire department SOGs was conducted to find information pertinent to the research questions. SOGs from the following department were reviewed:

- Miami-Dade Fire Rescue, Miami, Florida
- Richardson Fire Department, Richardson, Texas
- Phoenix Fire Department, Phoenix, Arizona
- Orange County Fire Rescue, Orange County, Florida
- Volusia County Department of Fire Services, Volusia County, Florida

Also a list of journals based on their relevance to the fire service were reviewed. The list of journals includes:

- *Firehouse*
- *Fire Chief*
- *The Voice*
- *Fire Engineering*
- *Fire Command*
- *Fire-Rescue Magazine*

The second step was telephone interviews. An interview with Doris Lee, an Administrative Assistant in the Division of Employment Security under Workers Compensation in the FDLES
was conducted. She was chosen due to her knowledge about the former Division of Safety within the FDLES. The purpose of this interview was to gain relevant information on Florida regulations that might pertain to a RIT. The interview was conducted on June 27, 2001 and lasted approximately 10 minutes. The questions for this interview are provided in appendix B. This researcher felt this interview was important to the project to thoroughly answer research question one. Next was a set of interviews with fire department leaders from across the nation and from different levels of supervision. The following personnel were interviewed:

Alan Palomba, Assistant Chief of Operations, Richardson (TX) Fire Department
Dave Owens, Battalion Chief, Ogden City (UT) Fire Department
Douglas Farmer, Training Captain, Miami-Dade (FL) Fire Rescue
Bill Shomburg, Lieutenant, Boston (MA) Fire Department

The purpose of these interviews was to gain information to answer the research questions and to achieve the purpose of developing a SOG on RIT operations for the DFD. Each interview lasted approximately 15 to 20 minutes. Interviews with Chief Palomba, Captain Farmer, and Lieutenant Schomburg were conducted on July 12, 2001 and with Chief Owens on July 24, 2001. The questions for these interviews are provided in appendix C.

Limitations

The scope of the research was limited to the education, training, and experience of the personnel interviewed and those that wrote or contributed information in the trade journals, SOGs, and national standards. It was further limited by the lack of Florida regulations or standards pertaining to a RIT. It also assumes that all information gathered is factual.
Definition of Terms

Backdraft. An explosion or rapid burning of heated gases in a confined structure (International Fire Service Training Association 1980).

Company. A group of members having the following characteristics: under the direct supervision of an officer or leader; trained and equipped to perform assigned tasks; usually organized and identified as engine companies, ladder companies, rescue companies, or squad companies; usually operating with one piece of fire apparatus (e.g., quint, pumper, ladder truck, elevating platform, rescue, squad, or ambulance); arriving at the incident scene on fire apparatus or assembling at the scene prior to assignment (National Fire Protection Association 1997).


Emergency Medical Services. The provision of treatment—such as first aid, cardiopulmonary resuscitation, basic life support, advanced life support, and other pre-hospital procedures including ambulance transportation to patients (National Fire Protection Association 1997).

Guideline. A written indication or outline of department policy that allows flexibility in application (National Fire Protection Association 1997).

Hazardous Area. The area where members might be exposed to a hazardous atmosphere. A particular substance, device, event, circumstance, or condition that presents a danger to members of the fire department (National Fire Protection Association 1997).

Immediately Dangerous to Life or Health (IDLH). Any atmosphere that poses an immediate hazard to life or produces immediate irreversible debilitating effects on health (National Fire Protection Association 1997).
**Incident Commander.** The fire department member in overall command of an emergency incident (National Fire Protection Association 1997).

**Incident Safety Officer.** An individual appointed to respond or assigned at an incident scene by the incident commander to perform the duties and responsibilities specified in this standard. This individual can be the incident safety officer or can be a separate individual, appointed by the incident commander, or a predesignated individual (National Fire Protection Association 1997).

**Member.** A person involved in performing the duties and responsibilities of a fire department, under the auspices of the organization. A fire department member can be a full-time or part-time employee or a paid or unpaid volunteer, can occupy any position or rank within the fire department, and can engage in emergency operations (National Fire Protection Association 1997).

**Personnel Accountability System.** A system that readily identifies both the location and function of all members that are operating at an incident scene (National Fire Protection Association 1997).

**Flashover.** The stage of a fire in which a room or other confined area becomes heated to the point that flames flash over the entire surface of the area (International Fire Service Training Association 1980).

**Personal Alert Safety System (PASS).** Device that provides life-safety protection by emitting a loud shriek if a firefighter should collapse or remain motionless for approximately 30 seconds (International Fire Service Training Association 1998).

**Positive-Pressure SCBA.** An SCBA in which the pressure inside the face piece, in relation to the pressure surrounding the outside of the face piece, is positive during both inhalation and
exhalation when tested by NIOSH in accordance with 42 CFR 84, Subpart H (National Fire Protection Association 1997).

**Pressure-Demand SCBA.** See Positive-Pressure SCBA (National Fire Protection Association 1997).

**Rescue.** Those activities directed at locating endangered persons at an emergency incident, removing those persons from danger, treating the injured, and providing for transport to an appropriate health care facility (National Fire Protection Association 1997).

**Self-Contained Breathing Apparatus** (SCBA). A respirator worn by the user that supplies a respirable atmosphere that is either carried in or generated by the apparatus and is independent of the ambient environment (National Fire Protection Association 1997).

**Size-up.** A mental process of evaluating all of the influencing factors at a fire prior to the commitment of personnel and equipment to a course of action (International Fire Service Training Association 1980).

**Standard Operating Guideline.** An organizational directive that establishes a course of action (National Fire Protection Association 1997).

**Structural Fire Fighting.** The activities of rescue, fire suppression, and property conservation in buildings, enclosed structures, aircraft interiors, vehicles, vessels, or like properties that are involved in a fire or emergency situation (National Fire Protection Association 1997).

**Working Structural Fire.** Any fire that requires the use of a 1-1/2-in. (3.8-cm) or larger fire attack hose line and that also requires the use of self-contained breathing apparatus for members entering the hazardous area (National Fire Protection Association 1997).
RESULTS

A literature review was conducted to obtain information for the applied research project. The results found that there are not any Florida regulations that pertain to a RIT. This researcher conducted a telephone interview with Doris Lee, an Administrative Assistant in the Division of Employment Security under Workers Compensation in the FDLES. Doris Lee advised that it would be all right for this researcher to interview her for this project. She advised when the Florida Legislature repealed Chapter 442, the Division of Safety within the FDLES was abolished. The Division of Safety had adopted rules from OSHA and NFPA on rapid intervention. This division also had the authority to enforce these rules. Once the Division of Safety was abolished, so were the Florida regulations and the authority to enforce them. She also advised that she was unaware of any other Florida regulations that pertain to rapid intervention (D. Lee personal communication, June 27, 2001). However, there are national standards that pertain to RIT operations. OSHA standard 29 CFR-1910.134 on Respiratory Protection and NFPA 1500 on Standard on Fire Department Occupational Safety and Health Program pertain to rapid intervention and the two in and two out rule. The two-in and two-out rule was the first step to having personnel outside an IDLH to rescue personnel inside an IDLH. The rapid intervention crew took this a step further by requiring that a crew of two be solely committed to rapid intervention duties only once there was more than one crew working in a hazardous area. The research indicated that a RIT was needed for standby when there are personnel working in a hazardous area unless there is a life that could be saved or serious injury prevented by entering this area. SOGs from Phoenix, Richardson, and Miami-Dade Fire Departments all require a RIT be in place before firefighters enter a hazardous environment. RIT should be deployed anytime a firefighter is lost, trapped or injured.
The results of this research indicate that there is a wide range of equipment needed for an effective RIT. OSHA requires that personnel working in an IDLH atmosphere be equipped with a positive pressure SCBA or a pressure demand or other positive pressure supplied respirator with auxiliary SCBA. In addition to the SCBA, NFPA requires personnel be equipped with appropriate protective clothing and equipment, and specialized rescue equipment that might be needed given the specifics of the operation underway. The Phoenix and Richardson Fire Departments have both developed RIC / SCBA kits. They both contain flash lights, door straps, sprinkler wedges, life lines with deployment bags, bolt cutters, channel locks, phillips and straight head screwdrivers, folding knife, wire cutters, and some variation of a SCBA with bottle. Miami-Dade Fire Rescue has developed a RIT bag with most of the same equipment except theirs also contains carabiners, tubular webbing, and tin snips. Other equipment that may be needed are a halligan tool, flathead axe, sledge hammer, hacksaw, hydraulic forcible entry tool, extension ladder, power saw, and air bags. A checklist is another valuable tool for a RIT to utilize. A checklist would help remind a RIT of the hazards to be aware of during the size-up of the fireground, the operations to monitor depending on the tactics that are being used, and list the equipment that may be needed.

The results of this research further indicates that recommended staffing levels for effective RIT require two personnel initially and be upgraded to four as soon as possible. OSHA requires at least two personnel on standby outside an IDLH atmosphere when personnel are working inside. It further requires that at least two personnel enter the IDLH atmosphere. This requires at least four personnel on scene before work can begin in an IDLH atmosphere, two inside and two outside (Occupational Safety & Health Administration 1998). NFPA has the same requirement as OSHA. However, it is more stringent requiring personnel to work in teams of
two, and requiring two personnel to be standing by whenever personnel are working in a hazardous area, not just an IDLH atmosphere (National Fire Protection Association 1997). OSHA allows one of the two personnel outside to perform an additional role so long as this individual is able to perform assistance or rescue activities and leaving this role does not jeopardize the safety or health of any other firefighter (Occupational Safety & Health Administration 1998). This is allowed by NFPA also. However, NFPA requires that once the incident moves past the initial stages, the RIC is required consisting of 2 personnel. The initial stages of an incident shall encompass the tasks undertaken by the first arriving company with only one team working in the hazardous area. The incident commander shall evaluate the situation and the risks to operating teams and provide one or more RIC's commensurate with the needs of the situation (National Fire Protection Association 1997). In the Richardson Fire Department, their initial RIC consists of two personnel that are upgraded to four as quickly as possible (Richardson Fire Department 2000). This is also done at the Phoenix Fire Department. The DFD averages a 10 personnel response with the first units that respond to structure fires. With rescue, fire suppression, ventilation, pump operations, and command duties needing to be accomplished a two person staffing for a RIT will only be feasible unless more units are called to the scene.

The results also indicate there are many responsibilities required of a RIT both on the fireground and while en route. When personnel are working inside an IDLH atmosphere, OSHA requires personnel outside on standby to provide effective rescue. The personnel outside must maintain visual, voice, or signal line communication with the personnel inside the IDLH atmosphere (Occupational Safety & Health Administration 1998). NFPA requires standby personnel outside a hazardous area any time there are personnel working inside a hazardous area.
The personnel outside the hazardous area shall be responsible for maintaining a constant awareness of the number and identity of members operating in the hazardous area, as well as their location and function and time of entry. The standby members shall remain in radio, visual, voice, or signal line communications. Initial attack operations shall be organized to ensure that, if upon arrival at the emergency scene, initial attack personnel find an imminent life-threatening situation where immediate action could prevent the loss of life or serious injury, such action shall be permitted with less than four personnel. No exception shall be permitted when there is no possibility to save lives or prevent serious injury (National Fire Protection Association 1997). OSHA allows this exception as well. While en route to an incident, the RIC should monitor the tactical channel and initiate the use of a tactical work board, noting the location or operating companies. The tactical work board should be continually updated. The RIC company officer should obtain from the incident commander a detailed briefing on the status and location of all assigned companies. All RIC members will assume a ready state, including full protective clothing and SCBA. The RIC company officer will closely monitor the assigned tactical radio channel at all times. In some cases, the RIC may need to conduct a reconnaissance to maintain awareness of working companies and conditions. In some situations protective hose lines may need to be pre-deployed. Forcible entry may be necessary. The RIC should assess the need for other access points to provide egress, rescue, and ventilation. When companies are operating on floors above ground, the RIC should consider pre-positioning ground ladders to allow for emergency egress and rescue. The team must be able to react immediately to emergency events at the incident. In all cases, the RIC must have the ability to rapidly deploy. Whenever a RIC is deployed, another RIC should be assigned as soon as possible. This will ensure further back up to the crews involved in a rescue operation. Upon a report of a lost, trapped or injured
firefighter, the incident commander should deploy the RIC to the last reported location of the lost or trapped firefighters. The RIC / SCBA rescue kits must be taken, as well as the thermal imaging camera if available (Richardson Fire Department 2000). Several responsibilities must be accomplished when it is decided that a RIT is needed to deploy. First, try to continue or establish radio communications with the firefighters in trouble. This should give you pertinent information about the firefighters in trouble, such as location, type of injuries or level of consciousness, type and extent of entrapment, and the amount of air left in SCBAs. While the RIT leader is obtaining this information, team members should be selecting and gathering their entry tools. The initial entry team should select only basic forcible entry tools so as not to slow the team during the search. If larger or specialized tools are needed after the size-up, a second team should enter with the equipment. In the case of firefighter victim search, technology exists to assist a rapid intervention team. The personal alert safety system (PASS) device has given firefighters an edge in finding a firefighter in distress. We can now use our ears to hone in on the location of a trapped firefighter. Using a search rope we can go straight for the PASS, reducing search time. If a thermal imaging camera is being used, an even quicker search time is achieved. As you enter the fire building, drop to your knees and maintain silence. Listen for a PASS device's audible signal and determine where it is coming from. This will determine the team's search pattern in the fire building. If a downed firefighter's PASS has not been activated, you must listen for calls for help, the striking of a tool, or radio transmissions. An operations officer should be sent to the rescue area if there is entrapment to assume command of the interior. Team leaders should not commit all team members to the rescue room if they are not needed (Crawford 1999). The RIT must consider the critical function of the emergency air supply. In most instances, when a broadcast is made for missing, downed, or injured firefighters, locating the
firefighters and ensuring an adequate air supply are the most important functions the RIT can provide, prior to getting them out (McMormack 2000). However, once a true emergency exists on the fireground, the RIT's task is clear: to remove the downed firefighter as quickly as possible (McLees 2000).

The result of this research reveals that training is necessary for an effective RIT. OSHA requires that an employer provide effective training to employees that are required to wear respirators. The training must be comprehensive, understandable, and recur annually, and more often if necessary. OSHA also requires that personnel outside an IDLH be trained to provide effective rescue of personnel inside (Occupational Safety & Health Administration 1998). The training of these teams is essential to a department’s success. The teams need to know what duties they can or cannot perform on the emergency scene, and how to effect rescues as rapidly as possible. The training programs should stress how to do things right, but it should also prepare firefighters to react quickly and correctly when things go wrong. Choose methods and techniques carefully and deliver them systematically in a supportive, encouraging environment, based on sound principles of learning. Deep-seated behaviors will need to be overcome. It will take a concentrated and prolonged effort. The training program must be realistic and in line with a department’s capabilities (Edwards 1998). To train effectively we must provide a controlled atmosphere that duplicates real conditions. Practicing these skills such as ladder carries, dragging and carrying downed firefighters, search, extrication, protecting in place, providing rescue air, and discussion of RIT tactics needs to be conducted. Then have the participants practice the newly learned skills in high-heat and heavy-smoke conditions. Live-fire training with an emphasis on RIT skills will provide quality training (Beirne & Simpson 2001). Training continuously and realistically in both routine and not so routine fireground operations is
essential. Physical strength and endurance training will help firefighters withstand the punishment of firefighter rescue operations. Mental toughness also needs to be developed so personnel can withstand the emotional rigors of firefighter rescue efforts, especially when they are unsuccessful. Another drill that develops skill in advancing hand lines under difficult conditions while improving physical endurance and mental toughness uses an SCBA confidence course sometimes called “mazes” (Fredericks 1999).

Burlington County Fire Department developed a two-part rapid intervention course. First is an introductory course composed strictly of classroom lecture and discussion. This course covers the history and need for rapid intervention, statistics on firefighter deaths and injuries, two video case studies on incidents where firefighters died, basic equipment and responsibilities, and a review of the county wide FAST guideline. The second course is an operations course that focuses on firefighter rescue and what to do when the FAST is activated at an incident scene. The hands on emphasis of the operations course requires the use of props or a vacant structure to perform simulated firefighter rescues (Robertson 2000). We must develop a positive attitude about being on a RIT. The RIT is there to rescue the rescuers (Coleman 2000, July). “Training, training and more training is the key to success” in effective RIT operations (Cline 1999).

The results of the first procedure of this applied research project, the literature review, provided information to answer the research questions. It further provided information to achieve the purpose of this applied research project to develop a SOG for RIT operations in the DFD. It also resulted in the conclusion that recommends that the DFD Training Division develop a course to train the DFD personnel on effective RIT operations.

Telephone interviews conducted with fire department leaders revealed that all the personnel interviewed had rapid intervention teams in their departments and their procedures were
basically the same. Two differences included the names they called their teams and the staffing
levels.

The results of the interview with Chief Palomba were that the RFD has approximately 150
personnel and has been using a RIC for about two years. The RFD does have a standard
operating procedure (SOP) for RIC operations but he was unsure of what standards they used in
its development. The RFD RIC is placed on standby at all structure fires and called into action
whenever a mayday was broadcast on the radio. A mayday would indicate there is a collapse or
a potential for collapse, or a firefighter is lost, trapped, or injured. Equipment that is essential to
RIT operations is contained in a RIT bag that is carried to the scene of the firefighter needing
assistance in addition to a thermal-imaging camera. Staffing for the RFD RIC is two personnel
initially and upgraded to four with additional companies as soon as possible. Important RFD
RIC responsibilities while on standby are to identify escape routes, to place ladders where
needed within those routes, and to keep track of the location of crews inside the fire building.
Important RFD RIC responsibilities after deployment are to search for and rescue the firefighters
needing assistance. Necessary training for a RFD RIC is conducting search drills for lost
firefighters and is conducted annually. Although the RFD has not needed to deploy their RIC in
the past, personnel like the fact that a RIC is on standby during structure fires and have a positive
attitude about serving on a RIC (A. Palomba, personal communication, July 12, 2001).

The results of the interview with Chief Owens were that OCFD has over 100 personnel, and
has been using a RIC for about two years. The OCFD does have a SOP for RIC operations and
OSHA and NFPA standards were used to help develop the SOP. The OCFD RIC is placed on
standby anytime personnel are working in an IDLH atmosphere, and called into action when a
firefighter is lost or trapped. Essential equipment for the OCFD RIC includes a RIT bag, forcible
entry tools, and a hose line. Staffing for the OCFD RIC includes two personnel. The responsibilities for the OCFD RIC while on standby include helping with outside operations while staying available for rapid deployment if necessary. Once deployed the OCFD RIC is responsible to search for and rescue the firefighter in trouble. Necessary training for the OCFD RIC includes a Firefighter Saving Your Own course conducted for all firefighters. OCFD RIC training is conducted annually. Although the OCFD has never had to deploy their RIC, their personnel understand the need and demand that a RIC be available at all structure fires. The OCFD lost one of its firefighters while he was on duty for another fire department that did not have a RIC. It took 27 minutes to find him. (D. Owen, personal communication, July 24, 2001).

The results of the interview with Captain Farmer were that the MDFR has 54 stations in its jurisdiction. They have been preparing and training to implement their RIT for almost two years and implemented their team in June of 2001. He advised that the MDFR has a procedure on RIT operations and that OSHA and NFPA standards were used to help in its development. The MDFR RIT is placed on standby at all hazardous incidents that the incident commander feels it is necessary. This can sometime include incidents where an IDLH atmosphere is not present such as auto accidents on the interstate during rush hours. The RIT is placed into action whenever a mayday is broadcast on the radio for a lost, trapped or injured firefighter. Essential equipment needed for a RIT include a RIT bag and forcible entry tools. Staffing for the MDFR RIT include three personnel. Responsibilities for the MDFR RIT while on standby are to assess the scene for hazards and to help with outside operations as long as they do not become exhausted. Once deployed the RIT is to locate and rescue the injured firefighters and call for assistance if needed. Necessary training for the MDFR RIT includes lecture and practicing skills for RIT operations. The MDFR also trains all firefighters in self-rescue techniques. RIT training will be conducted
annually. They have not had to deploy their team. MDFR personnel have a positive attitude about RIT operations (D. Farmer, personal communication, July 12, 2001).

The results of the interview with Lieutenant Schomburg were that the BFD has approximately 1,600 personnel. The BFD does have standing orders about FAST operations but he was unsure what standards were used in their development. The BFD places a FAST on standby at all structure fires and are deployed when a backdraft, flashover, or collapse occurs, or a mayday is broadcast on the radio. A mayday is broadcast whenever firefighters are lost, trapped or injured. Necessary equipment for a BFD RIT include forcible entry tools, a thermal imaging camera, a search rope, and a stokes basket. Staffing for a BFD RIT consists of four to five personnel. The responsibilities for a BFD RIT while on standby are to gather the equipment that may be necessary if they are called into action. If they are deployed, RIT responsibilities are to search for and rescue the firefighters in trouble. Necessary training includes practicing RIT skills in vacant buildings and mazes. The BFD conducts their training annually. BFD personnel feel that a FAST is necessary as they had personnel die in structure fires before their FAST was in existence (B. Schomburg, personal communication, July 12, 2001).

The result of the telephone interviews, the second step of this applied research project, also provided information to answer the research questions and provided information to develop an SOG for RIT operations for the DFD. It also provided personal insight and opinions about techniques that fire service leaders felt were essential to RIT operations.

The process by which the data in this applied research project was analyzed was to review all the information obtained in the literature and through the telephone interviews. The data was then compared to the researcher’s knowledge of the operating procedures of the DFD. Data that
was feasible to use in DFD operations and relevant to the problem and purpose of the applied research project indicated two results.

The first result of this research was to use the information obtained to develop a SOG on RIT operations for the DFD. This SOG is contained in appendix A. The second result was to recommend that the DFD Training Division use information in this research to help develop a course to train its personnel in effective RIT operations. Developing such a course is beyond the scope of this applied research project.

**DISCUSSION/IMPLICATIONS**

This researcher’s interpretation of the results of this study indicates information was obtained to develop a guideline for RIT operations for the DFD. The information that is provided in this applied research project would help develop a quality guideline in the DFD. The research also indicated the need to develop a training course in Effective RIT Operations.

Firefighting is an inherently hazardous occupation. The United States Fire Administration reports that about 100 firefighters die and 100,000 are injured annually (United States Fire Administration 1998). The State of Florida does not have regulations that pertain to rapid intervention teams. However, OSHA and NFPA have national standards for rapid intervention to increase safety for firefighters operating in hazardous areas. These standards require two personnel standing by outside a hazardous area whenever personnel are working inside these areas, unless a civilian is still inside and can be rescued when the personnel arrive. NFPA requires a RIT standing by whenever there is more than one crew working inside a hazardous area (National Fire Protection Association 1997). These teams should be called into action whenever a firefighter is lost, trapped, or injured and be staffed with between two and four firefighters depending on the department’s SOG (Coleman 2000, July). Fire departments across
the nation have met these standards. The State of Florida is not an OHSA state, and the DFD has not adopted the NFPA standard pertaining to rapid intervention; therefore we have no legal obligation to follow these standards. However, this researcher agrees with John (Skip) Coleman, Deputy Chief of Operations with the Toledo Department of Fire Rescue who wrote “we must recognize that these standards establish a “standard of care.” This can hold us liable if a firefighter were injured or killed, and following these standards could have prevented the death or injury” (Coleman 2000, February).

The DFD already has most of the equipment needed for effective RIT operations. NFPA requires that a RIT be equipped with protective clothing and equipment, SCBA, and any other specialized equipment that may be needed given the specifics of the operation underway (National Fire Protection Association 1997). Some departments carry a RIT bag to the scene of the lost, trapped or injured firefighter. This bag contains the tools necessary to search for, and give immediate assistance to, the firefighter in trouble. This bag includes flashlights, door straps, sprinkler wedges, rope, bolt and wire cutters, phillips and straight head screwdrivers, EMS equipment, thermal imaging camera, and an extra SCBA (Richardson Fire Department 2000). Some of the other equipment that may be needed is power and hydraulic tools, halligan tools, axes, ladders, air chisel, and airbags (Miami-Dade Fire Rescue 1999). With the exception of a thermal imaging camera, the DFD has all of this equipment. This researcher agrees with Andrew Fredericks with the Fire Department of New York when he writes that “RITs that are trained, and equipped with a variety of hand tools, power tools, and search ropes, have been instrumental in saving firefighter lives around the country” (Fredericks 1999). A check sheet should also be developed. It will assist the team by listing various equipment and duties of the RIT (Coleman 2000, July).
It is important for DFD personnel to be aware of the responsibilities of a RIT in order to provide effective rescue to fellow firefighters when needed. NFPA requires personnel outside a hazardous area to maintain communications with the personnel inside. They must also maintain constant awareness of the number and identity of personnel working in the hazard area (National Fire Protection Association 1997). A worksheet should be initiated while en route and maintained throughout the entire incident. The RIT company officer should obtain from the incident commander a detailed briefing on the status and location of all assigned companies. A RIT should conduct reconnaissance of the scene to identify and eliminate hazards and gain information that may be helpful should they be called into action. Throughout the incident they must be able to deploy immediately. Upon report of a lost, trapped or injured firefighter, the RIT should deploy to the last known location of the firefighter with the necessary equipment (Richardson Fire Department 2000). If a search is necessary, when entering the building the RIT should listen for PASS devices, striking of tools, or radio communications from the firefighters they are searching for (Crawford 1999). Once the firefighters have been found, the RIT should ensure that they have an adequate air supply (McMormack 2000). They should then be removed from the hazardous area as soon as possible (McLees 2000). This researcher disagrees with Lieutenant Bob Oliphant of the Kalamazoo (MI) Department of Public Safety when he writes “I am not sure a RIT is necessary for the typical room and contents or small commercial fire” (Coleman 2000, July). Anytime safety can be increase in the fire service it should be.

This researcher agrees with Douglas Cline of the Chapel Hill (NC) Fire Department when he writes that “training, training, and more training is the key to success” (Cline 1999). The results of this research indicate that the DFD will need to train its personnel to insure they are aware of their responsibilities as they pertain to RIT operations. OSHA requires that personnel be trained
annually if required to wear an SCBA (Occupational Safety & Health Administration 1998). RIT training programs should train personnel how to do things right and prepare firefighters to react quickly when things go wrong. It must be realistic and in line with the departments capabilities (Edwards 1998). A two-part course is recommended. The first part of the course should be an introductory course composed strictly of classroom lecture and discussion. This part of the course should cover the need for a RIT and RIT guidelines. The second part of the course should be an operations course. This part of the course should focuses on practicing RIT skills and tactics (Robertson 2000). If possible the participants should practice in high heat and heavy smoke conditions (Beirne & Simpson 2001). Throughout both parts, a positive attitude should be developed toward the need for and use of a RIT.

The implication of this research to the DFD organization is clear. Developing a SOG and training DFD personnel on RIT operations will increase safety of firefighters on the fireground. It has the potential of saving the lives and reducing the severity of injuries to firefighters. It also has the potential to boost the morale of department personnel by knowing other firefighters are standing by to rescue them if needed, and the department’s leaders have their safety in mind.

**RECOMMENDATIONS**

The problem is that the DFD does not have a SOG on RIT operations. To achieve the purpose of developing a SOG for RIT operations for the DFD, data was collected and supports two recommendations. First, that a SOG be developed for RIT operations for the DFD (see appendix A). The information obtained in this research should be used in such a way as to follow the SOG format currently used by the DFD. The SOG should follow the OSHA and NFPA national standards. It should require that a RIT be placed on standby at all incidents where firefighters are working in hazardous areas, and placed into action whenever a firefighter is lost, trapped, or
injured. It should require the use of a RIT bag that should contain the following tools: flash lights, door straps, sprinkler wedges, life lines with deployment bags, bolt cutters, channel locks, phillips and straight head screwdrivers, folding knife, wire cutters, and a SCBA with bottle. It should further require that the following equipment be readily available: a halligan tool, flathead axe, sledge hammer, hacksaw, hydraulic forcible entry tool, extension ladder, power saw, air bags, and EMS equipment including defibrillator and a stokes basket. It should require that two personnel be placed on standby initially and be upgraded to four personnel if possible. The responsibilities of RIT operations both during standby and after deployment need to be included. The personnel on standby outside the hazardous area shall be responsible for maintaining a constant awareness of the number, identity, and function of members operating in the hazardous area, as well as their location and time of entry. The standby members shall remain in radio, visual, or voice communications with personnel inside. When firefighters first arrive on the scene that contains a hazardous area and find that immediate action could prevent serious injury or save a life, entry into the area will be allowed when less than four personnel are available. If a RIT is assigned while en route to an incident, the team leader should monitor the tactical channel and initiate the use of a tactical work board noting the location of operating personnel. The tactical work board should be continually updated. On arrival, or when assigned, the RIT team company officer should obtain from the incident commander a detailed briefing on the status, location, and names of all assigned personnel. The RIT company officer will at all times closely monitor the assigned tactical radio channel and may need to survey the scene to maintain awareness of working companies and conditions. Forcible entry and protective hose lines may need to be established to protect firefighters and provide an extra way out of the building in emergency situations. The RIT should consider deploying ground ladders to allow for
emergency egress of the building when companies are operating on floors above the ground. When on scene, all RIT members will assume a ready state including full protective clothing and SCBA. The team must be able to react instantaneously to an emergency that would require their assistance and have the ability to rapidly deploy. Whenever a RIT is deployed another RIT should be assigned as soon as possible. This will ensure further assistance to the crews involved in a rescue operation. Upon report of a lost, trapped, or injured firefighter, the incident commander should deploy a RIT to the last reported location of the endangered firefighters. The RIT bag must be taken in, as well as the thermal imaging camera if available. Since the DFD does not have a thermal imaging camera this would only be available should other departments be on the scene. Before the RIT enters the building they, or the incident commander, should try to establish radio communications with the firefighters in trouble. Pertinent information such as location, type of injuries or level of consciousness, type and extent of entrapment, and the amount of air left in their SCBA should be gathered if possible. While this information is obtained the team should be selecting the equipment they will need including the RIT bag. The initial entry team should select only basic forcible entry tools so as not to slow the team during the search. If specialized tools are needed a second team should bring in the equipment. When entering the building to complete a firefighter victim search listen for a PASS device's audible signal to determine the location of the firefighter in trouble. Using a search rope we can go straight for the sound of the PASS, thus reducing search time. If something goes wrong and the RIT needs to evacuate they can follow the rope out and when the firefighters are found a second team can follow the rope directly to the scene. If a thermal imaging camera is being used firefighters can be found even quicker. If the firefighter's PASS has not been activated rescuers must maintain silence and listen for calls for help, the striking of a tool, or radio transmissions.
Once the firefighters have been located an officer should be sent to take charge of the rescue area. This SOG will promote a positive change and improve the organization by providing firefighters with guidelines to effectively rescue their own personnel should the need arise.

The second recommendation is for the DFD Training Division to develop and implement a training course on effective RIT operations. This training must be comprehensive, understandable, be delivered systematically in a supportive, encouraging environment. It should recur at least annually and more often if necessary. Long time beliefs will need to be changed. This course should be conducted in two parts. The first course composed strictly of classroom lecture and discussion. This part of the course should cover the history and need for rapid intervention, statistics on firefighter death and injuries, case studies on incidents where firefighters have died, basic equipment and responsibilities, and a review of the DFD RIT guideline. The second course should focus on firefighter rescues and what to do when the RIT is activated at an incident scene. Personnel should be instructed to know what duties they can or cannot perform on the emergency scene and how to initiate rescues as rapidly as possible. The training program should stress doing things right and also prepare firefighters to react quickly and correctly when things go wrong. The training program must be realistic and in line with the DFD's capabilities. Skills training must provided a controlled environment that duplicates real conditions. The course should teach and practice skills such as ladder carries, dragging and carrying downed firefighters, search, extrication, protecting in place, and providing rescue air. RIT tactics need to be taught and reinforced. Participants should practice RIT skills in high-heat, heavy-smoke, and live-fire environments. Training should be conducted in routine and not so routine fireground operations. Physical strength, endurance, and mental toughness should be developed. Simulated firefighter rescues in vacant buildings and the use of props provides
excellent training situations. The training must also develop a positive attitude about RIT operations.

Providing RIT training will improve the organization by insuring DFD firefighters are mentally prepared and have the skills and tactics necessary to conduct effective RIT operations.

These recommendations are provided for the DFD. They are also provided for any other future readers of this applied research project who wishes to develop a SOG for RIT operations in their organization.
REFERENCES


Richardson Fire Department. (2000). *Standard Operating Procedure: Rapid Intervention Company (RIC)*. Richardson, TX.


STANDARD OPERATING GUIDELINE
RAPID INTERVENTION TEAM

Tactical Guideline # 2122

1.0 PURPOSE
The purpose of this document is to establish guidelines for fire department personnel when functioning as a member of the Rapid Intervention Team in compliance with Occupational Safety Health Administration (OSHA) and the National Fire Protection Association (NFPA) standards.

2.0 RESPONSIBILITY
It shall be the responsibility of all fire department personnel to be familiar with this guideline.

3.0 REFERENCES

National Fire Protection Association Standard 1500 Fire Department Occupational Health and Safety Program

Miami-Dade Fire Rescue Policy and Procedure 58

Phoenix Fire Department Standard Operating Procedure M.P. 201.04 and M.P. 201.04A

Richardson Fire Department Standard Operating Procedure 1203.4

4.0 DEFINITIONS

Hazardous Area - The area where members might be exposed to a hazardous atmosphere. A particular substance, device, event, circumstance, or condition that presents a danger to members of the fire department

Immediately Dangerous to Life or Health (IDLH) - Any atmosphere that poses an immediate hazard to life or produces immediate irreversible debilitating effects on health.

Rapid Intervention Team - A group of two or more firefighters trained and equipped for the sole purpose of rescuing firefighters that become lost, trapped or injured in IDLH atmospheres or hazardous areas.

5.0 ATTACHMENTS

Rapid Intervention Team CheckSheet
6.0 INDEX

7.0 PROCEDURES

7.01 A rapid intervention team (RIT) shall be implemented at all incidents containing a immediately dangerous to life and health (IDLH) atmosphere or when the incident commander deems it necessary for hazardous areas. The RIT shall consist of a minimum of two personnel and be upgraded to four if possible.

7.02 Personnel working in an IDLH atmosphere shall work in teams of two and shall maintain visual or voice contact with each other.

7.03 Four personnel shall be on scene of an incident containing an IDLH atmosphere. Two personnel shall enter the IDLH atmosphere and two personnel will act as a RIT outside. Personnel may enter an IDLH atmosphere without a RIT present only if there is a chance to save a life. If personnel enter without a RIT present then the reason for entering shall be reported to the incident commander and documented in the incident report.

7.04 The RIT leader should be located as close to the command post as practical.

7.05 The RIT shall wear protective clothing including self-contained breathing apparatus and remain in a ready state to immediately deploy at all times.

7.06 The RIT shall at all times remain in visual, voice, or radio contact with the personnel inside the IDLH atmosphere.

7.07 The RIT shall constantly monitor the tactical channel.

7.08 The RIT shall keep track of the names, locations, functions, and time of entry of all personnel working inside the IDLH atmosphere on the apparatus command board and review the tactical worksheet.

7.09 The RIT team leader shall conduct reconnaissance of the incident scene and eliminate all hazards if possible, or if not possible report them to the incident commander. The RIT leader should also identify all means of egress and provide emergency means of egress if necessary.

7.10 The RIT shall gather all equipment that may be necessary given the circumstances of the incident.

7.11 Additional RIT(s) should be assigned to maintain a safe working environment for personnel operating at the scene of large or complex emergency incidents.

7.12 The RIT shall be deployed whenever a firefighter becomes lost, trapped or injured. The incident commander, as necessary, may also deploy the RIT.
7.13 When the RIT is deployed the incident commander shall provide a new RIT as soon as possible and should strongly consider calling for more units.

7.14 The incident commander should try to gather as much information from the firefighters in trouble as possible. Try to obtain why the firefighters need the RIT, their location, type and extent of any injuries, number of personnel needing assistance, and the amount of air remaining in their SCBA. Once this information is gathered it should be relayed to the RIT.

7.15 The RIT should deploy to the last known location of the crew in trouble.

7.16 The RIT shall take the RIT bag with them to the scene of the firefighters in trouble.

7.17 If a firefighter victim search is necessary the RIT should listen for the firefighter's personal alert safety system, the striking of tools, calls for help, or radio transmissions from the firefighters in trouble.

7.18 The last member of the first RIT to enter the building should tie a tag line to himself so that once the firefighters have been found other personnel can follow the line directly to the scene.

7.19 Once the firefighters have been found, the RIT should assess the medical condition and air supply of the victim. The RIT should also assess for immediate dangers and the need for further assistance. The victim should then be removed from the IDLH atmosphere as soon as safely possible.

7.20 Equipment contained in the RIT bag shall include the following tools: flash lights, doorstraps, sprinkler wedges, life lines with deployment bags, bolt cutters, channel locks, phillips and straight head screwdrivers, folding knife, wire cutters, and a SCBA.
RAPID INTERVENTION TEAM CHECKSHEET

SIZE-UP
- 1. Building dimensions (length x width x height).
- 2. Building occupancy.
- 3. Building construction type:
  - Wood frame.
  - Heavy timber.
  - Ordinary.
  - Noncombustible.
  - Fire resistive.
- 4. Placement of windows, doors, fire escapes, porches, and so on.
- 5. Potential danger of high-security doors, barred windows, building modifications.

TACTICS
- 6. Offensive, defensive, defensive-to-offensive.
- 7. Command operations:
  - Check tactics sheet or board.
  - Check accountability system.
  - Communication / incident commanders.
- 8. Ladders and truck operations.
- 9. Fireground time vs. progress.

EQUIPMENT
- 10. Stage equipment based on construction type:

Examples:

<table>
<thead>
<tr>
<th>Wood Frame / Heavy Timber / Ordinary</th>
<th>Noncombustible / Fire Resistive</th>
</tr>
</thead>
<tbody>
<tr>
<td>o Pickhead axes and pike poles</td>
<td>o Halligan bars</td>
</tr>
<tr>
<td>o Circular wood-blade saw</td>
<td>o Sledgehammers</td>
</tr>
<tr>
<td>o Ventilation chain saw</td>
<td>o Circular metal-blade saw</td>
</tr>
<tr>
<td>o Halligan bar and sledgehammer</td>
<td>o Torch</td>
</tr>
<tr>
<td>o Search rope</td>
<td>o Search ropes</td>
</tr>
<tr>
<td>o Emergency air supply or SCBA</td>
<td>o Emergency air supply or SCBA</td>
</tr>
<tr>
<td>o Charged hoseline</td>
<td>o Charged hoseline</td>
</tr>
<tr>
<td>o Ground ladder(s)</td>
<td>o Ground ladder(s)</td>
</tr>
</tbody>
</table>

OTHER OPERATIONS
- 11. Check with rehab officer / condition of firefighters.
- 12. Check with safety officer / compare information.
- 13. Relocate or add another RIT.
- 15. EMS for the RIT.
Appendix B

Florida Department of Labor and Employment Security
Division of Safety Interview Questions

Is it OK to interview you for my research paper?

What is your name and title of person speaking to?

When was the Division of Safety abolished?

Why was the Division of Safety abolished?

Did the Division of Safety cover Rapid Intervention laws for firefighter safety?

Who took over the responsibilities on the state level that the Division of Safety enforced?

Are there any other laws the Division of Labor has that pertain to Rapid Intervention?
Appendix C

Fire Service Leaders Rapid Intervention Team
Interview questions

What is your name and title?

What is the size of your department?

Does your department use rapid intervention teams?

How long have you been using rapid intervention teams?

Does your department have a rapid intervention team standard operating procedure or guideline?

What state or national standards did your department use to develop your department’s rapid intervention team?

How many personnel makeup a rapid intervention team in your department?

When are rapid intervention teams placed on stand by?

Under what situations are your rapid intervention teams called into action?

Has your department ever needed to use its rapid intervention team?

What are your rapid intervention team’s responsibilities before being called into action at an incident?

What are your rapid intervention team’s responsibilities after being called into action at an incident?

What equipment do you feel is essential for a rapid intervention team?

What training do you feel is necessary for a rapid intervention team?

How often does your department train in rapid intervention team operations?

How does your personnel feel about having a rapid intervention team available at incidents?