

Identifying Critical Components of Rapid Intervention Teams on Structural Fires for the Virginia

Beach Fire Department

Wilkerson C. Eric

Virginia Beach Fire Department, Virginia Beach, Virginia

**Certification Statement**

I hereby certify that this paper constitutes my own product, what where the language or others is set forth, quotations marks so indicate, and that the appropriate credit is given where I have used the language, ideas, expressions, or writing of another.

Signed:   
Date: 12-1-17

### Abstract

The problem is that the Virginia Beach Fire Department does not have a thorough standalone procedure that addresses rapid intervention team (RIT) requirements and regulations. The purpose of this applied research project was to elevate firefighter safety on the fire ground by identifying key elements of rapid intervention for latter inclusion in a departmental policy. A descriptive research method was used to develop and focus on recommendations that provide the Virginia Beach Fire Department (VBFD) direction for improving RIT practices and policies. Procedures included a literature review, external and internal questionnaires, radio transmission reviews, and an oral interview. The research questions that were used were (a) what local, state, and federal regulations, codes, and laws impact RIT procedures, and what is the current level of comprehension of these regulations, (b) what are the current practices in the VBFD for implementing and managing RIT, (c) What are other agencies doing and what practices have become industry best practices with regards to meeting RIT needs during structural firefighting, and (d) what liability or legal considerations are created by the development and possible implementation of a RIT standard operating procedure (SOP)? Research found the VBFD was inconsistent with current internal practices and policies. Recommendations were made to develop a new comprehensive SOP that addresses current internal practices, adheres to regulations and standards, and draws from industry best practices.

**Table of Contents**

Certification Statement ..... 2

Abstract ..... 3

Table of Contents ..... 4

Introduction .....5

Background and Significance ..... 5

Literature Review..... 8

Procedure ..... 16

Results..... 20

Discussion ..... 29

Recommendations..... 37

References..... 42

Appendix A..... 45

Appendix B ..... 48

Appendix C ..... 55

Appendix D..... 59

**Tables**

Table 1 *Apparatus Type for Staffing of RIT*.....25

## Identifying Critical Components of Rapid Intervention Teams on Structural Fires for the Virginia Beach Fire Department

The Virginia Beach Fire Department (VBFD) does not have a comprehensive standard operating procedure (SOP) regarding the use of Rapid Intervention Teams (RIT) for structural fires. The purpose of the research is to identify critical components that can be used in the development of a thorough standalone RIT policy for structural firefighting in the City of Virginia Beach. Descriptive research methodology was used to answer the following research questions: (a) what local, state, and federal regulations, codes, and laws impact RIT procedures, and what is the current level of comprehension of these regulations, (b) what are the current practices in the Virginia Beach Fire Department for implementing and managing RIT, (c) what are other agencies doing and what practices have become industry best practices with regards to meeting RIT needs during structural firefighting, and (d) what liability or legal considerations are created by the development and possible implementation of a RIT SOP?

### **Background and Significance**

The VBFD is a career department of about 450 uniformed members that provide an all hazards emergency response to a population of 448,479 residents (Hall, 2016). The city is home to 19 fire stations that house 20 engines, eight ladder trucks, two rescues, a hazardous material team, a technical rescue team and three fire boats (About the Virginia Beach Fire Department, 2016). The VBFD responded to about 370 working fires in 2016, averaging a little more than one fire per day. According to the National Fire Protection Association's report *United States Firefighter Injuries-2016*, there were 24,325 firefighter injuries on the fire ground, accounting for 39% of all firefighter injuries reported (Haynes & Molis, 2017). The leading contributor to fire ground injuries is contributed to overexertion on the fire ground (Haynes & Molis, 2017).

Due to the documented risk for injury on the fire ground, an effective plan must be in place to rapidly intervene and provide assistance to firefighters in immediate need.

RIT has been the term that the VBFD has used since the introduction of the concept to describe a backup team of trained firefighters, positioned in a safe area, that are readily available to provide help. As a part of recruit and incumbent training, all uniformed members of the VBFD have attended RIT training that includes the development of task level skills of personal rescue, avoiding problems, calling a Mayday and removing down firefighters. The concept of RIT was introduced to the VBFD over 20 years ago, and over the years the roles, responsibilities, attitudes and usage have changed and adapted. Early incarnations were made up of a two person team of firefighters standing next to command with a hose line and every tool available staged ready to go to work. Today the VBFD does not have a dedicated RIT policy and the policies that outline aspects of RIT procedures are lacking clear direction and uniformed adherence.

In 2007 the VBFD conducted large scale multi-company drills for the entire fire department using a department store for “Big Box” RIT training scenarios. As a result of the “Big Box” training, the VBFD in 2008 developed a RIT and Mayday handbook that was intended to be updated as needed, and RIT procedures were also included at that time as part of the Incident Command SOP. Despite the good intentions, to date, the handbook has not been updated and is no longer even part of the station library inventory. The Incident Command SOP was updated in 2015 and the decision was made to remove the comprehensive list of RIT procedures. Smaller portions of RIT responsibilities were included in lesser detail in SOP FS 5.02 Tactical Guidelines (2015) and SOP FS 5.38 Communications (2016); however, the VBFD does not have a comprehensive SOP that addresses RIT procedures on structure fires. In 2015 the RIT SOP and a new handbook were started but failed to gain the support of the command

staff. As a result, the RIT SOP has not been finished.

On May 17, 2016, the then Deputy Chief of Operations and now Fire Chief for the Virginia Beach Fire Department, during an operational staff meeting that was scheduled to address RIT procedures, explained that the VBFD needs to develop a comprehensive SOP that addresses RIT (Hutcheson, 2016). He emphasized that firefighter safety is the responsibility of all members of the VBFD, and the current policies do not provide the comprehensive procedures that are required from the VBFD command staff to successfully and effectively implement RIT (Hutcheson, 2016).

Identifying key concepts of RIT procedures is a functional necessity for the overall safety of all firefighters operating in the City of Virginia Beach. In the past the VBFD has had Mayday situations that involved personnel in an immediate danger to life and health (IDLH) atmosphere and in every incident the members have escaped without serious injury and without the utilization of RIT. However, the propensity for risk of injury has been clearly demonstrated year after year and although RIT has not yet been needed, the need for it in the future is a real and legitimate possibility. Identifying key concepts of RIT procedures will improve the overall readiness of the organization and provide a foundation to help manage these complex emotional and dangerous events.

One of the Executive Development curriculum goals is to use research to solve real-world problems that are facing fire departments (United States Fire Administration, 2016, pp. 13-4). This research was conducted to aid the VBFD to better plan, mitigate and manage incidents that effect firefighter safety and is a direct result of the Executive Development curriculum. The United States Fire Administration (USFA) has established five goals as part of its 2014-2018 strategic plan. By identifying key concepts of RIT procedures the VBFD will be better prepared

to care for its members and will be meeting the USFA goal of reducing life safety risk through preparedness, prevention and mitigation (United States Fire Administration, 2014, p. 9).

### **Literature Review**

In order to help gain a better understanding of current practices both, nationally and locally, assess for perceived deficits, and establish a foundation for the recommendation of change, a literature review was performed. The findings of the review helped to guide the descriptive research and the direction of the applied research project.

Currently the VBFD formal procedure requires that before entering an environment with an IDLH there must be two firefighters outside of the hazardous environment immediately available to make entry to provide help if needed before a crew of at least two other firefighters are permitted to make entry into an IDLH (Virginia Beach Fire Department, 2015, p. 4). The only exception to this rule that permits making entry into an IDLH before at least four personnel are on scene is when there is a probable rescue situation and the situation has been relayed over the radio to the responding Battalion Chief (Virginia Beach Fire Department, 2015, p. 4). The VBFD requires that the two firefighters that are outside the IDLH not be assigned any duties that are essential to incident mitigation or operation, such as incident command or driver pump operator (Virginia Beach Fire Department, 2015, p. 5). The VBFD formal procedure goes on to require that the incident commander establish a four person RIT as soon as possible whenever crews are operating in an environment that is considered an IDLH (Virginia Beach Fire Department, 2015, p. 5). RIT responsibilities are outlined in the VBFD Tactical Guidelines SOP FS 5.02 and provided below as:

- Face-to-face with command to assure adequate staffing,
- Complete a walk around of the building,

- Assign team responsibilities,
- Establish tool cash,
- Remove obstructions around the building,
- Note egress points,
- Place additional ladders as needed,
- Always maintain unit integrity,
- After completing tasks above RIT should maintain a restful posture (Virginia

Beach Fire Department, 2016, p. 5).

The VBFD has defined radio procedures for firefighters to follow in order to call for help and have included them in the VBFD Communication SOP FS 5.38. These procedures require a firefighter who is in need of help to broadcast over the radio “Mayday, Mayday, Mayday” followed by the unit designation and a brief explanation of the essential information (Virginia Beach Fire Department, 2016, p. 7).

The Virginia Department of Labor and Industry has adopted the nation standards outlined at the national level by the Occupational Health and Safety Administration (OSHA). In 1998 OSHA revised Title 29 Code of Federal Regulations (CFR) Section 1910.134, *Respiratory Protection Standard* to include standards that effect how fire departments make entry into an IDLH atmosphere (Hargarten, 1999). OSHA requires that before making entry into an IDLH atmosphere a backup team of two employees must be assembled outside of the IDLH and have the ability to communicate with the entry team that is comprised of at least two employees with a structural firefighting Self Contained Breathing Apparatus (SCBA) (Occupational Safety and Health Administration, 2012). This requirement was the foundation to the creation of the concept of two-in/two-out. OSHA allows one of the employees outside the IDLH to be assigned other

duties only if these duties do not in doing them put at jeopardy the members working on the incident (Occupational Safety and Health Administration, 2012). OSHA includes incident command as one of the acceptable ancillary roles that is permitted when assigned as an outside team member and allows for entry into the IDLH before the arrival of an outside back up team if there is a probable life safety concern (Occupational Safety and Health Administration, 2012).

The National Fire Protection Association (NFPA) has several national consensus standards that address practices that effect RIT and the initial implementation of back up teams. NFPA 1500, *Standard on Fire Department Occupational Safety and Health (2013)* is similar in its explanation to OSHA in the standards that it sets forth as requirements of an initial RIT that allows crews to make entry into an IDLH. NFPA 1500 has determined that fire departments shall provide personnel for the intended use of rescuing other firefighters during emergency operations (National Fire Protection Association, 2013, p. 27). Entry into an IDLH before a proper back up team is allowed only when immediate action has the potential to prevent life loss or serious injury; when this happens NFPA requires an investigation and a written report provided to the fire chief explaining the incident (National Fire Protection Association, 2013, p. 27). NFPA 1500 goes on to describe the term Mayday as the standard for firefighters to use to articulate that a member is in a life threatening situation (National Fire Protection Association, 2013, p. 24).

NFPA 1407, *Standard for Training Fire Service Rapid Intervention Crews (2015)* recommends that all departments have written RIT procedures that are reinforced by a comprehensive training program. NFPA 1407 (2015) goes on to recommend the use of the term Mayday and establishes a RIT report that includes:

1. The unit that is calling,

2. The situation that is encountered,
3. The unit's intentions,
4. Personal accountability report,
5. Nature of the emergency and conditions.

It is the recommendation of the NFPA that all incident commanders and firefighters be trained at the task and strategic level to avoid, mitigate and manage rescue scenarios that involve firefighters as the victim (National Fire Protection Association, 2015, p. 9). NFPA 1407 (2015) includes a sample SOP that includes a list of required equipment consisting of:

1. Radio for communication and monitoring radio traffic,
2. Spare SCBA or auxiliary air supply,
3. RIT kit and rescue rope kit,
4. Tools that reflect the type of construction or incident that is presented.

The sample SOP that NFPA 1407 (2015) presents makes allowances for RITs to throw ground ladders and perform necessary duties as long as the performance of these duties do not hamper the RIT's ability to perform rescue operations. A notable element that is absent from the sample SOP found in NFPA 1407 (2015) is a portion explaining two-in/two-out; in its place is the assignment of a RIT as a function of the dispatcher.

NFPA 1710, *Standard for Organization and Deployment of Fire Suppressions Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* (2016), establishes standards that allow for the use of an Initial Rapid Intervention Team (IRIT) of at least two firefighters available to rescue firefighters upon the onset of the incident involving a structure fire at a single family house fire. Once an incident escalates beyond the initial full alarm, the incident commander shall upgrade the IRIT team of

two firefighters to a full RIT consisting of four firefighters, to include one officer and three firefighters (National Fire Protection Association, 2016). When the fire incident involves any structure bigger than a single family residence, NFPA 1710 (2016) recommends the use of a full four person RIT and makes no allowances for an IRIT. NFPA 1710 (2016) recommends that if a fire department does not have sufficient staffing resources to allow for RIT or IRIT then they should utilize defensive firefighting strategies.

NFPA 1521, *Standard for Fire Department Safety Officer*, establishes the requirements for a safety officer in regards to the utilization of a RIT (National Fire Protection Association, 2015). The standard gives safety officers the responsibility of determining the need for RIT as well as the responsibility to make sure that RIT is available for deployment. NFPA 1521 (2015) does not provide guidelines for staffing levels or set a standard for levels of service, instead, it is focused on the safety officers' responsibilities of ensuring RIT is staffed.

NFPA 1561, *Emergency Service Incident Management System and Command Safety*, is a consensus standard that addresses the operation and management of emergency incidents. The standard states that when two firefighters enter an IDLH atmosphere at least two firefighters must be located outside of the IDLH in case a rescue is needed (National Fire Protection Association, 2014). NFPA 1561 (2014) defines the outside team as the Initial Rapid Intervention Team or IRIT. As the incident expands the IRIT will expand to become a dedicated RIT and will be made up of at least two firefighters (National Fire Protection Association, 2014). The difference between the IRIT and the RIT according to NFPA 1561 (2014) is the level of dedication of its team members. The IRIT can have a member involved in other activities as long as it would not interfere with a rescue attempt (National Fire Protection Association, 2014).

The Phoenix Fire Department has created a written procedure that addresses their

processes in managing a RIT and Mayday event. The procedure stresses the importance of preventing and responding to a Mayday situation at the task, tactical and strategic levels (Phoenix Fire Department, 2014). Phoenix Fire Department has adopted a concept of responding to a Mayday from inside the structure where the problem is and moving outward (Phoenix Fire Department, 2014). Their procedure includes a support model that recognizes the order from where help should be directed or diverted towards the Mayday. The Phoenix Fire Department's (2014) rescue order model is:

1. Self-rescue by the person calling the Mayday,
2. The crew of the firefighter who has initiated the Mayday,
3. Other crews working in the same area,
  - a. Crews engaged in firefighting activities,
  - b. "On-deck" crews or crews staged in a forward placed tactical reserve status,
  - c. Resources that have been requested from the Incident Commander,
4. Crews from other sectors, division or group,
5. Staged resources.

Phoenix Fire Department (2005) uses "On Deck" crews to serve as RIT. They define "On Deck" as a forward staging position outside of the IDLH (Phoenix Fire Department, 2005). The Phoenix Fire Department (2005) use "On Deck" crews as part of a work force management cycle that could include moving "On Deck" crews to positions that reinforce firefighting activities, crew relief or rapid intervention. This concept is used to create a tactical reserve of resources outside of the IDLH that can be assigned to developing needs. This is different from NFPA in that no one crew is dedicated to only RIT. All crews as part of the work cycle will move from interior to rehab and back to "On Deck." Key factors that the Phoenix Fire

Department (2014) stresses in the operational procedures are the proactive use of a strong incident command presence, working within an incident action plan, managing the work cycle of crews, and maintaining accountability of crews and effective communication with all resources.

The Phoenix Fire Department's order model is supported by the research completed by Don Abbott and his research project *Project Mayday*. Don Abbott (2015) has researched 1,371 Mayday situations and has found that 85.9 % of Maydays are resolved from crews working inside of the IDLH and that RIT are only successful 8.4% of the time. In regards to the successful rescue of firefighters, 27.9% were completed by self-rescue, 27.5% by the crew with the Mayday firefighter, and 30.5% by other interior crews (Abbott, 2015). Abbott's research also noted that rapid intervention is, in fact, not rapid, averaging 19 minutes to rescue one down firefighter and that one out of every eight RITs will have a Mayday during their attempt to make a rescue. Don Abbott's research is critical of two-in/two-out and is not in favor of any RIT that is staffed with less than four persons. Abbott reports that rescues will take four, six or 12 rescuers and anything less is considered a "check in the box" and of no real value. He stresses the importance of the Incident Commander's responsibility of managing the work cycle of crews in a Mayday situation to ensure tactical reserves are available and are not making the situation worse by putting too many firefighters in an area at one time. In addition, Project Mayday isolated the three most common reasons firefighters need help are inadequate fire experience, inadequate fire training and poor leadership, and emphasized improvements in these areas are key to not only the establishment of a functional RIT but also the potential reduction of the need for RIT (Abbott, 2015)

The legal ramifications of following regulations, codes, standards and procedures are far reaching and technical. The implementation of these rules effects individuals, departments and

cities and provides a baseline for the safety and welfare of the members that serve. Organizations and individuals can and are held liable for their actions and the results of their actions. The cloak of legal protection that has protected first responders is not absolute. “Strict Liability” is the legal term that applies to the liability that can be imposed in some states in a situation where injury or harm has happened in the absence of negligence or intent to do injuries (Feinman, 2000). According to Don Abbott (2015), of 182 maydays that resulted in permanent disability to a firefighter, 97 of them have pending lawsuits that are seeking damages against the fire department and its officers. Hartford Connecticut settled a \$350,000 lawsuit with the family of a deceased firefighter as a result of an in the line of duty death (Goode & Altimari, 2016). The Hartford Courant (2016) reported that the family members of the deceased firefighter wanted answers about the situations that lead to the fire department leaving behind their family member even after a mayday call was transmitted. The cloak of legal protection that has protected first responders is not absolute. The widow of a Georgia firefighter that died in a building collapse at a house fire has filed suit against the City of Waycross and the Fire Chief, listing them among the defendants that are responsible for her husband’s wrongful death (Varone, 2015). In Philadelphia after an 11 year veteran of the fire service dies following her Department’s Mayday procedures at a basement fire her family is going beyond civil action and asking for criminal charges to be brought against fire personnel (Saltzman, 2015).

The literature review significantly influenced the identification of key concepts that are applied to RIT by providing insight gained from reviewing NFPA standards and OSHA regulations. Further guidance was provided by reviewing Don Abbott’s research and its manifestation into procedures outlined in Phoenix Fire Department SOPs. Lastly the review of legal considerations echoed the importance of making good policies and having employees

adhere to the rules.

### **Procedure**

The purpose of this applied research project was to identify critical components of rapid intervention team procedures for structural firefighting in the City of Virginia Beach.

Descriptive research was employed in order to meet the following objectives;

1. Gather and research local, state, and federal regulations, codes, and laws that impact RIT procedures and determine the current level of comprehension of these regulations.
2. Identify current practices in the Virginia Beach Fire Department that are being utilized for implementing and managing RIT activities on the fire ground.
3. Identify industry best practices by researching what other agencies are doing with regards to meeting RIT needs during structural firefighting.
4. Identify liability and legal considerations that are created by the development and implementation of a RIT SOP.

The procedures that were followed in order to meet the above objectives started with an in depth review of literature that focused on providing clarity in understanding laws, standards and local policies that effect the handling of RIT procedures. Further review included appraising research from agencies researching commonalities in Mayday incidents and other departments RIT operating procedures. The literature review concludes with focusing on reviewing simple legal principles and looking at particular court cases and their effect on localities, departments and individuals. Original research was conducted by the use of questionnaires, radio communication analyses and an interview with a subject matter expert.

An internal departmental questionnaire, *VBFD RIT* (Appendix A), was administered to

all uniformed members of the VBFD. It was developed to recognize current VBFD practices, to assess members understanding of current operating procedures, and to identify industry best practices. The questionnaire was sent out by e-mail to all 450 members of the VBFD and 208 members provided a response. The responses were then tallied and computed to yield percentage based responses as well as free text answers.

An additional questionnaire, *Rapid Intervention* (Appendix B), was developed and administered to members of the fire service outside of the VBFD. The external questionnaire was placed on fire service related forums and was distributed via email to members of multiple departments. Members were asked to answer questions that provided research on common rapid intervention practices as well as the meeting of national standards and best practices. In regard to the sample size and representative data, 88 responses were received, representing departments ranging from less than 50 to greater than 600 members, as well as career, volunteer and mixed departments.

Another method of original research utilized was the analysis of digital recording of radio transmissions from structure fires within the City of Virginia Beach. Each transmission was assessed for specific criteria being communicated over the radio, including consideration of two-in/two-out, building occupancy, initial tactics, and communication of the establishment of a RIT. Transmission included in this portion of research was limited to fires that required crews to make entry into an IDLH atmosphere. Defensive and transitional attack first were included only if interior attack was made shortly after the arrival of the initial units. The findings of the analyses are summarized in Appendix C.

The third method of personal research, personal interview, was conducted to provide insight into legal considerations of RIT and adherence to regulations and guidelines. At 1300 on

September 28, 2017, Marjorie A. Smith J.D., Senior Attorney for the City of Virginia Beach, was interviewed. Senior City Attorney Smith has been in the legal field for 22 years and is the authority for legal matters that impact employees, including safety regulations and guidelines. Appendix D details the questions asked during this interview.

### **Limitations**

This research project starts with the assumption that RIT is a necessary tool that can have a positive effect on firefighter safety. It is therefore a responsibility of all decision makers on the fire ground to utilize these teams in the most effective and advantageous way. The research was limited by the education, experience, and training of all personnel that contributed to the documents and research that provided critical findings included in the literature review. It is assumed that all information that was included was factual and non-biased in nature.

The research that was obtained through the use of both internal and external questionnaires has associated limitations. First, the lack of experience of developing questionnaires has the potential to negatively affect the research. Next, questionnaire response rates were low for both the internal and external questionnaires. If questions were misleading or confusing, the answers may not truly be representative of current thoughts or practices. Also, a small sample size has the potential to exclude legitimate concerns or display skewed data. The questionnaire was sent out to all uniformed members of the department including staff positions that included Fire Prevention personnel and administrative positions. These positions are not always included in station drills and could be responsible for artificially inflating responses that indicated they have not participated in a RIT drill in the last year. Another significant disadvantage of the questionnaire method is that there is no provision for authenticating that answers to the questions were answered truthfully or that the person providing the answers had

the experience and knowledge to provide proper insight into the subject matter.

Analysis of radio communications has its own inherent limitations. Although digital recordings are high quality in comparison to earlier recordings, some fires had to be excluded from the study because of missing transmissions. Currently the City of Virginia Beach's digital recording system only has space to save six months of radio transmissions. Older more significant fires were saved on external hard drives for use in training scenarios or to review significant events on the fire ground. Although these fires were included in the research, other less prominent fires were not recorded as their transmissions were not saved, therefore leaving potential for gaps in fire ground tactics. A limitation of radio transmissions is that they do not provide the same level of clarity that on scene observations do as there is no accounting for face to face communication. For example, when other responding units arrived on scene and were considered in regard to the establishment of a two-in/two-out tactical reserve, the only way to verify this communication occurred was by reviewing if the transmission was given over the radio. Often times, this type of communication occurs offline and off-air, so the absence of it in the radio transmission does not necessarily signify that the communication itself did not take place.

Limitations associated with the personal interview included the ability of both parties to understand and articulate questions and responses. Considerable time was spent on formulating questions and establishing a relationship that would help foster an environment of discovery. The interviewee was selected based on her experience and expertise; however, one on one interviews limit the sample size and other points of view. Also, with the knowledge of possibly having responses published, the respondent may have provided more politically correct responses instead of their own personal beliefs or viewpoints on real-life practices.

### **Definitions and Terms**

1. Rapid Intervention Team (RIT)- A team of firefighters that are dedicated to the assignment of rapid rescue of other firefighters (National Fire Protection Association, 2015)
2. Initial Rapid Intervention Team (IRIT)- A team of at least two firefighters available outside of a hazardous atmosphere available to rescue firefighters upon the initial stages of a structure fire (National Fire Protection Association, 2016)
3. Working fire- a term used in the Virginia Beach Fire Department by an on scene unit to confirm that the incident involves a structure fire
4. Fire control- a term used by the Virginia Beach Fire Department to indicate that the fire is under control and overhaul operations are beginning

### **Results**

Four questions were developed to highlight key components of rapid intervention procedures necessary for the development of a RIT SOP. First, what local, state, and federal regulations, codes and laws impact RIT procedures, and what is the current level of comprehension of these regulations? Next, what are the current practices in the VBFD for implementing and managing RIT? Also, what are other agencies doing and what practices have become industry best practices with regards to meeting RIT needs during structural firefighting? Finally, what liability or legal considerations are created by the development and possible implementation of a RIT SOP?

**What local, state, and federal regulations, codes, and laws impact RIT procedures, and what is the current level of comprehension of these regulations?**

As noted in the literature review, RIT activities in the City of Virginia Beach are impacted by multiple standards and SOPs, including, but not limited to:

1. Virginia Beach Fire Department Standing Operating Procedures:  
VBFD Tactical Guidelines SOP FS 5.02,  
VBFD Communication SOP FS 5.38,
2. Occupational Safety and Health Administration (OSHA) 29CFR 1910.134,  
*Respiratory Protection,*
3. National Fire Protection Association (NFPA) standards:  
NFPA 1500, *Standard on Fire Department Occupational Safety and Health,*  
NFPA 1407, *Standard for Training Fire Service Rapid Intervention Crews,*  
NFPA 1710, *Standard for Organization and Deployment of Fire Suppressions Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments,*  
NFPA 1521, *Standard for Fire Department Safety Officer,*  
NFPA 1561, *Standard for Fire Department Incident Management System.*

Despite the vast number of resources present to impact RIT, there is truly no significance or bearing if the department and its members do not recognize and understand their implications and influence. The questionnaires utilized were able to adequately assess the VBFD's understanding and readiness to implement the current rapid intervention strategies. Of the 208 responses provided to the internal questionnaire, 190 members, or 91.35%, validated that they were comfortable in their understanding of the rules outlined in VBFD policies, NFPA standards

and the code of federal regulations that govern two-in/two-out; however, only 70.19% of the respondents reported that they were comfortable in their understanding of the respective policies, standards and regulations that govern RITs.

**What are the current practices in the VBFD for implementing and managing RIT?**

The internal questionnaire, *VBFD RIT*, assessed for VBFD current practice and adherence to OSHA and NFPA standards in regard to two-in/two-out. Of the respondents, 66.83% felt the department is compliant in this area, 21.6 % disagreed, and 11.54% were undecided. The response to the same question in regard to RIT standards set forth by OSHA and NFPA was substantially lower with only 50.24% citing compliance and 19.32% citing noncompliance. Overall, 49.75% either did not know or did not think that the VBFD was doing what was required either by consensus standards or by code of federal regulations in regard to rapid intervention. The *VBFD RIT* also assessed if current VBFD practices included training on RIT procedures. Respondents indicated that 88% of the department has participated in RIT training during the last year.

*VBFD RIT* assessed VBFD needs for a RIT SOP, Two-in/Two-out SOP, and/or RIT Procedural Manual and/or Training Manual. Respondents were asked to select which SOP and/or manuals would be beneficial to implement in the future. Of the responses, 62.44% supported the development of a RIT Training Manual, 58.88% supported a RIT SOP, and only 29.4% supported a Two-in/Two-out SOP.

To achieve a better understanding of the current VBFD practice of the two-in/two-out requirement, respondents were asked to categorize how two-in/two-out was accomplished. A majority of the responses, 63.32%, indicated that the use of members from the second apparatus on scene were being used to meet the two-in/two-out requirement, whereas 26.09% asserted that

the VBFD operates under the presumption that all buildings are occupied and therefore do not feel two-in/two-out applies. 8.21% indicated that the initial engine leaves personnel outside to meet two-in/two-out.

Additional research was conducted to confirm and identify current VBFD RIT practices by reviewing radio transmissions of working fires that happened within the city limits. The radio transmissions compiled information on only fires that crews were able to make an interior attack either upon arrival or soon after arrival. This research was designed to identify if current practices are aligned with current departmental operating procedures and national standards. The research was completed on 57 working fires and focused on the following data points:

1. How often did radio transmissions of the first arriving engine officer articulate two-in/two-out needs before making entry?
2. How often did radio transmissions articulate if RIT was in place before entry?
3. How often did radio transmissions indicate that a RIT was established during the incident?

The results found that VBFD members are not communicating over the radio to the incoming battalion chiefs or other arriving apparatus that two-in/two-out was needed or was not needed. No instance was found when the first arriving engine officer announced anything about having an initial rescue team in place or following the two-in/two-out guidelines before making entry. In nine incidents, radio communication either from the dispatcher or the first on scene officer announced that there was a possible rescue situation or that the building was occupied; however, in 100% of the 57 fires that were included in the study, no radio communication was made in regard to communication of the need, the establishment, the following, or the foregoing of the two-in/two-out policy. Despite the lack of radio transmission, of the fires included in the

study, RIT was established 64% of the time. The establishment of RIT happened before entry on 15% of the fires. Of those incidents that established RIT, 47% were established after initial entry and six of those times after fire control was communicated by the incident commander over the radio. In the *VBFD RIT*, members were asked if pre-designating a RIT apparatus at the time of alarm was a preferred option. Responses indicated that over half of the respondents, 59.42%, were not in favor of pre-assigning a unit as the RIT apparatus.

The *VBFD RIT* questionnaire gathered data on what members of the VBFD felt should be included in a RIT SOP as well as their preference and understanding of the “On Deck” model for staffing RIT. The top four responses all with greater than 60% response in regard to a RIT SOP were;

1. Positions, roles and assignments within a RIT,
2. Responsibilities/ functions of the RIT,
3. Minimum equipment needs for RIT,
4. Size of RIT.

The internal feedback form found that 65.85% of the responses were familiar with the “On Deck” deployment model for RIT. Respondents that were familiar with the “On Deck” model were in favor of using it by a margin of two to one.

**What are other agencies doing and what practices have become industry best practices with regards to meeting RIT needs during structural firefighting?**

The external RIT questionnaire, *Rapid Intervention*, was used as a tool to find and identify what other agencies are doing to meet RIT requirements and ensure firefighter safety. The largest response rate, 67.05%, came from members of other career departments. Of the provided responses, 28.41% came from departments similar in size to that of the VBFD, and

25% came from cities that had populations comparable to the City of Virginia Beach. The questionnaire found that most responses, 72.73%, answered that the term that was used to identify their rapid intervention contingency is RIT. The responses indicated that 93.18% of the departments included had a procedure that addressed rapid intervention and 90.91% of those departments RIT policy included provisions to meet the two-in/two-out standards.

Staffing of IRIT and RIT can be accomplished many ways. In the case of IRIT the use of a driver or incident commander is an option that some departments utilize. The external questionnaire found that 60.23% of the responses provided indicated that their department allows the initial incident commander or the driver of the initial apparatus to be counted towards the two-in/two-out standard. The staffing of RIT was more divided and the data found that three person minimum staffing for RIT was the most common at 38.64%. Two person minimum staffing and four person staffing of RIT tied at 27.27%. Five person minimum staffing for RIT received 3.41% of the responses.

The breakdown of what apparatuses are being used to staff RIT was captured in the department feedback form. The questionnaire allowed the picking of more than one response and allowed for comments. The intent was to capture what type of units are allowed to be used for RIT and what unit type was most often being utilized to meet RIT requirements.

Table 1

*Apparatus Type for Staffing of RIT*

| Apparatus Type | Responses % | Responses # |
|----------------|-------------|-------------|
| Engine         | 92.05%%     | 81          |
| Ladder Truck   | 80.68%%     | 71          |
| Rescue         | 56.82%%     | 50          |
| Ambulance      | 26.14%%     | 23          |
| Tanker         | 5.68%       | 5           |
| Other          | 14.77%      | 13          |

The 14.77% that indicated other provided explanation that allowed for other configurations of RIT. One of the responses explained that firefighters responding in their personally owned vehicles were utilized as RIT. Three more explained that a squad or heavy rescue were utilized for RIT. Four other responses explained that RITs were made up of members from all types of apparatuses and combined together on scene. The other four responses explained how engines and ladders from other jurisdictions or within their localities were used to make up RIT.

Another focus area was how departments are assigning RITs. The questionnaire asked if departments were currently dispatching or pre-designating fire apparatus as a RIT as part of the run order. If departments were assigning a RIT apparatus as part of pre-assignment guidelines, what apparatus was the RIT truck? A majority of responses from the external questionnaire, 56.82%, indicated that their department used pre-assignment to designate their RIT. The make-up of this majority had no decisive leader. The largest affirmative response garnered 29.55% of the responses and it was the “Other” category. Research into the explanations provided under the “Other” category found no discernable best practice or clear leader in what apparatus most departments were assigning as RIT. Although a majority of the departments are utilizing unit pre-assignments to staff RIT, the largest group noted in this questionnaire came from departments that do not use the run order to define what apparatus would staff RIT at 43.18%.

The departmental feedback external questionnaire captured training trends by focusing on if departments were providing RIT training and the frequency that members were participating in training. Data found that departments are providing RIT training to their members. The research found that 94.32% of responses indicated their department was providing RIT training and 92.05% had participated in a RIT training within the last year.

The equipment needed for RIT can be influenced by many factors. The study used the questionnaire feedback form to capture what was considered as minimum RIT tool requirements across many departments. The research found that five leading tools that were considered to be the minimum requirements for a RIT are;

- |  |        |
|--|--------|
| 1. Extra SCBA, RIT bag or auxiliary air supply | 97.73% |
| 2. Radio                                       | 95.48% |
| 3. Thermal Imaging Camera                      | 92.05% |
| 4. Flashlight                                  | 86.36% |
| 5. Search rope or tag line                     | 84.09% |

The only other tools that were considered to be part of the minimum tool cache with response generating greater than 40% were a Halligan and an axe with responses between 65% to 75%.

Data was gathered to define trends on where and how departments position RIT once it has been established. When asked to provide feedback on where RIT stages during an incident the responses indicated that on scene decision making was utilized more often than operating procedures or standing orders when defining where a RIT would stage. Of the responses, 77.01% indicated that either the incident commander or the RIT leader was responsible for setting a location for RIT. These two decision makers were almost evenly represented with the incident commander gathering 39.08% of the responses and 37.93% of the responses indicating that the RIT leader was the one that staged the team. 18.39% of the responses indicated that the front of the building per the operating procedure governed where a crew will stage; however, when reviewing the 12.64% that indicated other, four additional responses showed that their standing orders govern where RIT positioned, either at the front of the building or where teams made entry.

The forming of a RIT can have an effect on the number of units needed on a fire scene. What activities a RIT is allowed to do once it is established can have implications on the calling for additional units or the work cycle for units on scene. This questionnaire evaluated if departments were allowing their RITs to do ancillary activities on the fire scene. The stipulation to these activities were that in doing them they would not slow down the rescue response if needed and the activities were not essential in nature that they could not be stopped if resources were needed for rescue. The questionnaire found that 85.06% of the responses indicated that RITs were allowed to be involved in or were assigned ancillary activities on the fire scene.

**What liability or legal considerations are created by the development and possible implementation of a RIT SOP?**

Virginia Beach Senior City Attorney Marjorie A. Smith J.D. was interviewed to provide insight into the legal considerations surrounding the regulations and guidelines concerning RIT. Senior City Attorney Smith explained that NFPA is a consensus standard and as such does not carry the same legal requirements as regulations that are defined by OSHA. The Commonwealth of Virginia has adopted OSHA regulations as law and as such they take precedence over standards and guidelines as long as they do not conflict with other legal statutes (Smith, 2017). All serious injuries must be reported by the city to Virginia OSHA and will result in an investigation that can lead to fines or citing of corrective actions needed (Smith, 2017). Senior City Attorney Smith (2017) explained that all states are different and cautioned against looking towards other states as a guide to how workman compensation cases are handled in the state of Virginia. Virginia State law requires that all employers have a minimum amount of workman's compensation insurance and if an employee is injured on the job, the employee is awarded compensation from workman's compensation insurance, providing oversight for workers as well

as protecting employers from separate civil suits (Smith, 2017). Senior City Attorney Smith (2017) stressed that adherence to Virginia OSHA is a must and regardless of if regulations, policies, or standards were known or unknown, failure to comply by an employee can result in disciplinary action. During the interview, Senior City Attorney Smith (2017) was asked if incident commanders could be charged criminally for their actions on a fire ground in regard to not following Virginia OSHA, and she explained that outside of cases that involve assault or theft, incident commanders that were acting in good faith were afforded legal protection. Senior City Attorney Smith (2017) explained that attorneys are a creative group of people and that bringing a law suit can be brought up under esoteric nuances of the law, but the city is confident that in general it would be hard for employees to bring a case that would have legal precedence in regards to both criminal or civil suits surrounding RIT regarding OSHA, NFPA or city policy. Private citizens have an even greater burden of proof in regard to bringing a successful law suit against the city and must prove gross negligence for safety when suing the city (Smith, 2017). Senior Attorney Smith (2017) advised that city policy must follow Virginia OSHA regulations and should include best practices or industry standards like NFPA whenever possible or appropriate.

### **Discussion**

The purpose of this applied research project was to identify key concepts for consideration in RIT procedure development. The comparison of the literature review with the results of the original research has identified key ideas and practices for inclusion in the practical application of RIT as well as procedural development and enforcement. The inherent danger of structural firefighting emphasizes the need for a correctly planned, deployed, equipped and prepared fire department in RIT operations.

The development and planning for RIT activities has been shaped by the laws, regulation and standards that effect a fire department's ability to govern its procedures. The literature review found five standards, two procedures and one law that effect the way the Virginia Beach Fire Departments conducts RIT operations. OSHA clearly requires that a backup team of two employees be assembled outside of the IDLH, with the ability to communicate, before a two person team is allowed to make entry (Occupational Safety and Health Administration, 2012). The requirement for fire departments to provide resources for firefighter rescue is echoed in NFPA 1500, *Standard on Fire Department Occupational Safety and Health*, NFPA 1407, *Standard for Training Fire Service Rapid Intervention Crews*, NFPA 1710, *Standard for Organization and Deployment of Fire Suppressions Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*, NFPA 1521, *Standard for Fire Department Safety Officer*, and NFPA 1561, *Standard for Fire Department Incident Management System*. The Virginia Beach Fire Department has adopted wording that coincides with OSHA and NFPA in its Tactical Guideline operating procedure that requires that before making entry into a hazardous environment, and when there is no indication of a possible rescue, a two person team outside the IDLH must be assembled (Virginia Beach Fire Department, 2015).

The original research provided by the departmental questionnaire delivered insight into department members' comprehension of the rules and regulations that effect decision making on the fire ground. The research found that department members were more comfortable in their understanding of the rules and regulations with regards to two-in/two-out than with RIT. This possibly explains why members feel that an SOP that addresses two-in/two-out is less needed because they are confident that this standard is currently being met. Members may surmise that a department policy is not needed if the regulation and standard is being adhered to. Although

the research found only 8.65% of the people were uncomfortable with their understanding of two-in/two-out, it found that 29.81% of the department was uncomfortable with their understanding of the VBFD policies, NFPA standards or OSHA regulations that govern RIT. Almost a third of the department indicated they had question in regard to their understanding of RIT and three times the amount of people were uncomfortable with their understanding of RIT. Having almost a third of a department uncomfortable with the important issue of RIT is indicative of how important a strong RIT policy is and how important it is for the VBFD.

When comparing the information from the literature review with standing operating procedures, it was found that the Virginia Beach Fire Department has created operating procedures that address NFPA standards and OSHA regulations in regard to two-in/two-out. When contrasting this information with practical application gained from the radio review of working fires there is a significant discrepancy. Virginia Beach Fire Department Tactical Guidelines SOP FS 5.02 (2015) requires that the first arriving engine officer indicate by radio the need for or establishment of two-in/two-out. The radio review found no incidents where this information had been articulated over the radio as expressed in the operating procedure. The practical application is in contrast to the SOP and when combined with the understanding that was gained from the questionnaire on how initial officers were establishing two-in/two-out, the Virginia Beach Fire Department is potentially functioning outside of NFPA recommendations. The internal VBFD questionnaire found that 62.32% of the people who responded felt the initial officer was meeting two-in/two-out with the use of the second arriving apparatus. This practice is allowed under current NFPA, OSHA and VBFD policy. The remaining 37.68% of the people that answered the question provided answers to the questionnaire that are not compliant with current rules and regulations or are impossible with staffing requirements of the first arriving

apparatus. The most troubling response to the questionnaire of how VBFD was staffing two-in/two-out, with 26.09% of the responses, indicated that VBFD operates under the assumption that all buildings are occupied and therefore two-in/two-out does not apply to the VBFD. This answer is not compliant with VBFD policy and NFPA standards. The radio research does not provide conclusive data on whether the VBFD is violating the two-in/two-out OSHA regulations. It does provide evidence that initial officers are not following current VBFD procedures and NFPA guidelines and highlights a potential knowledge deficit and area for improvement. The radio review combined with the internal questionnaire found that although most people felt that the next arriving apparatus was serving as the outside team, there was no communication on the radio that would indicate this practice is currently in place. Conclusively determining if the second apparatus was on scene before making entry could not be ascertained through radio review. The use of additional apparatuses to serve as the IRIT is an accepted practice but not articulating the need for an IRIT and a quarter of the department assuming all structures are occupied is an adaptive challenge facing the VBFD in training its members in their understanding and implementation of two-in/two-out. The VBFD SOP on tactical guidelines (2015) does meet current interpretation of the two-in/two-out rules and regulations reviewed as written and the universal deviation from the written policy is a concern that further supports the need for a strong all-encompassing RIT policy and departmental adherence.

The meeting of the two-in/two-out requirements provides on scene resources for initial rescue until more dedicated resources can establish a formal RIT. The radio research found evidence that the establishment of a formal RIT had been done 60% of the time on offensive working fires over the radio. Radio transmissions are not the ideal indicator of if RIT was established when on scene conditions required; however, it does indicate that as a trend RIT is

being used more often than it is not. Considerable research was gathered to define the best resource allocation model for establishing a formal RIT. The internal and external questionnaire gathered data on what unit type was best and if dispatching a unit as a RIT apparatus was preferred. The external questionnaire provided insight in what other departments were doing to staff a formal RIT. Dispatching a unit for the purpose of staffing a RIT is an option that is popular with many cities. The external questionnaire found that 56.83% of departments that responded dispatched a unit for the staffing of a RIT. How and when departments were dispatching this unit differed in several ways and provided no clear practice or new ideas. The largest single group represented were from departments that did not dispatch a unit for the specific reason of RIT. This group garnered 43.18% of the total responses and when combined with the 59.42% of the responses from the VBFD internal questionnaire that are not in favor of pre-assigning units as a RIT apparatus, it provides a strong argument to abandoning this idea for consideration as a key concept for procedural consideration in the VBFD.

This applied research project compiled considerable research and information on the effectiveness, functions, and responsibilities of RIT on the fire ground. NFPA 1710 (2016) recommends that RIT be made up of one officer and three firefighters. The external questionnaire found that 27.27% of the respondents indicated that departments minimum staffing was four person RIT. Three person minimum staffing received 38.64% of the responses from the external questionnaire and was the largest group represented. Although this is the largest group response it does not indicate the best practice. Don Abbott's (2015) research found by reviewing 1371 real life mayday situations that four person staffing of RIT should be considered as a minimum. The implementation of a four person RIT as a requirement has effects on minimum staffing of apparatus as well as unit selection of RIT on the fire ground. Currently not

all fire apparatuses in the VBFD require a minimum four person staffing. Some apparatuses allow for three person staffing and would necessitate the combination of crew members on the fire scene or not using that apparatus as a RIT in order to adhere to four person minimum RIT. The practical application of Don Abbott's (2015) research does not indicate that three person RIT is better than none and his research stresses that four person RIT is a minimum and often it will take considerable more resources to make a firefighter rescue.

Positioning of RIT can be a function of policy or an on scene operator. Although both considerations have their benefits, this research study found that 70.1% of the departments that responded afforded this decision to on scene operators. Support of the incident commander and the RIT leader as delegators of RIT positioning were almost equally favored. This data reinforces the importance of having qualified decision makers on the fire ground and supports the idea that departments favor making decisions from information gathered from the scene as opposed to legislating practical solutions from a policy perspective.

Ensuring that the correct RIT equipment is available can be dependent on the type of situation a RIT is facing. The VBFD internal questionnaire found that most respondents felt that a RIT SOP should include minimum equipment requirements. This applied research project found that although situations may vary and special equipment may be needed in certain circumstances, there is a minimum tool cache that should be considered by RITs. The external questionnaire found the five tools that were most commonly considered as a minimum requirement for RIT were an auxiliary air supply, radio, thermal imaging camera, flashlight, and a search rope. NFPA 1407 (2015) recommended in its sample SOP radio, auxiliary air supply, rescue rope kit and tools that are incident specific as its minimum consideration of tools required for RIT. Don Abbott's (2015) research coincides with these findings and stresses the importance

of getting breathable air to the down or trapped firefighter and recognizes deploying an auxiliary air supply as an important function of a RIT.

A fundamental consideration for RIT is whether the team can engage in proactive activities while assigned to RIT or are departments requiring that RIT become a reactionary force only utilized when assigned to rescue operations. NFPA 1561 (2014) delineates an IRIT from a RIT by clarifying that an IRIT is permitted to have a member involved in other activities on the fire ground as long as those other duties are not essential fire operations. The external questionnaire found that 85.06% of the responses allowed RITs to engage in ancillary duties as long as the ancillary duty did not inhibit the team from conducting a rescue attempt. At the surface these ideas seem to be in contradiction, however, NFPA 1561 (2014) indicated that a member of the IRIT could be engaged in an ancillary activity. Allowing one member of a team to become engaged in an ancillary activity indicates that an IRIT has a lesser commitment to each other in comparison to a dedicated RIT that together were doing activities that were preventative measures to help with firefighter safety outside of an IDLH. The goal of RIT is to provide a level of safety to crews operating inside an IDLH. The purpose of allowing RIT to engage in ancillary activities is to use the team as a proactive force for firefighter safety. Defining what type of activities would be allowed would need further research; however, consideration must include activities such as the placement of ground ladders, walk arounds of the buildings, and forcing of doors to allow quick exits.

The rescuing of a down firefighter is a fundamental purpose of RIT, but how a RIT is implemented can play an important role in the success of a rescue operation. According to Don Abbott (2015) the average time it takes to rescue a firefighter is 19 minutes. Abbott (2015) also found that the best source of help for firefighters comes from self-rescue and crews operating

near or with the firefighter in trouble. This research does not negate the importance of a well-trained, well prepared RIT, but rather stresses the importance of training all firefighters in self-rescue and firefighter rescue techniques. Using internal crews close to the problem to help with firefighter rescue is a practical solution that has downstream effects on resource and crew allocation. The Phoenix Fire Department (2014) has designed an inside out approach to resource allocation and firefighter rescue, utilizing an “On Deck” crew staged outside the IDLH. This crew is positioned to reinforce firefighter activities and is assigned to evolving needs on the fire ground (Phoenix Fire Department, 2005). A Mayday incident would be considered an immediate fire ground need and would cause incident commanders to dedicate resources towards fixing the problem. Using Don Abbott’s (2015) research, the incident commander would use crews close to the problem first while moving staged resource like the RIT or “On Deck” crews towards the problem. Recognizing that the best case of success is found inside the building, RIT or “On Deck” crews may be redirected to assume activities that are needed to support crews closer to the problem. “On Deck” is focused on the work cycle of crews and stresses the importance of always having a tactical reserve in position to handle fire ground needs (Phoenix Fire Department, 2005). The “On Deck” model is not taught or currently practiced in the VBFD. The internal questionnaire found that 65.85% of the respondents considered themselves familiar with the utilization of “On Deck” crews for a tactical reserve and implementation of it was favored by a two to one margin. The consideration of incorporating the “On Deck” resource allocation model as a RIT alternative does not contradict any law, standard, or regulation reviewed or included in this applied research project. In order to implement a similar model for the VBFD, additional discussion and research would be required. An in-depth training program would need to be created that focuses on educating the more than 34% of the department that is

currently not familiar with the model while also ensuring that all VBFD members understand that the model focuses on resources and utilization of crews nearest to the problem.

Legal consideration examined by this applied research project provided clarification on the protections and responsibilities of employees and employers in regard to RIT policies and regulations. Considerable research was conducted to understand the implications of NFPA standards. NFPA represents industry best practices and does not carry the weight of law as opposed to Virginia's acceptance of OSHA and its far reaching regulations (Smith, 2017). State laws represent the biggest challenge in understanding how organizations need to govern and administer policies. In the City of Virginia Beach the best course of action in creating a RIT policy is to follow Virginia OSHA regulations and adhere closely to NFPA standards (Smith, 2017). The literature review defined what OSHA's regulations on two-in/two-out entailed and what NFPA standards effect RIT application. The legal research indicated how important adhering to policy and fostering a culture that supports the understanding and implementation of regulatory compliance is to the employee and employer. OSHA does not mention RIT by name and only provides legal regulations centered around two-in/two-out (Occupational Safety and Health Administration, 2012). The VBFD's Tactical guidelines SOP FS 5.02.SOP (2015) does provide the legal language that supports OSHA regulations, but does not provide the guidance that standards from NFPA recommend for RIT.

### **Recommendations**

This applied research project addressed the problem of identifying key rapid intervention concepts for inclusion in an operating guideline for the Virginia Beach Fire Department. The VBFD does not currently have a detailed SOP that addresses RIT needs and instead has included some aspects of rapid intervention procedures in separate guidelines. The identification of

critical rapid intervention procedures and practices is an integral part to a comprehensive RIT program and will ultimately increase firefighter safety. The recommendations identified in this applied research project focus on identifying the concepts that will provide the VBFD with tools to better prepare, mitigate and enforce effective RIT practices.

Virginia Beach Fire Chief David Hutcheson (2016), several NFPA standards and almost 60% of the VBFD members agree that an SOP is needed to address RIT activities. This applied research project recommends that a new comprehensive SOP be written and aspects of RIT procedures that are outlined in other SOPs be removed. A clear and consistent procedure needs to be compliant with OSHA regulations and support NFPA standards, VBFD policy, and practice. This applied research project recommends that in addition to including some of the following key elements it also enlists the help of the city attorney's office to review the finished document to ensure the SOP is in line with all legal recommendations.

This applied research project recommends that a comprehensive RIT policy reinforce and define the use of an IRIT before making entry into an IDLH. As noted, there is current terminology in the existing SOPs that supports practices compliant with OSHA and NFPA; however, the radio review brought some doubt that VBFD practical application has been in total alignment with policy and NFPA standards. The policy on two-in/two-out are clearly spelled out in an existing VBFD SOP. More research is needed to determine if the policy is not being followed and if NFPA guidelines are not being met; however, the creating of a comprehensive SOP on RIT will provide an opportunity to train and educate the department on the new procedures and redefine departmental expectations. This research project recommends that the department require an IRIT be on scene and be designated over the radio before allowing crews to enter an IDLH. The only exception to this is when there is a credible possibility for a rescue

and only after this has been communicated over the radio. Members of the VBFD need to understand that adherence to two-in/two-out is a legal responsibility and failure to follow could result in legal ramifications.

Defining how RIT is to be staffed is a key element of any RIT SOP. This applied research project did not find a clear benefit or best practice on if it was better to predestinate a RIT apparatus at the time of dispatch. The majority VBFD membership were not in favor of pre-assigning units as a RIT. Since there was no evidence to support the reassigning of units and the department members are not in favor, the recommendation is that the policy not include the practice of pre-assigning RIT in any configuration.

Research was found to support the requirement of four person staffing for RIT. Four person staffing was considered as a minimum for Don Abbott (2015) and the Mayday Project. The strong research and case study that was done by Abbott (2015) brings credibility to the recommendation that four person RIT is a must. This applied research project identifies that four person RIT is a key factor in the success of RIT and strongly recommends that it become the minimum consideration for RIT creation and policy development.

The idea behind using RIT is to provide a level of safety for crews operating inside of an IDLH environment. Proper tool selection, on scene activities, and the positioning of RIT are fundamental considerations in defining the responsibilities of RIT. This applied research project identified auxiliary air supply, radio, thermal imaging camera, flashlight, search rope and incident specific hand tools as the minimum tool requirements for RIT. Using RIT to do proactive activities as long as they do not interfere in a rescue effort was a common practice and was permissible with NFPA. The applied research project did not attempt to define all activities that would be allowed but recommends that dedicated RITs be allowed to engage in activities

that do not inhibit them from conducting a rescue operation either because of the nature of the activity or because of its geographical location. These activities should add to the overall safety of crews operating on the fire scene. The positioning of RIT can play an important part of a rescue operations. This applied research project found that on scene decision makers were favored in making the decision on where RIT would position. The recommendation is that the RIT leader position in an advantageous area and then confirm the location through command. This gives RIT leaders the authority to initially position crews but ultimately makes the incident command responsible for the overall scene safety and give them the information needed for accountability reasons.

The following recommendation needs to be researched further to evaluate its effects on practical application before consideration for adoption as policy. The “On Deck” model for rapid intervention is not currently accepted in the Vbfd. Although elements of its use are supported by the latest research from Don Abbott (2015), making a case for its adoption was outside the scope of this applied research project. The application and acceptance of “On Deck” requires more research; however, this applied research project recommends that further inquiry be completed with the focus of how it helps with the practical application of the regulations and standards outlined in this project.

Although not an intended finding or source of inquiry for this applied research project, it is important to note that there appears to be a lack of compliance in regard to current department regulations and applications. Currently, the department is functioning under the assumption that its members are operating in a compliant manner; however, the research suggests differently. The questionnaires noted a majority of the department feels that its members are working within the intended scope of practice and regulations; however, this in conflict with the radio

transmission analyses. As a result, an incidental recommendation from this project would be the development of a compliance regulatory committee whose purpose is to review working fires for compliance in current practices. It is recommended that a process be developed to review working fires as a training tool to highlight accepted practices and provide a benchmark for future evaluation and future research. This type of committee and the information it can disseminate will allow for more real-time feedback as well as help to identify gaps in practice and provide recommendations for improvement.

The last recommendations are for researchers wishing to replicate or build upon this applied research project. Special consideration needs to be placed on state legislation and possible changes in regulations or standards. Researchers could improve on this project by involving larger sample sizes for both questionnaires as well as increasing the number of interviewees for the interview portion. In regard to analysis of radio transmissions, a larger sample size should be encouraged.

### References

- Abbott, D. (2015). *2015 Annual "Project Mayday" General Report*. Retrieved from Project Mayday: [http://projectmayday.net/public/res/pdf/2015MaydayProject\\_Career.pdf](http://projectmayday.net/public/res/pdf/2015MaydayProject_Career.pdf)
- About the Virginia Beach Fire Department*. (2016). Retrieved from vbgov.com: <https://www.vbgov.com/government/departments/fire/aboutus/Pages/default.aspx>
- Feinman, J. M. (2000). *Law 101; Everything you need to know about the American legal system*. New York, NY: Oxford University Press.
- Goode, S., & Altimari, D. (2016, December 14). *Family of hartford firefighter killed in blaze settles lawsuit against city*. Retrieved from Hartford Courant: <http://www.courant.com/news/connecticut/hc-hartford-kevin-bell-suit-settled-1215-20161213-story.html>
- Hall, S. (2016). *Virginia Beach Community Profile 2015-2016*. Virginia Beach, VA: Inside Business.
- Hargarten, D. J. (1999, January 1). *Complying with OSHAS revised respiratory protection standard*. Retrieved from Fire Engineering: <http://www.fireengineering.com/articles/print/volume-152/issue-1/departments/fire-commentary/complying-with-oshas-revised-respiratory-protection-standard.html>
- Haynes, H. J., & Molis, J. L. (2017). *United States Firefighter Injuries- 2016*. Quincy, MA.: National Fire Protection Association.
- Hutcheson, D. W. (2016). Operational Huddle for Battalion Chiefs VBFD. *RIT Discussion*. Virginia Beach , VA.

- National Fire Protection Association. (2013). *NFPA 1500 standard on fire department occupational safety and health program*. Quincy, MA: Author.
- National Fire Protection Association. (2014). *NFPA 1561 emergency services incident management system and command safety*. Quincy, MA: Author.
- National Fire Protection Association. (2015). *NFPA 1407 standard for training fire service rapid intervention crews*. Quincy, Ma: Author.
- National fire Protection Association. (2015). *NFPA 1521 standard for fire department occupational safety and health*. Quincy, MA: Author.
- National Fire Protection Association. (2016). *NFPA 1710 standard for organization and deployment of fire suppressions operations, emergency medical operations, and special operations to the public by career fire departments*. Quincy, MA: Author.
- Occupational Safety and Health Administration. (2012, August). *29 Code of Federal Regulations 1910.134 (g) (4) Respiratory Protection*. Retrieved from U.S. Government Publishing Office: [https://www.ecfr.gov/cgi-bin/text-idx?SID=a67f0d8697a51a02f161598c2dd0d479&mc=true&node=se29.5.1910\\_1134&rgn=div8](https://www.ecfr.gov/cgi-bin/text-idx?SID=a67f0d8697a51a02f161598c2dd0d479&mc=true&node=se29.5.1910_1134&rgn=div8)
- Phoenix Fire Department. (2005, June). *In-transit, on deck, company recycle*. Retrieved from Phoenix regional Standard Operating Procedures: <https://www.phoenix.gov/firesite/Documents/074683.pdf>
- Phoenix Fire Department. (2014, Febuary). *Mayday readiness and response*. Retrieved from Phoenix Regional Standard Operating Procedures: <https://www.phoenix.gov/firesite/Documents/20101b.pdf>

Saltzman, W. (2015, March 11). *Family seeks criminal charges in death of fallen firefighter.*

Retrieved from 6 ABC Action News WPVI-TV : <http://6abc.com/news/fallen-firefighters-family-seeks-criminal-charges/552799/>

Smith, M. A. (2017, September 28). Virginia Beach Senior City Attorney. (E. Wilkerson, Interviewer)

United States Fire Administration. (2014). *Strategic Plan Fiscal Years 2014-2018*. Retrieved from [usfa.fema.gov](http://usfa.fema.gov):

[https://www.usfa.gov/downloads/pdf/publications/strategic\\_plan\\_2014-2018.pdf](https://www.usfa.gov/downloads/pdf/publications/strategic_plan_2014-2018.pdf)

United States Fire Administration. (2016, September). *Executive development-student manual (6th ed.)*. Retrieved from [nfa.usfa.fema.gov](http://nfa.usfa.fema.gov): <https://nfa.fema.gov/ax/sm/sm-r0123.pdf>

Varone, C. (2015, November 2). *LODD widow claims Georgia fire responsible for wrongful death*. Retrieved from Fire Law blog: <http://www.firelawblog.com/2015/11/02/lodd-widow-claims-georgia-fire-chief-responsible-for-wrongful-death/>

Virginia Beach Fire Department. (2015, December 29). Tactical guidelines SOP FS 5.02.

Virginia Beach, VA: Author.

Virginia Beach Fire Department. (2016, February 28). Communications SOP FS 5.38. Virginia Beach, VA: Author.

## Appendix A

**VBFD RIT Questionnaire**

1. In your opinion does the VBFD need any of the following? You can pick more than one.

- SOP on Rapid Intervention
- SOP on 2 in 2 out
- RIT procedural manual
- RIT training manual

2. Are you confident in your understanding of the rules outlined in VBFD policies, NFPA standards and the Code of federal regulations that govern 2 in 2 out?

- Yes
- No

3. Are you confident in your understanding of the rules outlined in VBFD policies, NFPA standards and the Code of Federal regulations that govern Rapid Intervention Teams?

- Yes
- No

4. In your opinion is the VBFD currently following the NFPA and OSHA in regard to the 2 in 2 out standard?

- Yes
- No
- I don't know

5. In your opinion is the VBFD currently following the NFPA and OSHA in regard to Rapid intervention team standards?

- Yes
- No
- I don't know

6. In your opinion how is the first arriving Engine Captain most often meeting the 2 in 2 out requirements?

- Leaving two members of the initial Engine outside while two more make entry
- Use the members of the next Engine company or apparatus
- The VBFD operates under the presumption that all buildings are occupied and therefore 2 in 2 out does not apply
- The requirements of 2 in 2 out are not being met
- Other: please explain

7. What should be included in a RIT SOP? You can pick more than one.

- How the VBFD will address 2 in 2 out requirements
- When to call a Mayday
- How to call a Mayday
- Roles and actions of the member calling the Mayday
- Size of a Rapid Intervention Team
- When RIT should be used (assigned during the incident)
- When RIT should be activated
- Positions, roles, and assignments of a Rapid Intervention Team
- Responsibilities/functions of the Rapid Intervention Team
- Positioning of the Rapid Intervention Team
- Responsibilities of Incident Commander
- Incident Command Check list
- Procedures for larger scale incidents
- Minimum equipment needs for Rapid Intervention Team
- Additional ideas and concepts

8. How many times in the last year have you participated in some kind of Rapid Intervention Team (RIT) drill?

- 0
- 1-2
- 3-4
- 5-6
- 6+

9. Are you familiar with the “On Deck” model and using “On Deck” crews as a tactical reserve for back up for additional personnel on structure fires?

- Yes
- No

10. Would you support using “On Deck” crews for traditional RIT functions or be assigned to other tactical fire ground duties?

- I am not familiar enough with “On Deck” to make an informed decision
- Yes
- No

11. Would you like to see the VBFD move to a pre-designated RIT apparatus that is dispatched as the “RIT Truck” at the time of alarm?

- Yes
- No

12. In your opinion do you believe that the VBFD is staying up to date with industry best practices and adapting to recent lessons learned, research, and incident review with regard to RIT operations? If not please explain what needs to be done

- Yes
- No: please explain

13. What is your current rank?

- Firefighter (or FF/Medic)
- Master Firefighter (or MFF/Medic)
- Captain
- Chief Officer

## Appendix B

**External RIT Questionnaire**

1. Please provide the name of your Department?
2. Is your Department?
  - Career
  - Volunteer
  - Mixed
3. How big is your department? (Uniform Staff)
  - 0-50
  - 51-100
  - 101-200
  - 201-400
  - 401-600
  - 601 or more
4. What is the estimated population of the community your department serves?
  - Less 100,000
  - 100,001-300,000
  - 300,001-500,000
  - 500,001-700,000
  - 700,000 or greater
5. What term does your department use to designate a rapid intervention team?
  - RIT: Rapid Intervention Team
  - RIC: Rapid Intervention Crew
  - FAST
  - On Deck
  - Other (please specify)
6. Does your organization have a Rapid Intervention policy?
  - Yes
  - No
7. If yes, does your department's Rapid Intervention policy include requirements to establishing or adhering to the 2 in 2 out standards outlined in OSHA and NFPA?
  - Yes
  - No
  - N/A
8. Does your Department count the driver of an apparatus or the initial incident commander towards the 2 in 2 out standard?

- Yes
- No
- I don't know

9. What is your minimum staffing for a Rapid Intervention Team?

- 2 person team
- 3 person team
- 4 person team
- 5 or more person team
- N/A

10. What type of apparatus do you allow to form a Rapid Intervention Team? Pick more than one if it applies.

- Engine
- Ladder truck
- Rescue
- Ambulance
- Tanker
- Other (please specify)

11. Does your Department provide additional Rapid Intervention training to its members?

- Yes
- No

12. What equipment is considered to be the minimum for a Rapid Intervention Team? Select all that apply.

- Extra SCBA, RIT Bag, or auxiliary air supply
- HALEGUN
- Axe
- Search rope or tag line
- Stokes basket
- Radio
- Flashlight
- Thermal imaging camera
- Power tools
- EMS equipment
- Hose line
- Ground ladders
- Other (please specify)

13. How often in the last year have you done a Mayday or Rapid intervention Drill?

- 0
- 1-2
- 2-3
- 3-4

- 5-6
- 6 or more times

14. Does your department use the “On Deck” model to staff or meet your Rapid Intervention requirements?

- Never heard of “On Deck”
- Considered it but decided not too
- Are considering transitioning to “On Deck”
- Have used it and have transitioned away from using it
- Are currently using “On Deck”

15. Does your Department currently dispatch or pre-designate a fire apparatus as a Rapid Intervention Team as part of the run order?

If so what apparatus?

- No
- Yes second apparatus (Engine, Ladder, or Rescue)
- Yes third apparatus (Engine, Ladder, or Rescue)
- Yes fourth apparatus (Engine, Ladder, or Rescue)
- Yes fifth apparatus (Engine, Ladder, or Rescue)
- Other (please specify)

16. Once a Rapid Intervention Team is established and after they have assembled all required tools where do they stage?

- At the front of the building per standing operating procedures
- At the assigned area as determined by the Incident Commander
- The Rapid Intervention Team leader positions the team where they see fit
- The Rapid Intervention Team leader positions the team where the incident commander can see the crew
- Other (please specify)

17. Once a Rapid intervention Team has been established are they allowed to do ancillary tasks proactively that would help with firefighter rescue if needed? For example, removing bars off window, as long as it does not stop them from doing their RIT functions?

- No ancillary activities are permitted
- Ancillary activities are allowed as long as they can immediately be stopped and assuming stopping the activity will not have an adverse effect on firefighting operations
- Other (please specify)

18. If you are willing to share your department's SOP/SOG please provide an email contact below.

| <b># Departments included</b>                   | <b>Date of Response</b> |
|---|-------------------------|
| 1 City of Bremerton Fire Department             | 8/28/2017 6:49 PM       |
| 2 De Pere Fire & Rescue                         | 8/22/2017 8:57 AM       |
| 3 Gwinnett County Fire and Emergency Services   | 8/22/2017 7:38 AM       |
| 4 Chesapeake Fire                               | 8/21/2017 7:33 PM       |
| 5 Columbus (OH) Div or Fire                     | 8/21/2017 1:20 PM       |
| 6 Green Country Fire and Rescue                 | 8/21/2017 12:02 PM      |
| 7 Las Vegas Fire & Rescue                       | 8/21/2017 11:29 AM      |
| 8 Norfolk Fire-Rescue                           | 8/15/2017 8:39 PM       |
| 9 Monrovia Fire & Rescue                        | 8/14/2017 9:40 PM       |
| 10 James City County Fire Department            | 8/14/2017 3:36 PM       |
| 11 Atlanta Fire Rescue                          | 8/12/2017 9:30 AM       |
| 12 Novato Fire Protection District              | 8/11/2017 10:45 AM      |
| 13 City of Manassas Park Fire Rescue Department | 8/11/2017 7:40 AM       |
| 14 San Ramon Valley Fire                        | 8/9/2017 9:08 PM        |
| 15 City of Maplewood                            | 8/9/2017 5:04 PM        |
| 16 Glendale, AZ Fire Department                 | 8/9/2017 4:17 PM        |
| 17 Gwinnett Fire and Emergency Services, Ga     | 8/8/2017 9:25 PM        |
| 18 Glenwood Springs Fire Department             | 8/8/2017 8:51 PM        |
| 19 Swift Current Fire Department                | 8/8/2017 9:24 AM        |
| 20 Brampton                                     | 8/8/2017 8:20 AM        |
| 21 Bristol Kendall Fire Protection District     | 8/7/2017 3:51 PM        |
| 22 Sioux Falls Fire Rescue                      | 8/7/2017 3:48 PM        |

|  |                   |
|--|-------------------|
| 23 Town of Fond du Lac                   | 8/7/2017 2:51 PM  |
| 24 Telluride Fire Protection District    | 8/7/2017 2:25 PM  |
| 25 Ventura County Fire District          | 8/7/2017 1:41 PM  |
| 26 Flat Rock Fire Department             | 8/7/2017 1:03 PM  |
| 27 Tualatin Valley Fire & Rescue         | 8/7/2017 12:06 PM |
| 28 City of Asheville, NC Fire Department | 8/7/2017 11:55 AM |
| 29 Payson Fire Department                | 8/7/2017 11:08 AM |
| 30 Central Pierce Fire and Rescue        | 8/7/2017 10:27 AM |
| 31 Berwyn Fire Department                | 8/7/2017 10:23 AM |
| 32 Clark County Fire District 6          | 8/7/2017 9:52 AM  |
| 33 Foc Crossing Fire Department          | 8/7/2017 9:52 AM  |
| 34 Norfolk Fire Department               | 8/7/2017 9:24 AM  |
| 35 Powhatan County Fire & Rescue         | 8/7/2017 9:22 AM  |
| 36 Sioux City Fire Rescue                | 8/7/2017 8:23 AM  |
| 37 Columbus (MS) Fire and Rescue         | 8/7/2017 8:20 AM  |
| 38 North Vernon Fire Department          | 8/7/2017 8:14 AM  |
| 39 Newport News Fire Department          | 8/7/2017 8:12 AM  |
| 40 Lebanon Fire-EMS                      | 8/7/2017 7:31 AM  |
| 41 Henrico County Division of Fire       | 8/7/2017 7:13 AM  |
| 42 Fort Pickett Fire & Rescue            | 8/6/2017 10:24 PM |
| 43 Prince George's County MD             | 8/6/2017 9:51 PM  |
| 44 Wisconsin Rapids Fire Department      | 8/6/2017 5:13 PM  |
| 45 Redmond WA Fire Department            | 8/6/2017 3:34 PM  |

|   |                   |
|---|-------------------|
| 46 Smithfield Fire Department                 | 8/6/2017 3:17 PM  |
| 47 Seattle Washington                         | 8/6/2017 12:03 PM |
| 48 Norfolk, Va. Fire-Rescue                   | 8/6/2017 9:50 AM  |
| 49 Memphis Fire Department                    | 8/6/2017 9:08 AM  |
| 50 Stamford                                   | 8/5/2017 5:28 PM  |
| 51 Castle Rock Fire and Rescue Department     | 8/5/2017 4:51 PM  |
| 52 Apple Valley                               | 8/5/2017 4:49 PM  |
| 53 Gurnee Fire Department                     | 8/5/2017 3:55 PM  |
| 54 Tulsa Fire department                      | 8/5/2017 3:49 PM  |
| 55 Albany New York                            | 8/5/2017 3:40 PM  |
| 56 Colorado City Fire Department              | 8/5/2017 3:25 PM  |
| 57 Clay Fire Territory                        | 8/5/2017 3:18 PM  |
| 58 Oley Fire Co.                              | 8/5/2017 3:00 PM  |
| 59 Burlington Fire Department (MA)            | 8/5/2017 2:18 PM  |
| 60 Red, White & Blue Fire Protection District | 8/5/2017 1:22 PM  |
| 61 Manchester Fire -Rescue                    | 8/5/2017 1:10 PM  |
| 62 Fargo Fire Department                      | 8/5/2017 12:35 PM |
| 63 Roanoke Fire-EMS                           | 8/5/2017 12:35 PM |
| 64 Rogers, AR Fire Department                 | 8/5/2017 12:21 PM |
| 65 Derry Fire Dept.                           | 8/5/2017 12:20 PM |
| 66 Indianapolis Fire Department               | 8/5/2017 12:19 PM |
| 67 Keller Fire Rescue                         | 8/5/2017 12:15 PM |
| 68 Fairfax County Fire and Rescue Department  | 8/5/2017 10:48 AM |

|   |                   |
|---|-------------------|
| 69 Poudre Fire Authority                              | 8/5/2017 10:10 AM |
| 70 Fond du Lac Fire Rescue                            | 8/4/2017 4:29 PM  |
| 71 Fairfax County Fire and Rescue                     | 8/4/2017 3:58 PM  |
| 72 Plano Fire-Rescue                                  | 8/4/2017 2:47 PM  |
| 73 Morgan County Fire Rescue                          | 8/4/2017 2:20 PM  |
| 74 Gilt Edge Volunteer Fire Department                | 8/4/2017 2:11 PM  |
| 75 City of York Department of Fire/Rescue Services    | 8/4/2017 2:06 PM  |
| 76 Lealman Fire District                              | 8/4/2017 1:58 PM  |
| 77 City of Bend Fire Dept                             | 8/4/2017 1:55 PM  |
| 78 Prince Georges County Fire EMS Department          | 8/4/2017 1:53 PM  |
| 79 Howard County Department of Fire & Rescue Services | 8/4/2017 1:28 PM  |
| 80 Williamsport Fire - EMS Inc                        | 8/4/2017 1:21 PM  |
| 81 Toronto  | 8/4/2017 1:19 PM  |
| 82 Travis County ESD #2                               | 8/4/2017 1:01 PM  |
| 83 Ventura County Fire                                | 8/4/2017 12:24 PM |
| 84 City of Green Fire Division                        | 8/4/2017 12:09 PM |
| 85 Fairfax County Fire & Rescue Dept.                 | 8/4/2017 12:05 PM |
| 86 Charlottesville Fire Department                    | 8/4/2017 11:57 AM |

## Appendix C

## Radio Research Compiled from Working Fires

| <b>Incident #</b> | <b>2 in 2 out Need</b> | <b>Was Building Occupied?</b> | <b>Initial Tactics</b>                   | <b>Type of Structure</b> | <b>RIT established</b> |
|-------------------|------------------------|-------------------------------|--|--------------------------|------------------------|
| 2015016957        | Not Communicated       | Not Communicated              | Defensive/<br>Offensive                  | Multi Family             | Yes Before Entry       |
| 201500055         | Not Communicated       | Not Communicated              | Offensive                                | Multi Family             | Yes After Entry        |
| 2015006435        | Not Communicated       | Possibly Occupied Communicate | Transitional/<br>Offensive/<br>Defensive | Multi Family             | Yes After Entry        |
| 2015006894        | Not Communicated       | Possibly Occupied Communicate | Transitional/<br>Offensive               | Single Family            | Not Heard on Radio     |
| 2015008749        | Not Communicated       | All Clear Communicated        | Investigating/<br>Offensive              | Single Family            | Yes After Entry        |
| 2015021118        | Not Communicated       | All Clear Communicated        | Defensive/<br>Offensive                  | Multi Family             | Yes After Fire Control |
| 2015031746        | Not Communicated       | Not Communicated              | Offensive                                | Multi Family             | Yes After Entry        |
| 2016006739        | Not Communicated       | Possibly Occupied Communicate | VIS/Offensive                            | Single Family            | Yes After Rescue       |
| 2015033083        | Not Communicated       | Not Communicated              | Offensive                                | Single Family            | Yes After Entry        |
| 20170510          | Not Communicated       | Not Communicated              | Investigating/<br>Offensive              | Single Family            | Not Heard on Radio     |
| 2016011873        | Not Communicated       | All Clear Communicated        | Transitional/<br>Offensive               | Single Family            | Yes After Fire Control |
| 2016007041        | Not Communicated       | Possibly Occupied Communicate | Defensive/Offensive                      | Multi Family             | Yes Before Entry       |
| 2016011873        | Not Communicated       | All Clear Communicated        | Transitional/<br>Offensive               | Single Family            | Not Heard on Radio     |
| 2015052591        | Not Communicated       | Not Communicated              | Defensive/<br>Offensive                  | Single Family            | Yes Before Entry       |
| 2015051369        | Not Communicated       | Not Communicated              | Offensive                                | Single Family            | Yes After Entry        |
| 2016003973        | Not Communicated       | Not Communicated              | Offensive                                | Single Family            | Not Heard on Radio     |

|            |                  |                               |                             |               |                        |
|------------|------------------|-------------------------------|-----------------------------|---------------|------------------------|
| 2016020049 | Not Communicated | Not Communicated              | Offensive                   | Single Family | Yes After Entry        |
| 2015028366 | Not Communicated | Not Communicated              | Offensive                   | Single Family | Yes After Fire Control |
| 2016030941 | Not Communicated | Not Communicated              | Defensive/Offensive         | Commercial    | Not Heard on Radio     |
| 2016021383 | Not Communicated | All Clear Communicated        | Offensive                   | Single Family | Yes After Entry        |
| 2015023881 | Not Communicated | All Clear Communicated        | Offensive                   | Commercial    | Yes After Entry        |
| 2016001699 | Not Communicated | Not Communicated              | Offensive                   | Single Family | Yes After Fire Control |
| 2016012753 | Not Communicated | Not Communicated              | Offensive                   | Single Family | Yes Before Entry       |
| 2016047512 | Not Communicated | Possibly Occupied Communicate | Offensive                   | Single Family | Not Heard on Radio     |
| 2016058648 | Not Communicated | Not Communicated              | Offensive                   | Multi Family  | Yes After Entry        |
| 2016051778 | Not Communicated | All Clear Communicated        | Offensive                   | Single Family | Yes After Entry        |
| 2015037105 | Not Communicated | Not Communicated              | Offensive/Defensive         | Multi Family  | Yes After Entry        |
| 2016052281 | Not Communicated | All Clear Communicated        | Defensive/Offensive         | Single Family | Yes Before Entry       |
| 2015051426 | Not Communicated | N/A                           | Defensive/Offensive         | Commercial    | Yes Before Entry       |
| 2017020494 | Not Communicated | N/A                           | Defensive/Checking Interior | Multi Family  | Yes Before Entry       |
| 2017025723 | Not Communicated | All Clear Communicated        | Transitional/Offensive      | Single Family | Not Heard on Radio     |
| 2017019961 | Not Communicated | All Clear Communicated        | Investigating/Offensive     | Single Family | Not Heard on Radio     |
| 2017029120 | Not Communicated | Not Communicated              | Defensive                   | Commercial    | Yes Before Entry       |
| 2017006279 | Not Communicated | Not Communicated              | Transitional/Offensive      | Multi Family  | Not Heard on Radio     |
| 2017001698 | Not Communicated | Not Communicated              | Transitional/Offensive      | Single Family | Yes After Entry        |

|            |                  |                               |                          |                  |                        |
|------------|------------------|-------------------------------|--------------------------|------------------|------------------------|
| 2017002491 | Not Communicated | Not Communicated              | Offensive                | Multi Family     | Not Heard on Radio     |
| 2017003463 | Not Communicated | Possibly Occupied Communicate | Transitional/ Offensive  | Not Communicated | Yes After Entry        |
| 2017003439 | Not Communicated | Not Communicated              | Offensive                | Single Family    | Yes After Entry        |
| 2017004111 | Not Communicated | Not Communicated              | Offensive                | Not Communicated | Yes After Entry        |
| 2017005223 | Not Communicated | Possibly Occupied Communicate | Offensive                | Multi Family     | Not Heard on Radio     |
| 2017005362 | Not Communicated | Possibly Occupied Communicate | Offensive                | Single Family    | Yes After Entry        |
| 2017007144 | Not Communicated | Not Communicated              | Offensive                | Single Family    | Yes After Fire Control |
| 2017011242 | Not Communicated | Not Communicated              | Offensive                | Single Family    | Yes After Entry        |
| 2017012652 | Not Communicated | Not Communicated              | Offensive                | Multi Family     | Not Heard on Radio     |
| 2017012949 | Not Communicated | All Clear Communicated        | Offensive                | Single Family    | Not Heard on Radio     |
| 2017013580 | Not Communicated | All Clear Communicated        | Offensive                | Single Family    | Yes After Entry        |
| 2017016172 | Not Communicated | Not Communicated              | Offensive Victim found   | Single Family    | Not Heard on Radio     |
| 2017017633 | Not Communicated | Not Communicated              | Investigation/ Offensive | Townhouse        | Not Heard on Radio     |
| 2017019961 | Not Communicated | All Clear Communicated        | Offensive                | Single Family    | Not Heard on Radio     |
| 2017020730 | Not Communicated | Evacuation in progress        | Investigate/ Offensive   | Commercial       | Yes After Fire Control |
| 2017021150 | Not Communicated | Not Communicated              | Offensive                | Townhouse        | Yes Before Entry       |
| 2017022748 | Not Communicated | All Clear Communicated        | Transitional/ Offensive  | Single Family    | Yes Before Entry       |
| 2017024593 | Not Communicated | Not Communicated              | Defensive                | Single Family    | Not Heard on Radio     |

|            |                  |                               |           |               |                    |
|------------|------------------|-------------------------------|-----------|---------------|--------------------|
| 2017025975 | Not Communicated | Possibly Occupied Communicate | Offensive | Single Family | Not Heard on Radio |
| 2017027228 | Not Communicated | Not Communicated              | Offensive | Single Family | Not Heard on Radio |
| 2017030291 | Not Communicated | Not Communicated              | Offensive | Single Family | Not Heard on Radio |
| 2017030918 | Not Communicated | Not Communicated              | Offensive | Single Family | Yes After Entry    |

## Appendix D

## Interview Questions Addressing Legal Considerations in regards to RIT

1. What is your name and title?
2. How long have you been working in the legal field?
3. In your current position, do you serve as a legal adviser to departments within the city of Virginia Beach, like the Virginia Beach Fire Department, on legal matters that effect Safety of its employees and adherence to safety standards?
4. Does the National Fire Protection Agency (NFPA), a consensus standard organization, recommendations meet the definition of a Law?
5. Does the Code of Federal Regulation that is outlined in Occupational Safety and Health Administration (OSHA) 29CFR 1910.134 Respiratory Protection meet the definition of a law?
6. Does the City Attorney's Office recommend all city Departments within the city, to the best of their ability, create operating procedures that adhere to NFPA Standards and OSHA regulations?
7. What are the legal ramifications of a serious accident that happened on a fire incident where a contributing factor was the department not adhering to or not addressing NFPA or the OSHA regulations?
  - a. City level
  - b. Department head level
  - c. Incident commander of the fire scene
8. What are the legal ramifications of a serious accident that happened on a fire incident where a contributing factor was the department or department member did not follow NFPA or the OSHA regulations even in the absence of an operating procedure?
  - a. City level
  - b. Department head level
  - c. Incident commander of the fire scene
  - d. Company officer
9. What are the legal ramifications of a serious accident that happened on a fire incident where a contributing factor was the department ignoring or not adhering to NFPA or the OSHA regulations?
  - a. City level
  - b. Department head level
  - c. Incident commander of the fire scene
10. What are the legal ramifications of a serious accident that happened on a fire incident where a contributing factor was that the Incident Commander did not follow Standing Operating Procedures?
  - a. City level
  - b. Department head level
  - c. Incident commander of the fire scene

11. Under what circumstances can a city be held liable for an accident involving a firefighter on the fire scene?
12. Under what circumstances can a department head that was not on scene at the time of an accident be held liable for an accident that involved serious injury to a firefighter on a fire scene?
13. Under what circumstances could a supervisor either direct supervisor or an incident commander be held liable for a serious injury that happened on a fire scene where their decisions or inaction contributed to the situation?
14. Can a fire representative be charged criminally for their actions on a fire scene that contributed to a serious injury?
15. When writing departmental policies what outside influences effect how it is written?