Water Rescue Capability Assessment

Wilson Fire Rescue Services Water Rescue Response Capabilities

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Certification Statement

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

Signed:

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Abstract

The scope of this research project was to perform a water rescue capability assessment for Wilson Fire and Rescue Services (WFRS). The problem is the lack of a capability assessment prevents WFRS from ensuring it is prepared for water rescue events. The purpose of this descriptive research project is to conduct a water rescue capability assessment for WFRS.

During this project literature review, internal departmental research, and personal communicaitons both internal and external were used to explore the following research questions:

1. What standards are available to guide preparations for water rescue responses?
2. What federal and/or state guidelines are available for developing water rescue teams?
3. What resources are available to support and/or supplement water rescue responses in this jurisdiction?
4. What is the current level of preparedness of WFRS as compared to recognized standards?

The results of this project indicate that WFRS has limited capabilities for performing water rescue safely. This research project found documents available from the

Federal Emergency Management Agency, National Fire Protection Association, and North Carolina Association of Rescue and EMS. These were used to form a comparison basis to study the departments abilities.

Interdepartmental research was conducted to explore the equipment the department has in inventory. Internal interviews were conducted to establish the departmental vision to expand our water rescue response.

Personal communication with surrounding agencies identified other resources available to supplement our water rescue response. Limitations were identified in the standard of cover and response times for these outside agencies.

Recommdendations from this research include expanding the water rescue program. Using a multi-phase implementation process, this agency can obtain the FEMA Type II team classification by December 2011. This is a realistic and attainable goal for the organization.

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Introduction

Like many of todays fire service organziations, Wilson Fire Rescue Serivces (WFRS) is an all hazards customer service organization. The days of this organization limiting its service to simply suppression activities has long past. As an all hazards response agency we are called upon to respond to almost anything our jurisdiction can offer. We routinly respond to anything from the traditional structure fire, hazardous materials emergency, medical alarm, vehicle/transportation accident and an occasional industrial accident. Somewhere embedded in this barrage of responses lies a discipline called technical rescue that includes water rescue events. As Brian Eckelkamp commented in his article for Fire Chief magazine, Got Water?, progressive fire departments are striving to meet the needs of their community and most all communities have potential for water-related accidents (Eckelcamp, 2002). The City of Wilson is no different. The potential for water-related accidents is real.

The problem is the lack of a capability assessment prevents WFRS from ensuring it is prepared for water rescue events. The purpose of this descriptive research project is to conduct a water rescue capability assessment for WFRS.

The following research questions will be explored during the course of this descriptive research project:

1. What standards are available to guide preparations for water rescue responses?
2. What federal and/or state guidelines are available for developing water rescue teams?
3. What resources are available to support and/or supplement water rescue responses in this jurisdiction?
4. What is the current level of preparedness of WFRS as compared to recognized standards?

Background and Significance

Incorporated in 1849, the City of Wilson became the home of an estimated population of 3,500 citizens. The City is located in eastern North Carolina approximately 35 miles east of the state capital, Raleigh, NC. Wilson Fire Department began offering its service in 1858 as a volunteer organization with a simple bucket brigade response. In 1887, the organization began responding with a horse drawn steamer from a centrally located station. The organization went fully paid in 1938. In 1993, under the direction of a new fire chief, the organization embraced the reality of an all hazards agency, practicing

total risk reduction and adopted its current name, Wilson Fire and Rescue Services.

Today, the City of Wilson is home to a population of approximately 49,000 citizens encompassing 29 (+/-) square miles. The city, once primarily an agricultural town, is now home to various industry and commercial facilities with single and multi-family residential housing in the mix. The organization serves the citizens of Wilson from five (5) strategically located stations providing emergency response for a multitude of hazards. An effective response force of three (3) engines, two (2) quints, one (1) ladder, two (2) light duty squads and one (1) command officer respond to approximately 5,000 calls of service each year. Calls for medical assistance consistently attribute to 50% or more of the total calls for service. The workforce for the organization includes administrative staff, sworn, and non-sworn employees that have grown to 93 total personnel (see Appendix A).

Historically the need for a trained water rescue team was foreign to this organization. The reality of this threat came to fruition September 16, 1999 when Hurricane Floyd released a torrential rainfall on this region. Hurricane Floyd was responsible for numerous fatalities in

North Carolina. The storm caused a disaster declaration in 66 of the 100 North Carolina counties (Thompson, 2001).

WFRS was no stranger to hurricanes. Just three years prior in 1996, Hurricane Fran devastated the area with high winds. This high wind event toppled trees, caused power outages and damaged numerous structures. Roadways became impassable due to the associated debris.

As Hurricane Floyd approached North Carolina in 1999, WFRS made preparations and had resources well established for another severe wind event. As this storm made its arrival, it proved to be completely different. Rainfall totals of fifteen inches in a twenty-four hour period severely flooded the area (Rigg, 2007).

Nancy J. Rigg quoted Fire Chief Keith Harris (Rocky Mount, NC) in Fire Chief Magazine saying, “in terms of risk assessment, flooding was not a high priority” (Rigg, 2007). Wilson shared the same vision as its neighboring city, Rocky Mount, NC. Caught completely unprepared for this threat, WFRS had response personnel performing rescues and evacuations with less than adequate resources. Wilson Fire Rescue Services entered these flooded areas wearing the only personal protective equipment available -- structural fire fighting gear.

The risk of flooding was now a reality for the City of Wilson. Charged with serving the citizens of Wilson, WFRS reacted by budgeting and acquiring some basic water rescue equipment. Several employees attended specialized technical schools to obtain higher education and develop advanced skills for water rescue. These individuals returned to the organization to offer in-house training to all WFRS personnel.

WFRS reinforced the fact that flooding is a real threat. This reinforcement was captured in the organization's Standard of Coverage (SOC) document. The SOC is part of a very comprehensive study of an organization and the community it serves. This study is a requirement for an organization seeking accredited status under the Commission on Fire Accreditation International (CFAI). In the SOC document, the department is responsible for conducting risk or threat analysis for fire and non-fire risk throughout its jurisdiction. Addressing natural hazards, this risk analysis states, "…flooding from storms poses one of the most severe threats for Wilson" (WFRS, 2006, p. 69).

The third year Executive Fire Officer (EFO) class teaches the importance of a capability assessment. The course manual suggests that a key to preparedness is the

capability assessment (National Fire Academy, 2009, pp. SM 4-32). This course also suggests that the mobilization and/or utilization of resources will be delayed or hampered by failing to conduct an adequate capability assessment (National Fire Academy, 2009, pp. SM 4-32). The capability assessment driven by this research project directly supports the following United States Fire Administration (USFA) operational objectives: (a) promote within communities a comprehensive, multi-hazard risk-reduction plan led by the fire service organization, and (b) to respond appropriately in a timely manner to emerging issues (National Fire Academy, 2008).

Literature Review

This descriptive research project will utilize literature review to explore the applicable research questions identified in the introduction. A common resource used by many fire service organizations are the standards available from the National Fire Protection Association (NFPA). The NFPA 1006 standard explores the professional qualifications for the technical rescuer (National Fire Protection Association, 2008). The scope of NFPA 1006 clearly indicates the standard is intended to offer minimum job performance measures for personnel working as a technical rescuer. Chapter 1, titled

Administration, specifically places responsibility on the authority having jurisdiction (AHJ) as associated with the application of the standard. NFPA Standard 1006 suggests that the AHJ specifically identify what disciplines are to be required for the service provided. This standard further states that the AHJ be responsible for providing the necessary training to maintain said disciplines (National Fire Protection Association, 2008, pp. 1006-5).

NFPA Standard 1006 views water rescue in five (5) disciplines. These five (5) water rescue disciplines include: (a) surface water rescue; (b) swiftwater rescue; (c) dive rescue; (d) ice rescue; and (e) surf rescue (National Fire Protection Association, 2008). Given the geographical response jurisdiction and predominant climate conditions, this researcher will choose to exclude ice and surf rescue for this research project.

NFPA Standard 1006 identifies surface water as water with a velocity of less than one knot (National Fire Protection Association, 2008). This standard suggests that qualifications of a surface water rescuer include the ability to perform a site survey of the hazard area. The surface water rescuer should be able to make proper equipment selection based on the hazard area and develop a search plan for the event. The rescuer will be able to

develop an action plan, interview witnesses, deploy both a reach and a throw water rescue device to reach a victim in the water. Surface water rescuers should be competent in the use of watercraft for rescue operations and be able to support helicopter operations for scenarios involving surface water rescue. NFPA Standard 1006 suggests that training and competencies for surface water rescuers should include watercraft operations, defensive/self-survival swim techniques, as well as patient extrication techniques (National Fire Protection Association, 2008).

NFPA Standard 1006 Chapter 12 provides the professional qualifications for swiftwater rescue. This standard suggests that swiftwater rescuers be competent in the construction of rope systems as applicable to swiftwater. Much like the surface water performance requirements, a swiftwater rescuer should be able to assess the conditions and prepare an action plan for rescue of victims in swiftwater scenarios. This site assessment should include water flow calculations and hazard identification (National Fire Protection Association, 2008). NFPA Standard 1006 suggests that swiftwater rescuers be competent in navigating swiftwater courses that represent those presented within response jurisdiction. The rescuer should be trained in the strategies for both

entry and non-entry applications (National Fire Protection Association, 2008).

NFPA Standard 1006 references dive rescue operations in Chapter 13. This chapter suggests many similarities found in the surface water and swiftwater applications. This chapter of the standard specifically suggests rescuers possess certification from a nationally recognized agency (National Fire Protection Association, 2008, pp. 1006-35). Most notable additions include specifics to safe dive operations that include the proper personal protective equipment (PPE). This standard specifically states that PPE should include an assortment of items to prevent out-of-air emergencies, entanglement and injury from debris (National Fire Protection Association, 2008).

Addressing the professional qualifications of a technical rescuer, NFPA Standard 1006 provides an organization with a starting point to prepare a rescue team. This literature resource is applicable to the research project goal for performing a capability assessment by helping identify the suggested qualifications a rescuer should possess for water rescue.

The NFPA Standard 1670 provides guidance specific to the capability and function for conducting operations at technical rescue incidents (National Fire Protection

Association, 2009). Chapter 9 of this standard specifically references water rescue. This standard recognizes three responder levels for water rescue. These levels are awareness, operations, and technician.

The awareness level can be summarized as a competent person who is able to recognize the need for water rescue. Awareness level responders should be able to identify and activate the appropriate resources needed for the event. Awareness level responders should be trained in hazard recognition and site/scene control measures. This responder level should be able to evaluate the event to determine rescue potential verses body recovery (National Fire Protection Association, 2009).

The NFPA 1670 standard recognizes four disciplines for responders at the operational and technician level. These levels are broken down much like the NFPA 1006 standard based on the environment involved. The disciplines dive, ice, surf, and surface/swift water are addressed individually for both operations and technician levels. Given the geographical response jurisdiction and predominant climate conditions, this researcher will exclude ice and surf rescue for this research project.

The operations section of this standard begins with some universal guidelines intended to apply to all four (4)

disciplines. The general guidelines include, as a prerequisite, that the rescuer should meet the requirements listed in the awareness levels for that respective discipline. These guidelines outline the PPE responders should use. This selection of PPE includes a personal flotation device (PFD), thermal protection, helmet (appropriate for water rescue), cutting device, whistle and contamination protection (as needed) (National Fire Protection Association, 2009). The general guidelines suggest that operations personnel should be able to size up the hazards, ensure responder safety, and assist technicians with rigging mechanical advantage systems. The operations responder should be able to deploy and recover any watercraft used by the organization and assist with victim packaging. Operations responders should be able to deploy surface water search operations and perform rapid extrication of accessible victims. Operations level responders should be trained in the basics of survival swimming and self-rescue (National Fire Protection Association, 2009).

Operations level dive rescuers should be able to recognize hazards and provide service as surface support personnel. These rescuers provide support equipment and assist with the safe entry and recovery of divers. These

rescuers should be prepared to participate in any climate the jurisdiction may experience (National Fire Protection Association, 2009).

Rescuers functioning as operations level for surface and swift water should be competent at the operations level for rope rescue. These rescuers shall be able to size-up the situation, identify the hazards and deploy tag lines or tension diagonals. Operations level, surface water rescuers should be trained for self-rescue and survival swimming (National Fire Protection Association, 2009).

The technician responder section of NFPA Standard 1670 begins with some universal guidelines intended to apply to all four disciplines. The general guidelines include, as a prerequisite, that the rescuer should meet the requirements listed in the awareness and operations levels for that respective discipline. The NFPA 1670 standard also suggests that technician level responders shall meet the requirements of Chapter 4 of NFPA 472 (Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents). Technician level responders shall be competent to perform boat-based rescues as well as operations that require the rescuer to enter the water (National Fire Protection Association, 2009). The technician level requires that the rescuer be able to

perform basic skills to include swimming, floating and water survival skills. These skills shall be performed with and without flotation devices (National Fire Protection Association, 2009).

The NFPA 1670 standard suggests that technician level, dive rescue personnel shall be certified by a nationally recognized agency. This certification shall be oriented for dive rescue and public safety operations. Technician level divers shall complete an annual fitness and skills test (National Fire Protection Association, 2009). Technician level divers shall use appropriate dive tables and understand the underwater environment. Technician level divers shall equip and train to perform accepted search techniques. Divers should understand the various dive related psychological and physiological stressors associated with diving (National Fire Protection Association, 2009). Organizations should implement redundant air sources to eliminate out-of-air or low-air emergencies. Where appropriate, organizations should ensure proper contamination protection measures are used (National Fire Protection Association, 2009).

The NFPA 1670 standard suggests that responders operating at the technician level for swift water incidents shall meet the technician level requirement for rope

rescue. Organizations operating at the technician level for swift water shall implement procedures for and apply the use of rope rescue techniques in swift water environments (National Fire Protection Association, 2009).

Standard 1670, provided by NFPA, offers an agency a set of guidelines with specific capabilities and functions for the various levels of water rescue provider. This NFPA 1670 standard can be used as a foundation document to define team capabilities.

The U.S. Department of Homeland Security Federal Emergency Management Agency (FEMA) provides definition of resource types. This document serves as a basis for universal team typing by helping define resource capability (FEMA, 2005). Under this team-typing guide, resources from various jurisdictions sharing the same team type designator should be similar in operational scope and capability. The background for this comes from the National Mutual Aid and Resource Management Initiative. This concept supports the National Incident Management System (NIMS) by providing a basis for defining teams by their respective capability (FEMA, 2005).

This document recognizes four different levels of response teams. These four levels are under the title of “Swiftwater/Flood Search and Rescue Team” (FEMA, 2005, p.

30). The teams are given numerical designators and called Type I, Type II, Type III and Type IV. The guidance document provides the minimum capabilities to qualify as one of the team types. The team-typing document indicates the Type I team is the most comprehensively equipped and staffed while the Type IV carries the least resources (FEMA, 2005).

The FEMA document indicates Type IV teams must have a minimum of three (3) members. One (1) member is designated as a squad leader with the remaining designated as personnel. One of these individuals must be certified as an Emergency Medical Technician Basic (EMT-B). This team must be prepared to sustain low-risk, land based operations for 18 hours (FEMA, 2005). Type IV teams are not required to perform in-water contact rescue nor dive rescue. This team's training should include paddle skills, hazmat, incident command, contact and self-rescue skills. These team members should be Swiftwater Rescue Technician level responders (FEMA, 2005). Equipment for a Type IV team includes portable radios (with batteries), a basic life support (BLS) kit, and blankets. Team members should be equipped with flares, markers, bags, flashlights, gloves, helmets, light sticks, Type III/IV Personal Flotation

Device (PFD), knives, shoes and whistles as personal items (FEMA, 2005).

Type III teams are required to meet all the basic requirements of a Type IV team. The Type III team is comprised of a minimum of four (4) members. These positions are identified as one (1) squad leader and three (3) personnel. The Type III teams should have one member trained for technical animal rescue. The Type III team will have at least one (1) non-powered watercraft with a four (4)-person capacity (FEMA, 2005).

Type III team capabilities include search operations using non-powered water craft, in-water contact rescue, and dive rescue operations (FEMA, 2005). To meet the need for dive operations the FEMA document recommends a minimum of two (2) members be trained for Self Contained Underwater Breathing Apparatus (SCUBA) operations.

The members performing dive operations for a Type III team should have sixty hours of public safety diver training (FEMA, 2005). To support the SCUBA operations the Type III team shall maintain a minimal amount of SCUBA equipment. This equipment list includes SCUBA cylinders, cutting tools, full-face mask, underwater communications, dry suit search line, chest harness, buoyancy compensator and weight belt.

Type II FEMA teams are required to meet all the minimum requirements of a Type III team. The Type II team is a larger team. This team is a minimum six (6) member team. The team designators are suggested by FEMA as one (1) squad leader and five (5) personnel. Type II teams are required to have a minimum of two (2) personnel trained in helicopter aquatic rescue operations. Type II teams shall be prepared to sustain operations for twenty-four hours.

Capabilities for a Type II team include, managing search operations, animal rescue, helicopter operations, and power vessel operations. Type II teams shall have at least two members trained as powerboat operators. Type II teams should be proficient in technical rope systems (FEMA, 2005). Type II teams shall have a minimum of one (1) fuel powered rescue vessel (FEMA, 2005).

This FEMA team-typing document recognizes the Type I team as the most comprehensive team. A Type I team must meet all the minimum requirements listed for the previous three teams. The team-typing document indicates a minimum of fourteen (14) personnel for a Type I team. This team composition is suggested to have two (2) team managers, two (2) squad leaders, and ten (10) personnel (FEMA, 2005). Two (2) of the members of a Type I team must be trained as technical animal rescuers (FEMA, 2005). In several areas

the requirements double from those listed for a Type II team. Type I teams are required to have four (4) personnel trained for helicopter aquatic rescue operations, four (4) powerboat operators, and four (4) SCUBA trained (FEMA, 2005). The Type I team is required to have fourteen (14) members trained as EMT-B minimum with two (2) trained to the paramedic level (FEMA, 2005).

Type I teams must be able to sustain operations for twenty-four hours. These operations may include managing search operations, providing advanced life support, logistics, communications, helicopter rescue operations, and powerboat operations (FEMA, 2005). Divers working for a Type I team must have a minimum of eighty hours public safety dive training. Type I teams are required to have two (2) fuel powered water rescue vessels, equipment trailer and support vehicle (FEMA, 2005).

This document, provided by FEMA, gives guidance to organizations building water rescue teams. Organizations can use this document to identify the resources needed to be a recognized provider by the National Mutual Aid and Resource Management Initiative (FEMA, 2005).

The North Carolina Association of Rescue and Emergency Medical Services (NCAREMS) is a group of organizations within the state that have come together to promote a

common vision for rescue providers in North Carolina. The objectives of this association include promoting the ideas of organized rescue, assist training, and promoting safe practices and innovative services (NCAREMS, 2009). The NCAREMS has developed a list of standards organizations can use to become recognized providers through the association. This list of standards includes guidelines for dive rescue, ice rescue, ocean rescue, open water (still water), and swift water rescue. Given the geographical response jurisdiction and predominant climate conditions, this researcher will exclude ice and ocean rescue for this research project.

The NCAREMS suggests that the scope of practice for open water rescue is water recovery efforts. This scope is an initial responder utilizing recovery methods that include; but not limited to dragging devices and grappling hooks (NCAREMS, 2007a). Organizations functioning as providers under this standard shall have all the required licensing, registration and safety equipment outlined by the NC Wildlife Resource Commission, the US Coast Guard or other regulating agency (NCAREMS, 2007a). NFPA Standard 1670 requires providers equipment list to include two (2) throw bags per watercraft, an eighteen-inch Type IV

Throwable Device, body recovery equipment, and a set of incident command forms (NCAREMS, 2007a).

According to NCAREMS, Swiftwater rescue providers operating at the Operations or Technician Level must meet the applicable NFPA 1670 Standard for their respective provider level (NCAREMS, 2007b). The NCAREMS standard for swiftwater teams provides a very detailed list of required equipment. This equipment list (see appendix B) specifies guidelines for personal protective equipment, basic marking devices and rope related equipment. This document suggests that it meets the requirements for a FEMA Type IV team (NCAREMS, 2007b).

Dive rescue, as recognized by NCAREMS, references back to NFPA Standard 1670 for equipment listing (NCAREMS, 2007c). The NCAREMS standards requires the authority having jurisdiction submit a full listing of dive rescue equipment when applying for certification. This equipment list must include, at a minimum, four (4) sets of personal dive equipment (NCAREMS, 2007c). According to NCAREMS, dive rescue providers operating at the Operations or Technician Level must meet the applicable NFPA 1670 Standard for their respective provider level (NCAREMS, 2007c).

The standards provided by the NCAREMS provide organizations guidance to become certified providers within the State of North Carolina. As evident by the references made in the standards, the NFPA 1670 standard is a model for developing these documents.

Procedures

This descriptive research paper was conducted to study the WFRS water rescue program. The problem identified in this project is the lack of a capability assessment. The purpose for this research project was to conduct a water rescue capability assessment. To complete this research project the study was broken down into four phases. Each of these four phases directly relates to one of the research questions.

In the first phase, literature review was utilized to study available standards an organization may use to develop a water rescue team. This procedure was chosen to serve as a foundation in the capability assessment process.

This research found that the NFPA offers standards with specifics in water rescue. The NFPA 1006 standard came first in this research. This standard explores the professional qualifications of a technical rescuer. Water rescue (considered a technical rescue event) is addressed specifically in chapters 11, 12, 13, 14, & 15 with some

general administration references that apply to all disciplines. Due to the geographic location of this jurisdiction and the predominant climate conditions, this research excluded the ice and surf rescue information in this study.

The NFPA 1670 standard was reviewed to explore the operations and training for technical rescue incidents. The water rescue specifics are found in chapter 9 of this standard. The NFPA 1670 standard identifies responders as awareness, operations, or technician level.

The second phase of this project involved the research of federal and/or state guides that an organization may use to aid the development of a water rescue team. This procedure was used to offer correlation between federal and/or state guides and the department's current program.

Documents available through FEMA outline the requirements for teams to be recognized under the National Mutual Aid and Resource Management Initiative. This research project utilized these documents to explore the requirements to be a recognized provider. The FEMA document refers to teams by a specific number. Type I teams are the largest and required to have the largest cache of resources. Type IV teams are the smallest and require the least amount of resources. Procedures for

researching these teams began with the Type IV team and progressed to Type I team.

A local search for information found standards available from the NCAREMS for rescue providers. These documents outline minimal requirements necessary to be a recognized NCAREMS provider. The NCAREMS standards are broken into various disciplines based on the geographical and climate conditions. Procedures for this research excluded the research of ice and ocean rescue. These exclusions were made because of predominate climate conditions and geographical location of this jurisdiction. Research procedures included a review of the dive, open (still water) and swift water rescue standards.

Procedures for phase three of this project involved identifying resources available to supplement and/or support water rescue responses in this jurisdiction. Procedures for identifying support resources began with personal communication with the County Emergency Management Director, Mr. Gordon Deno on May 03, 2010 (email, May 3, 2010). Mr. Deno was chosen because of his formal role as the county's Emergency Manager. Mr. Deno maintains a database of resources relevant to public safety and emergency response. A descriptive statement was provided in the opening of the email communication sharing the

purpose of this research project. In the communication, Mr. Deno was asked to help identify resources available for immediate assistance with water rescue incidents in this jurisdiction. During this personal communication, the following questions were asked:

1. Name of agency/provider?
2. Address and/or contact information for the agency/provider?
3. Level of water rescue service they provide (i.e. FEMA team type, or NC Association of Rescue and EMS certification, swiftwater, dive, open/still water and what level; Awareness, Operations, Technician)?
4. Is the agency self-sufficient or will they require other support to operate?

This same phase of research included a personal communication with Jim Campbell, Chief of the Wilson County Rescue Squad (email, May 19, 2010). Wilson County Rescue Squad is a volunteer organization that provides basic life support, transport, and technical rescue services to Wilson County. This agency was chosen for this research because it is located within the immediate area and provides rescue services within this jurisdiction. In this communication, the following questions were asked:

1. How many members are on the team?
2. How many members are certified “Technician” level providers?
3. How are members selected for the team?
4. Do you require any type physical assessment (swim test or skills test) to join the team?
5. Is there an annual physical assessment for active team members?
6. Is the team exclusive to Wilson County Rescue personnel only (are members of other agencies able to join the team)?
7. Does Wilson County Rescue have a standard of cover or a performance measure that establishes response times?
8. If Wilson County Rescue is called how many team members would be expected to respond?
9. Would all team members be water rescue trained?
10. Does the team have helicopter or dive capabilities?
11. Does the team have Advanced Life Support (ALS) medical provider capabilities?

Personal communication with Captain Billy Radford from the Wilson County Sheriff’s Office was conducted via electronic mail (email, April 05, 2010). Wilson County Sheriff’s office is the only public safety dive provider in

the immediate area. This agency was chosen for this research because it is located within the immediate area and provides the only dive service within this jurisdiction. In this communication, the following questions were asked:

1. How many individuals make up the Wilson County Sheriff's Office Dive Team?
2. What certifications are required to become a member of the dive team?
3. If requested for deployment how many personnel can be expected to respond to assemble a functioning dive team?
4. How long does it take to assemble a functioning dive team from the initial request for help?
5. Is the dive team self-sufficient or are other resources required for deployment?
6. In the event we call for the dive team is there an associated cost we (or responsible party) would be responsible for?

Communication was made with Rocky Mount Fire Department as a part of this research. This department was chosen for research due to its similarities with the City of Wilson in both departmental size and geographical area. Rocky Mount is the closest municipality to the City of

Wilson providing water rescue responses. This personal communication was conducted via electronic mail with Battalion Chief Jamey Moss (email, May 3, 2010). During this personal communication, the following questions were asked:

1. How many members are on the water rescue team in Rocky Mount?
2. How are members selected for the water rescue team?
3. Do you require any type physical of assessment (swim test or skills test) to join the water rescue team?
4. Is there an annual physical assessment for active water rescue team members?
5. Is the water rescue team exclusive to Rocky Mount employees only (are members of other agencies able to join the team)?
6. If called through a mutual aid request how long can be expected to deploy a water rescue team to the City of Wilson?
7. Is there a cost for deployment if the water rescue team is requested to Wilson?
8. If called how many water rescue team members could we expect to be deployed to Wilson?
9. Does the water rescue team have helicopter or dive capabilities?

10. Does the water rescue team have ALS medical provider capabilities?

A personal communication with Tracy Mosley, Deputy Chief of Operations for City of Wilson Fire Rescue Services (personal communication, May 17, 2010) was also made during this phase of research. This personal communication took place in Chief Mosley's office and lasted approximately 60 minutes. This communication was chosen because WFRS serves as a primary response agency for technical rescue events inside this jurisdiction. Prior to entering into the questions, Chief Mosley and I discussed the purpose for this research project. We explored the information learned from the literature review. We discussed how these literature references might apply to our organization. As a preface to introducing the questions, I expressed that the questions were designed to stimulate discussion and in no way were intended to pressure any departmental commitments. In this communication, the following questions were asked:

1. What level of service does our department expect to deliver now for water rescue response?
2. Is there a departmental vision or desire to expand the level of water rescue service in the future?

3. Is the department open to expanding levels of service in the water rescue field if the individual employee provides some of their own personal protective equipment (e.g. SCUBA equipment, personal thermal protection, personal helmets, etc…)?
4. If the department desires to expand the levels of service in water rescue, what kind of timeline do you think is appropriate to implement this expansion?

The fourth phase of this research focused on an internal assessment of WFRS. This assessment was conducted by reviewing equipment inventory, staffing, training and certifications. Procedures for reviewing equipment inventory included an audit of the apparatus/equipment inventory sheets to identify items specific to water rescue. The staffing, training and certification research was extracted from an annual survey (see appendix) conducted through the WFRS Training Division. This annual survey is a form sent out by the WFRS Training Division to all members of the organization. The survey identifies formal education, special training and skills as well as certification expiration dates. This survey specifically identifies personnel with certifications in water rescue and SCUBA.

Limitations influencing this research project include the subjectivity of those contacted via personal communication. These limitations may be realized by the dynamic nature of service delivery programs. Many organizations go through program changes as a constant improvement process and therefore may cause this information to become outdated. One must consider that the personal communications were appropriate for that day and time. Conducting this same process at a later date may generate different data as a result of this limitation.

A similar limitation is present in the literature review for this project. This research project utilized literature references (e.g. NFPA Standards) that undergo periodic review and updates. Recreating this research using literature of this type, may return different data if an updated edition and/or standard is selected.

Results

The results from the first phase of this research project found that NFPA offers clear guidance for an organization offering water rescue response. Specifically, NFPA 1006 standard provided information for the qualifications of a technical rescuer. The NFPA 1006 document recognizes in chapter 1 that the AHJ has a responsibility to apply the standard in such a manner to

satisfy their service needs (National Fire Protection Association, 2008). This document specifically addresses water rescue in chapters 11-15.

Results from researching NFPA 1006 found that qualifications vary depending on the environment and type of water rescue the organization provides. This research also found some similarities that apply to all disciplines of water rescue. Some of the similarities include site assessment or scene size-up, hazard recognition, and proper equipment selection.

NFPA 1006 suggests surface water rescuers be qualified to perform reach and throw water rescue devices (National Fire Protection Association, 2008, pp. 1006-31). The surface water rescuer should be competent in the use of watercraft, patient extrication, and defensive/self-survival swimming techniques (National Fire Protection Association, 2008).

NFPA 1006 suggests that swiftwater rescuers be qualified in applicable rope rescue operations as they apply to water rescue environments (National Fire Protection Association, 2008, pp. 1006-33). Swiftwater rescuers should be competent in watercraft operations in swiftwater conditions. The rescuer should be competent in

both entry and non-entry rescue applications (National Fire Protection Association, 2008).

NFPA 1006 suggests the dive rescuer utilize proper PPE for dive rescue operations. Strategies should be developed and engaged to prevent out-of-air emergencies and injury from entanglements (National Fire Protection Association, 2008). The NFPA 1006 standard specifically refers dive rescuers to seek certification from a nationally recognized agency (National Fire Protection Association, 2008, pp. 1006-35).

Results from the NFPA 1670 literature review found that this standard recognizes three (3) levels of responders. These levels are awareness, operations, and technician (National Fire Protection Association, 2009). The awareness level responder is an entry-level responder with the technician being the more advanced of the three. The NFPA 1670 standard provides responders with a recommended personal protective equipment list. This list includes appropriate PFD, thermal protection, helmet (appropriate for water rescue), cutting device, whistle, and (as needed) contamination protection (National Fire Protection Association, 2009, pp. 1670-18). Much like the NFPA 1006 standard, NFPA Standard 1670 recognizes water rescue disciplines based on the specific environment. This

research was limited to those applicable to the geographic and climate conditions predominate to the response jurisdiction. This research found the disciplines of ice and surf rescue were not applicable to this jurisdiction and therefore were not included in the research.

The NFPA 1670 standard suggests the awareness level responder may be considered a competent person capable of recognizing the need for water rescue and activating the appropriate response. The awareness level responder should be trained to adequately facilitate scene control (National Fire Protection Association, 2009).

Operations level responders are trained to support the functions of technicians. The operations level responder should be able to deploy and recover watercraft, surface water search operations and provide rapid extrication of accessible victims. The operations level responder should be trained in self-survival and self-rescue swimming techniques (National Fire Protection Association, 2009).

Technician level responders are the most advanced rescuers recognized by NFPA Standard 1670. NFPA Standard 1670 suggests the technician responder be cross trained in rope rescue applications and hazardous materials (National Fire Protection Association, 2009). The technician level responder should be trained to perform boat based rescue as

well as operations that require a rescuer to enter the water. The technician responder should be able to perform a list of basic skills including swimming, floating, and water survival skills. These skills should be performed with and without the aid of swim aids and floatation devices (National Fire Protection Association, 2009).

Much like NFPA Standard 1006, the NFPA 1670 standard recommends technician dive rescuers seek certification from a nationally recognized agency. This training should include specific instruction for public safety diving (National Fire Protection Association, 2009, pp. 1670-19). NFPA Standard 1670 states that divers should participate in an annual fitness and skills test. Divers should have an understanding of the various physiological and psychological stressors associated with an underwater environment (National Fire Protection Association, 2009). Divers should be trained in performing underwater search techniques and the use of appropriate dive tables. Organizations providing dive rescue operations should implement procedures to eliminate out-of-air or low-air emergencies. Organizations should also provide appropriate contamination protection where applicable (National Fire Protection Association, 2009).

The second phase of research included an exploration of the FEMA team typing documents organizations may use to guide team development. The documents come from the National Mutual Aid and Resource Management Initiative supporting the NIMS management system. The documents provide a common vision of the resource based on their respective capability (FEMA, 2005). The FEMA document refers to the water rescue teams as “Swiftwater/Flood Search and Rescue Team” (FEMA, 2005, p. 30). These documents recognize four (4) team types that are given numerical designators. A Type I team is the most comprehensively staffed and equipped. The Type IV team is the smaller and least equipped of the four (4) teams. The team-typing document provides guidance for staffing levels, equipment inventory, operating parameters, and skills the team should possess.

Searching for guidelines within the State of North Carolina, this research found that NCAREMS provides standards an organization may use to develop rescue teams. Included in the standards are documents that define the requirements to be a NCAREMS recognized water rescue provider. This research found the requirements in these documents mirror the NFPA 1006 and 1670 standards. Much like the NFPA standards the NCAREMS documents separated the

water rescue disciplines based on the environment. The disciplines applicable to this research include dive rescue, open water (stillwater and/or surface water), and swiftwater rescue. The swiftwater document provided by NCAREMS also suggests that compliance with the document will meet the minimum FEMA Type IV team requirements (NCAREMS, 2007b, p. 4).

The third phase of this research focused on identifying resources available to supplement and/or support water rescue responses in this jurisdiction. Results from this research indicated we have two resources located within the immediate jurisdiction (excluding WFRS) that provide some type of water related response. These agencies are the Wilson County Sheriff's Department and Wilson County Rescue Squad.

Results from communication with the Wilson County Sheriff's Office confirmed the organization provides a dive service. Capt. Radford (email, April 05, 2010) was very quick to state that the team is a dive recovery team, not a rescue team. The team consists of eight (8) personnel with varying levels of training. Capt. Radford stated the minimum requirements to participate on the team are certification from a nationally recognized dive agency with

specific training as a rescue diver (email, April 05, 2010).

Capt. Radford (email, April 05, 2010) alluded to a recent reduction in team members in his communication. Capt Radford indicated that team members are responsible for providing and maintaining their own equipment. The expense associated with this has caused some individuals to leave the team. Capt. Radford continued to indicate that some of the physiological and psychological stressors associated with public safety diving (e.g. cold water conditions, aquatic life associated with warm water creeks and ponds, severely reduced visibility, etc…) contributed in part to some divers leaving the team (email, April 05, 2010).

Capt. Radford indicated the team could expect to assemble a four (4) to six (6) person team when called. The estimated time to assemble this team may be up to two (2) hours (email, April 05, 2010). According to Capt. Radford, the extended time to assemble a functioning team is a primary reason the team is considered a recovery not a rescue team (email, April 05, 2010).

The dive team is mostly self-sufficient. The team responds with a utility truck and a fourteen-foot aluminum boat. According to Capt. Radford (email, April 05, 2010),

there is no cost to WFRS for activating this team. There is case history where the team deployed two (2) off-duty divers to aid the recovery of a vehicle submerged in the City of Wilson's primary water supply. The responsible party was accountable for the cost of the divers.

Results from communication with the Wilson County Rescue Squad indicated that the team does provide a water rescue response to this jurisdiction. Chief Jim Campbell indicated the team has approximately fourteen (14) members on the team. The team has three (3) members certified as Swift Water Rescue Technicians with the remaining trained in still water rescue (email, May 19, 2010). Chief Campbell indicated that team members are selected from the ranks of the volunteer squad. The selections are based on the classes taken and skills they possess.

Wilson County Rescue team members are required to perform an entry-level swim and tread water test prior to attending the certification classes. Chief Campbell indicated that there was no annual physical assessment to maintain team membership (email, May 19, 2010).

Activating the water rescue response from this agency would bring a minimum of three (3) personnel to the scene. Chief Campbell indicated that because this is a volunteer agency they have not established a standard of cover for

response. Chief Campbell said that call history indicates that the average response time for the team was less than thirty minutes on recent incidents (email, May 19, 2010).

Wilson County Rescue Squad presently does not have dive capabilities. The squad has members trained for dive operations, however, the equipment is not provided and the agency does not provide this service (email, May 19, 2010).

The Wilson County Rescue Squad is a basic emergency medical provider with transport capabilities. The squad has team members that are certified as Paramedics, however, the squad is not an advanced life support provider (email, May 19, 2010).

This research explored other resources that may be available to assist this community with water rescue. This was done by contacting Mr. Gordon Deno, Wilson County Emergency Manager, via electronic mail (email, May 3, 2010). As the County Emergency Manager, Mr. Deno maintains a list of resources relevant to public safety and emergency response. Results from this contact led me back to Wilson County Sheriff's Office for dive recovery operations and Wilson County Rescue as a water rescue provider. Mr. Deno provided a map (see appendix D) of all the water rescue teams recognized by the State of North Carolina Emergency Management (NCEM). Providers eligible to be recognized by

NCEM must meet the minimum requirements as a FEMA Type III Team. The map indicates there are no recognized FEMA teams in the County of Wilson. The map indicates that over fifty percent of these teams are located in the North Carolina Emergency Management Western Branch. This branch encompasses thirty-four of the state's 100 counties. Located within this branch are fourteen (14) teams. Combined, the central and eastern branches encompass sixty-six counties. The map indicates only thirteen (13) teams in these two (2) branches combined. The closest recognized team is located in Rocky Mount, NC.

Battalion Chief Jamey Moss with Rocky Mount Fire Department (RMFD) was contacted via electronic mail on May 3, 2010. This communication found that RMFD has a FEMA Type I team (email, May 3, 2010). This team can deploy fourteen (14) members to our area in an estimated forty-five to sixty minutes (email, May 3, 2010). The RMFD water rescue team employees personnel certified to provide advance life support functions and has both helicopter and dive trained personnel.

This team is exclusive to RMFD employees. For an employee to petition membership with the team, he or she must submit an application with applicable certifications attached. The candidate then participates in a swim test.

Once an employee is a member of the team, he or she must complete an annual physical assessment (swim test) to maintain membership (email, May 3, 2010).

Battalion Chief Moss indicated that there is no cost for mutual aid deployments (email, May 3, 2010). WFRS can activate this team by direct contact under the statewide mutual aid agreement or through NCEM.

The research project included an interview with WFRS Deputy Chief Tracy Mosley (personal communication, May 17, 2010). Chief Mosley is the Operations Chief for WFRS. The interview with Chief Mosley provided detailed information about the department's expectations and vision for water rescue.

When asked about the level of service our department expects to deliver, Chief Mosley quickly stated, "the best possible with the resources we have" (personal communication, May 17, 2010). He elaborated, suggesting that our limitations in water rescue must be recognized. The number of trained personnel and station assignment locations creates some limitations in response. Chief Mosley suggested that an Incident Commander must be constantly aware of his/her staffing. The strengths and weaknesses must be considered when deploying tactics for water rescue. Chief Mosley suggested that if there are not

enough trained responders on the call either a call back or mutual aid would have to be activated (personal communication, May 17, 2010).

Chief Mosley suggested that the department has a vision to deliver the best service possible to the community. He implied that he felt this program would expand in the future. Mosley continued to explain that this vision of service delivery comes with a responsibility to balance funding with demand for service (personal communication, May 17, 2010).

Chief Mosley and I discussed the possible option of personnel utilizing some personally owned equipment for water rescue response. Examples that were provided in the discussion were PPE (e.g. thermal protection) and specialized self-contained underwater breathing apparatus equipment for dive operations. Chief Mosley said the department would consider this option. He suggested that this might help advance service delivery to our community (personal communication, May 17, 2010).

Chief Mosley and I discussed timelines for future expansion of this program. Again, Chief Mosley reminded me that we have the responsibility to balance funding with demands for service. Chief Mosley suggested that limitations to expand the water rescue program were not due

to lack of departmental desire. The limitations are directly tied to funding available to support such an expansion. Chief Mosley suggested we look at potential grant opportunities to help develop this program (personal communication, May 17, 2010).

The last phase of this research project was an internal assessment. This assessment focused on assets such as equipment, staffing, training, and certifications within WFRS. A study of the personnel assets revealed we have nine (9) personnel with specialized training in surface and swiftwater rescue. This same study revealed we have nine (9) personnel with specialized training in dive operations. The results from this study found that five (5) of the surface/swiftwater trained employees are also included in the nine (9) dive certified personnel. This indicates that we have thirteen (13) personnel with some type of formal water rescue and/or dive training. Five (5) of these thirteen (13) WFRS members have training in both disciplines.

A study of the equipment resources revealed we have a compliment of equipment dedicated to water rescue response. This equipment includes PFDs (equipped with lights, knives, strobes, and whistles), helmets, rescue rope, throw bags, one powered watercraft, and one inflatable raft. The

research found that the department does not provide any form of thermal or contamination protection for water rescue personnel. The majority of this equipment is located at WFRS Station #5. Some supplemental equipment (e.g. rope rescue equipment for tension diagonals) is located throughout the city assigned to various frontline apparatus. The equipment is loaded onto a trailer system that is kept connected to a one (1) ton rated truck designated as a multi-use vehicle. Researching the staffing chart, this study found that we have four (4) personnel assigned to Station #5 on each shift. Multiply this times three (3) shifts results in twelve (12) personnel assigned to the station. The study found that only two (2) of the twelve (12) personnel assigned to Station #5 have water rescue credentials. Additionally, this review of the staffing chart indicated that two (2) of the personnel assigned to Station #5 are non-swimmers.

Discussion

This research found the NFPA standards provide a good roadmap for developing water rescue teams. The NFPA 1006 and 1670 standards combine to offer an organization guidance that one may consider a best practice. This research project has indicated to me that the documents complement each other. It is my opinion that the documents

should be referenced in unison by any organization wishing to develop a water rescue team. These documents provide a common vision for the professional qualifications a technical rescuer should possess. The documents also provide a common vision for the operations and training for technical rescue events. This research project accepts that the standards are merely a guide and the AHJ has the ultimate responsibility to apply them, as they deem appropriate.

This research project explored the FEMA team typing for water rescue. The intent of the FEMA document is to provide a common definition of resources that are recognized across the country. The FEMA team-typing document defines minimum team size, minimum equipment cache, functionality, and scope of operations. Using the FEMA team-typing document an organization may choose to target a specific team based on these predetermined parameters. This research found that the FEMA document does not compete with nor contradict the NFPA standards.

The NCAREMS is an association that departments in North Carolina may choose to register as a member. Organizations are required to pay an annual registration fee for membership. This association is highly recognized across the state; however, participation is in no way

mandated for any organization. Much like the FEMA documents, the NCAREMS provides recognition for various service delivery types. Once an organization becomes a member of the association, that organization may petition to become a recognized provider for a given discipline. The association's documents for water rescue mirror the NFPA 1006 and 1670 standards. Organizations need not be members to access the documents. This provides an opportunity to use the documents as a developmental guide without investing in the membership costs.

This research explored local resources that may be utilized to supplement water rescue responses in this jurisdiction. The theory for this is to conduct a capability assessment -- we must focus on delivering a service to the community. By exploring other resources, we can have a better understanding of our community's strengths and weaknesses. This will help ensure we are prudent with our taxpayer's money and efficient in service delivery.

This local search found that we have two (2) agencies that provide water responses. The Wilson County Sheriff's Office provides a dive service and the Wilson County Rescue Squad provides a water rescue team. We found in the

research that both teams have some great features and some limitations.

The Wilson County Sheriff's Office Dive team clearly acknowledged that they are not a rescue team. Capt. Radford pointed out that the team's response time would prevent them from being able to perform rescue operations (email, April 05, 2010). The team focuses their efforts towards recovery operations. The Sheriff's team has also experienced a loss of membership in recent history thereby limiting the number of responders they can deploy.

The Wilson County Rescue Squad is a volunteer organization that provides rescue service countywide. This organization has fourteen (14) members on the water rescue team with three (3) of the team members certified as technicians. Chief Campbell stated that because the organization was volunteer, they did not have an established standard of cover for response. Chief Campbell suggested that previous call history indicates they have an average response time of thirty minutes or less. Chief Campbell indicated that this response would bring a minimum of three (3) personnel to the scene (email, May 19, 2010). Wilson County Rescue does not provide dive operations. The squad has members that are trained divers but the equipment

is not provided to support this service (email, May 19, 2010).

With both agencies residing in this jurisdiction and delivering some type of water response, we consider these valuable resources to this community. Limitations must be considered when evaluating these resources to meet the needs of the community. Neither team provides a standard of cover for emergency response. The dive team recognizes their response limitations and therefore refers to the team as a recovery team. Wilson County Rescue is dependent on volunteers to answer the call for service. While Chief Campbell referenced historical performance, this research project must recognize this as a potential limitation.

Contact was made with Wilson County's Emergency Manager, Gordon Deno. Mr. Deno, by virtue of his position, maintains a listing of resources that are available in the event of an emergency. Mr. Deno provided a map which outlines the flood/swiftwater rescue teams in the State of North Carolina. To be included on this map a team must meet the FEMA Type III requirements as a minimum. The closest recognized FEMA team to our jurisdiction is located in Rocky Mount, NC.

The map indicates that there are twenty-seven teams in the State. Over fifty percent of these teams are located

in the North Carolina Emergency Management Western Branch. This concentration of resources creates an unbalanced service to the State. To focus this on a local level, if our jurisdiction experiences another major flooding event, a competition for resources could quickly develop. It is realistic to believe that the few resources in this area of the State could quickly become overwhelmed and our ability to rely on mutual aid from a State level could become delayed, at best.

Battalion Chief Jamey Moss with RMFD was contacted via electronic mail on May 03, 2010. Chief Moss was able to share information specific to the Rocky Mount Swift Water Rescue Team. This team is a recognized Type I FEMA team. The team is capable of providing several disciplines of water rescue including dive rescue. The team is exclusive to Rocky Mount employees. The Rocky Mount team is capable of deploying to our area with an estimated forty-five to sixty minute response time (email, May 03, 2010). The team deploys with a minimum of fourteen (14) trained personnel.

This research indicates this is a valuable resource that may be called upon to supplement responses in this area. Limitations that must be realized are the extended response time estimates. Extended response times may cause a potential rescue scenario to result in a recovery. Other

limitations include events such as major disasters. Such an event may cause their local authority or NCEM to deploy this team making them unavailable for conventional mutual aid response. This team is in such proximity that natural disasters are likely to affect both jurisdictions. This may cause a need for similar resources in different locations. This research has led me to believe that Rocky Mount's team may prove to be a valuable model for others wishing to develop a team.

Looking internal, I interviewed Deputy Chief Tracy Mosley. This intent of the interview was to help me get the perspective of our department's expectations. To work through a capability assessment, it is important to have a clear vision of the department's expectations. Chief Mosley helped confirm the overall vision of the organization. One may summarize this vision as providing the best service to our customers in an efficient and effective manner. This includes prudent use of taxpayer funds.

Chief Mosley suggested that the Incident Commander must make a determination on scene based on his/her situational analysis and resources. This type of decision is common for an Incident Commander. No matter the incident type, the command officer must examine the

situation, take inventory of the responding resources, and deploy a series of strategic goals and tactics to mitigate the incident. When this situation is involving a water rescue situation the basis for this command sequence is the same. When faced with the water rescue event the Incident Commander must consider the specialized training and equipment needed and mobilize the proper resources. This concept holds true even when mobilizing the proper resources requires the call for mutual aid.

In this interview, we discussed the possibility of department members using their personal equipment for water rescue. This met with positive results. Chief Mosley did not provide a generic yes to this proposal. He did however indicate that this was an option that may would help expand our levels of services. While this is an option we must consider the results of such a program used by the Wilson County Sheriff’s Office. This organization has experienced a reduction of team members simply because of the expense related to maintaining their personal equipment. Should our organization embrace such a concept, strategies must be considered to avoid a similar result.

Chief Mosley and I discussed a desire timeline for expanding the service delivery for water rescue. This proves to be a difficult question to answer. While we

desire to provide the best service possible to our customers, we are bound by a responsibility to use the taxpayer's money wisely. It is not realistic to think we can arbitrarily devote funding to such a program expansion. The suggestion from Chief Mosley to explore grant opportunities should be considered to help support this program.

The internal assessment was quite revealing. I found that our organization has quite an equipment cache. I also found that we have several personnel within the organization with specialized training in this discipline. This internal assessment also led me to believe that we are not well organized. We have a good inventory of equipment; however, we are lacking some very important PPE. The department has not provided any type thermal or contamination protection. It is easy to assume that this limits our response capabilities. It is my opinion that we would put our personnel in extreme risk without this PPE. A rescuer would quickly become a victim if exposed to cold-water temperatures without proper thermal protection.

The internal assessment revealed that we have done a poor job of managing our resources. We have talented individuals with specialized training for water rescue. This training includes skills such as swiftwater rescue

technician and training for dive operations. Examining our station assignments, we found that we only have two (2) individuals stationed with the water rescue equipment. In addition, two (2) individuals at this station that are known to be non-swimmers. This means our first due water response station is responding with a lack of trained personnel to deploy in a timely manner. In the situation of the non-swimmers, we have put them in a potentially hazardous situation by assigning them to this station.

To summarize this project and its work towards a capability assessment we have found:

1. There are ample resources available from the NFPA, FEMA, and other State and local agencies that an organization may use as a guide for developing a water rescue team.
2. WFRS has a good basis of equipment for water rescue response; however, the lack of thermal protection and contamination protection increases the risk to rescuers. This limitation must be considered when developing strategies for water rescue events.
3. WFRS has the personnel trained to build a small response team. We have nine (9) personnel with water rescue certifications and nine personnel

with SCUBA training. We are lacking a structured organization for optimal use of these talents.

4. We found that the State of North Carolina has an unbalanced level of resources for water rescue. The study from NCEM indicates we have heavier saturation of resources in the western portions of the State. Competition for resources in the eastern portions of the State can be expected in the event of a widespread natural disaster.
5. This research found that we have resources in our jurisdiction that can supplement water rescue responses. These resources have response time and standard of cover limitations that must be considered.

This research has indicated to me that WFRS has some limited capabilities for responding to water rescue events. The agency does not meet federal or state recommendations for water rescue teams. The agency lacks some essential PPE needed to reduce the risk to rescuers. The water rescue certifications held by those in the organization are compliant with applicable NFPA standards. The divers in the organization have nationally recognized certifications.

Recommendations

The overall scope of this research project was to conduct a water rescue capability assessment. This research found that our agency has some limited capabilities for water rescue; however, improvement is needed. Recommendations for this project include an improvement plan to overcome the identified deficiencies.

The research found that our agency has a good foundation of equipment and trained personnel. Based on the interview with Chief Mosley, the department has a vision to expand this service. The agency has not done well organizing a formal team for this service. The agency lacks some critical pieces of PPE for responders. Lacking these critical pieces of PPE limits our ability to operate safely in many situations.

Based on this research, I recommend WFRS leadership staff consider the requirements to meet the FEMA Type II team standard. This research project has shown that the FEMA Team Typing Guide is a useful resource to define a water rescue team, based on team size, capability and equipment inventory. The NFPA standards should be used as a reference to guide the professional qualifications and training for the team members.

The internal research found that we have ample personnel to meet and exceed the minimum six (6) member requirement for the Type II team. The requirements for the Type II team require the team be equipped and trained for SCUBA operations. It also requires personal protective equipment that includes dry suit protection for the SCUBA personnel. The department will need to obtain this additional equipment based on the Type II standard. Equipment such as underwater communication system, flares, markers, and aircraft radio are not presently found in the department's inventory. Training to meet the Type II standard would need to expand to include animal rescue, helicopter operations, and public safety dive training for the SCUBA personnel.

Using the Type II team standard as a goal, the organization will have a clear path to meet an objective. Compliance with this team standard may also provide an opportunity for the agency to receive the credentials available from NCAREMS. To obtain the credentials the organization will be required to seek membership with this statewide organization.

It was evident when interviewing Chief Mosley that our leadership staff is always vigilant about the use of taxpayers' money. Adopting a very aggressive goal may

cause a financial hardship on the organization. Because of this, I recommend that the organization seek grant-funding opportunities to help develop this program. I also recommend the agency seek support from area civic groups. Based on the information received from the Wilson County Sheriff's Office I do not recommend we depend on our personnel to supply their personal equipment. The Wilson County Sheriff's Office has experienced a reduction of team members due in part to hard economic times. One may consider this as a potential outcome for our organization if we choose this option. This is not the sustainability desired for this program.

A timeline for reaching this goal should be adopted. The timeline must be realistic and achievable. Based on this research project I recommend the department adopt an action plan that involves expanding this program in phases.

The initial phase would include formally adopting a goal of FEMA Type II water rescue team in the department's strategic plan. This phase of the project can be completed by June 30, 2011. To achieve this goal, the findings of this research will be presented to the leadership staff. These findings will present our current state of readiness. The strengths of the organization will be identified along with the weaknesses.

The second phase would be to seek contributions and/or allocate funding to support this program development. This funding is necessary to purchase equipment to complete the Type II team equipment inventory. This phase of the expansion can be completed by the end of December 2011. By moving this phase of the expansion beyond July 01, 2011, the department has time to implement it into the annual budgeting process. During these expansion phases, the departmental members can attend water rescue re-fresher courses as continuing education.

The final phase of this project would be formally organizing a specialized team. This formal step would help identify those personnel with the special skills needed to safely conduct water rescue. The goal of this is to overcome the staffing issues identified from this research. Once the formal team is established, the department can balance the staffing on all three (3) shifts. A computer aided dispatch communication medium can be used to activate the team for situations requiring the re-call of off duty members. This communication medium is already available through the emergency communication center and is used regularly for fire related emergencies. Based on this research, I recommend that our neighboring city, Rocky Mount, NC, be used as a model program to guide this

development. This phase of the expansion project can be completed by the end of December 2011.

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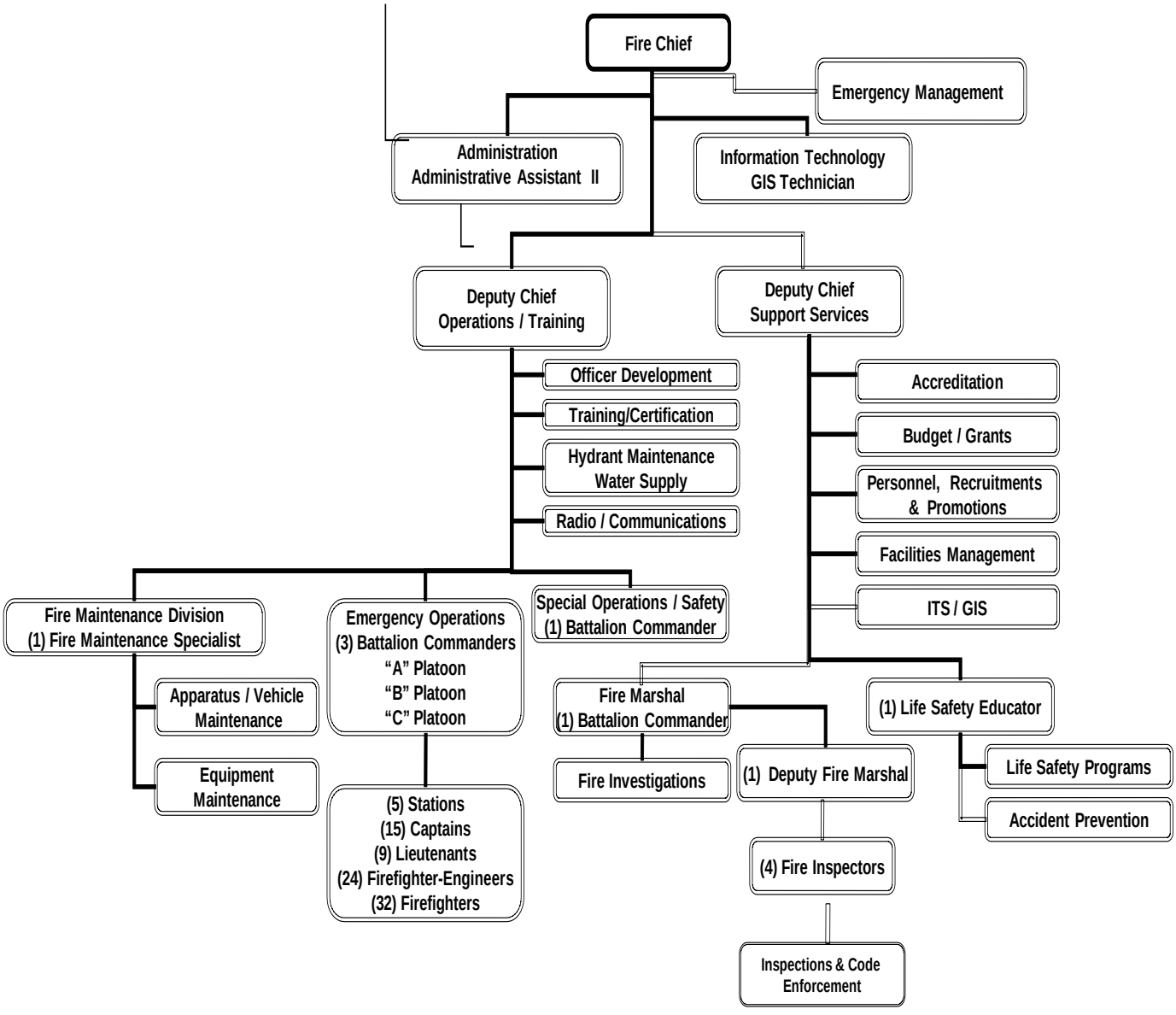
Appendix A

WFRS Organizational Chart

WILSON FIRE/RESCUE SERVICES ORGANIZATIONAL CHART



Appendix B

NCAREMS Swiftwater Equipment List

SWIFTWATER RESCUE EQUIPMENT REQUIREMENTS

1. Adequate water rescue rope (polypropylene rope that floats) for the authority having jurisdiction.
2. Watercraft suitable for the authority having jurisdiction.
3. Adequate water rescue recovery equipment for the authority having jurisdiction.

Personal protective equipment to include the following:

____ 8 pr. Gloves (leather palm minimum)
____ 8 ea. Full body thermal protection recommended (May Be Wet or Dry Suits)
____ 8 ea. Swiftwater Rescue Vest PFD, Type III/V, U.S. Coast Guard approved
____ 8 ea. Water rescue helmets
____ 8 ea. Whistles
____ 8 ea. Water rescue knives
____ 8 ea. Chemical Light Sticks
____ 3 ea. Aerial Flares
____ 3 ea. Dye Markers
____ 3 ea. Dry Gear Bags
____ 3 ea. Flashlights (w/Spare Batteries)
____ 3 ea. Handheld Flares
____ 3 ea. Smoke Marking Device
____ 3 ea. Appropriate Water Shoes
____ 6 ea. Rope (floating) 3/8 in. x 50 ft., water rescue throw bags
____ 1 ea. Rope, 7/16 in. x 300 ft., 5000 lb., water rescue rope w/bag
____ 16 ea. Aluminum carabiners - (non locking)
____ 16 ea. 5mm x 4-ft. low stretch (static) Prussik Cord (2 per vest)
____ 1. ea. 18 in. Type IV Throwable Device
____ 1. ea. Hose Inflator Kit (may be commercial or homemade)
____ 1. ea. 100 ft. 1 1/2 Fire Hose
____ 1 Set of Incident Command Forms PER AHJ Download These at:
http://www.nimsonline.com/download_center/index.htm#forms

5. NIMS TYPING INFORMATION:

This standard currently meets NIMS Typing Criteria IV. Organizations wishing to certify at a higher level must meet the additional requirements for personnel, training and equipment. To locate this information cut and paste the following link into your web browser. Under the heading of “Search and Rescue” locate “Swiftwater/Flood Search and Rescue Team” and follow the specific guidelines.

http://www.fema.gov/pdf/emergency/nims/508-8_search_and_rescue_resources.pdf

Per the NIMS “Swiftwater/Flood Search and Rescue Team” document, in order to locate the various quantities of each equipment item, please reference the FIRESCOPE Swiftwater/Flood Search and Rescue definition at:

http://www.firescope.org/ics-usar/ICS-SF-SAR-020-1.pdf

Appendix C

WFRS Training Survey Form (Blank Copy)

Wilson Fire and Rescue Services
Training Division
Certification / Skills / Education Survey

The WFRS Training Division is trying to track employee's skills, certification and education credentials through the Fire Central records management software (RMS). Each employee needs to complete this survey to ensure accurate information is recorded. Please be sure to read thoroughly and complete all parts. Expiration dates should be confirmed by the employee's certificate before being recorded on this survey. Please contact the WFRS Training Division with any questions on this survey.

Formal Education			
School Name (i.e. Barton, Mt. Olive, UNC-C, ECU, WTCC, etc…)	Year Graduated	Degree Earned	Course or Field of Study

Certification and Skills – Please check all that apply.			
	Spanish Interpreter		Certified Fire Arson Investigator
	NC Instructor Level II		NC 1403 Live Burn Instructor
	NC LP Gas Instructor		NC Driver Operator
	NC Rescue Technician (or TR)		Surface/Swift Water Rescue Technician
	NC Life Safety Educator I		WFRS Officer Development – Complete
	NC Life Safety Educator II		WFRS Acting Officer
	NC Life Safety Educator III		SCBA Technician
	NC D/O Pump Instructor		NC D/O Aerial Instructor
	CPR Instructor		Child Passenger Safety Seat Tech.
	NC EVD Instructor		ICS-NIMS Instructor
	NC Rescue Technician Instructor		Certified SCUBA Diver
	HazMat Operations (OSHA Tech included)		NC HazMat Instructor
	NC HazMat Technician (NC State Tech Only)		Hazardous Materials WMD-CBRN
	NFA Executive Fire Officer Graduate		CFOD
	Unified Command and Control		ICS 100-200
	ICS 300		ICS 400
	Confined Space Instructor		Trench Rescue Instructor

Medical Certification:

MR_____ EMT-B_____ EMT-P_____

Expiration Date for medical certification_____

Fire Inspector Certification:

Level 1 Standard _____ Level 2 Standard _____ Level 3 Standard _____

Level 1 Probationary _____ Level 2 Probationary _____ Level 3 Probationary _____

Probationary Certificates must include expiration date:_____

Other Certifications/Skills (please attach a separate as needed):

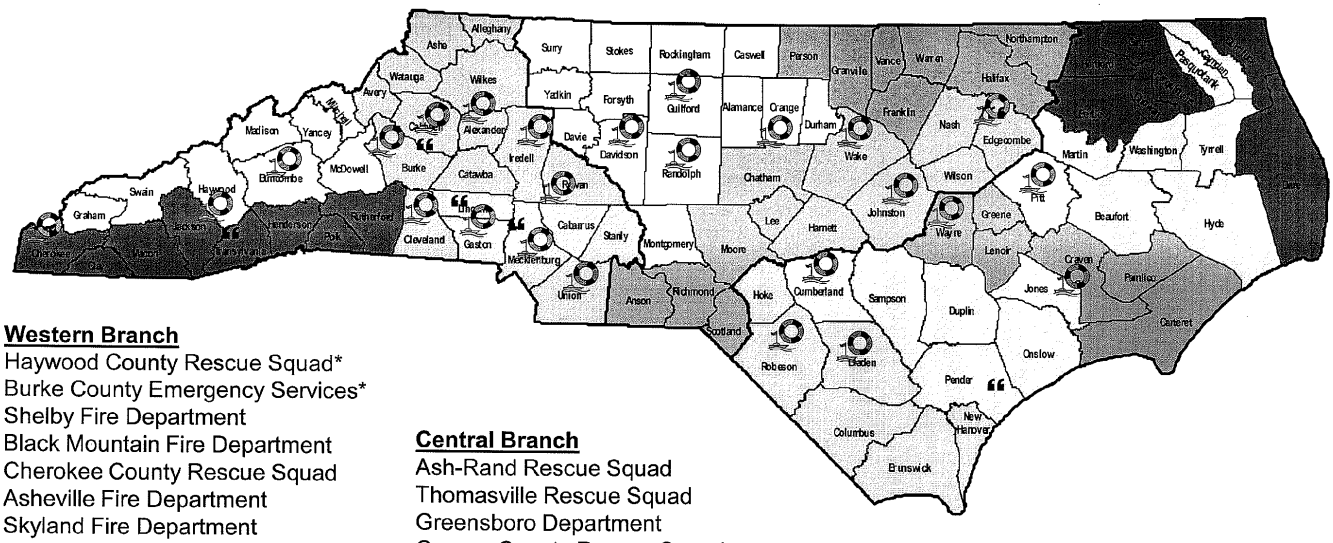
Description/Title	Certification Date	Expiration Date

Appendix D

NC Emergency Management Flood/Swiftwater Rescue Team Map

North Carolina Division of Emergency Management

Flood/Swiftwater Rescue Team Locations



Western Branch
Haywood County Rescue Squad*
Burke County Emergency Services*
Shelby Fire Department
Black Mountain Fire Department
Cherokee County Rescue Squad
Asheville Fire Department
Skyland Fire Department
Gaston USAR Team
Alexander Rescue Squad
Monroe Fire Department
Charlotte Fire Department*
Rowan Rescue Squad
Lenoir Rescue
Midland Fire Department

Central Branch
Ash-Rand Rescue Squad
Thomasville Rescue Squad
Greensboro Department
Orange County Rescue Squad
Rocky Mount Fire Department*
REDS Team (Wake Co.)
Johnston County Sheriff's Team

Helicopter Rescue Technicians* “

Eastern Branch
Lumberton Rescue Squad
Hope Mills Fire Department
New Bern Fire Department
Pitt County Sheriff's Swiftwater Rescue Team
Bladen Water Rescue Team
ARR-MAC Water Response Team