Developing the City of Statesville Community Risk Assessment Procedure

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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 indicated, and appropriate credit is given where I have used language, ideas, expressions, or writing of another.

Signed: ________________________________
Abstract

The Statesville Fire Department takes pride in being a modern all-hazards fire department. As part of that mission, in 2009 the Statesville Fire Department developed a community risk assessment for the City of Statesville. Fire department personnel collected data, identified threats and hazards, and then documented the results. The problem was the Statesville Fire Department did not have a comprehensive method for updating the community risk assessment. The purpose of this research project was to develop a local process for updating the Statesville Fire Department’s risk assessment. The action research method was used and the following questions were answered: a) What are the nationally recognized standards for community risk assessments? b) Does the current risk assessment meet the nationally recognized standards for risk assessment? c) How can the Statesville Fire Department improve on conducting community risk assessment? d) Who should complete the community risk assessment? These questions were answered through a literature review, interviews, review of the current risk assessment, and data sharing. Further, information was gathered to develop a procedure which will be used to update City of Statesville community risk assessment. Recommendations include implementing the policy developed, creating an employee notification system, and inserting current census data to the current risk assessment.
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Developing the City of Statesville Community Risk Assessment Procedure

The Statesville Fire Department is constantly striving to remain a modern fire department. In today’s fire service, planning is an important component of this constant effort. Since 2007, several measures have taken place such as strategic planning, development of standards of cover, creating annual reports, and starting the Center for Public Safety Excellence fire service accreditation process.

In 2008, the Statesville Fire Department (SFD) began the process of developing a community risk assessment for the City of Statesville, North Carolina. A comprehensive community risk assessment had never been conducted in the City of Statesville. The project was complete in 2009 and established logical planning areas based upon a number of factors, including the typical hazard in an area and response time capability of the organization. The assessment project was new to the organization and ultimately provided information never before documented by SFD.

The problem is the Statesville Fire Department does not have a comprehensive method for updating the community risk assessment. The purpose of this research project is to develop a local process for updating the Statesville Fire Department’s risk assessment. The action research method will be used and the following questions will be answered: a) What are the nationally recognized standards for community risk assessments? b) Does the current risk assessment meet the nationally recognized standards for a community risk assessment? c) How can the Statesville Fire Department improve on conducting community risk assessment? d) Who should complete the community risk assessment? Finally, based on the research outcomes, a procedure will be developed for updating the SFD community risk assessment.
Background and Significance

The City of Statesville is 23.72 square miles with a population of 27,311. Statesville is located in the foothills of North Carolina or the piedmont region. The dedicated members of the Statesville Fire Department are charged with providing fire and rescue service for the citizens of Statesville. These services include: fire suppression, heavy vehicle extrication, aircraft rescue and suppression, confined-space, hazardous material response, technical rescue, and basic life support assistance.

The SFD is divided into three divisions: suppression, fire and life safety, and administration. Suppression is the largest division with 66 personnel. The fire and life safety division has four personnel which include an assistant chief, captain, lieutenant, and an administrative assistant. These two divisions are led by the administrative division. The administrative division includes the fire chief, the deputy chief of administration, the deputy chief of operations, and an administrative assistant.

Each division, and the members of those divisions, protects a community which rests forty miles north of Charlotte which is the most populated city in North Carolina. Statesville is considered a bedroom community for the large city. This generates a large amount of vehicle traffic. In fact, Statesville is home to the third most traveled interchange in North Carolina. The Interstate 40 and Interstate 77 interchange is estimated to have over 100,000 motor vehicles per day pass through (NCDOT, 2012).

The members of the SFD respond to an average of 3200 emergency incidents per year. They prepare for those emergencies through training and preparation. The members follow the mission statement: “The Statesville Fire Department is dedicated to the safety and protection of our community’s quality of life from all hazards through a well trained, professional, rapid
response team, seeking opportunities to serve and placing others before self” (SFD Strategic Plan, 2011).

In early 2008, the SFD began developing a plan to provide the most efficient fire service possible while remaining cost effective. The department began by reviewing the vision statement provided by the City of Statesville to determine community needs and expectations. Multiple community forums were used to develop the city’s comprehensive plan. The department began developing multiple committees in the spring of 2008, one of which was the strategic planning committee. Several members encompassing all ranks were interested in serving on the newly formed team which began meeting shortly thereafter. Multiple meetings and correspondence developed the new mission, vision, and value statements.

These statements would now drive all future decisions made by the department. Several strategic initiatives were created and a draft of the plan was presented to all fire department chief officers and committee members in July, 2008. Each of the strategic initiatives had desired goals with action steps to assist meeting the goals. Each initiative was assigned a responsible chief officer. The individual goals were delegated to the membership of the organization. A vision centered management process would now be used and incorporated into the department’s annual work-plan. The individual divisions, operations and administration, coordinated to implement the plan. An annual review of the strategic plan is conducted by the chief officers and strategic planning committee (SFD, 2011).

A comprehensive community risk assessment had never been conducted in the City of Statesville. This task was undertaken in early 2009 and was the first comprehensive study to establish logical planning areas based upon a number of factors including the typical hazard in an area and response time capability of the organization. Fire demand zones (FDZ) were created to
facilitate the study. FDZ’s were originally based off census tract data but the areas were determined to be too large to be used for response protocols. Fire Department staff then created smaller geographical areas that could be used for dispatching as well as completing the desired risk analysis.

Geographic growth and a new focus on the effectiveness and efficiency of the services provided for the community has led the SFD to analyze each zone. Fire station 4, opened in July, 2012, created the need to study response patterns for the entire city and to determine proper distribution of first due resources. This hazard and risk analysis also provided insight into performance objectives based upon critical tasking and established standards of coverage statements as policies to guide the organization in future planning and service delivery (SFD, 2011).

The purpose of this study is to identify and evaluate the community risks within the service area boundaries of the City of Statesville which may require a response SFD. The risks determined are based upon worst case scenarios and adjusted by actual historical experience. The study also identified critical tasks associated with each risk. The resources necessary to accomplish critical tasks are established based upon the typical scenario. Policy statements created in the standards of coverage document now guide existing and future decisions based on service level objectives and resource concentration and deployment.

The methods used in conducting this study were strongly influenced by the recommended guide from the Center for Public Safety Excellence, Self-Assessment Manual, 8th edition and Standards of Cover, 5th edition. Community risks were evaluated on three levels: 1) the community as a whole; 2) the service demand zones; and, 3) specific occupancies. The jurisdiction is divided into 212 emergency planning areas the SFD terms fire demand zones.
These zones concentrate on small manageable areas to determine such things as typical occupancy, service risks and timed response capability while honoring certain geographic obstacles such as existing roadways, natural and manmade barriers. Data was collected using a number of sources and methodologies. Extensive building and occupancy information was available in the Fire Records Management System and inspection data from the Fire & Life Safety Division. This information was used to establish potential fire risks based upon occupancy type for the community as a whole. Individual properties were evaluated for occupancy hazard classifications using NFPA 13 and NFPA 101 descriptions. A survey of every emergency planning area was conducted by on-duty fire companies and light duty staff personnel to identify typical and special risks, and evaluate occupancy hazard, life hazard, life exposure, typical facility size, required fire flow, available water, and response time capabilities to an established focal point.

Historical experience was determined by analyzing incident report data stored in the fire records management system and existing knowledge of tenured personnel. Actual response experience was evaluated on two levels: 1) the community as a whole; and, 2) the emergency planning area. Concentration and distribution were evaluated using GIS software from the City of Statesville Engineering Department. The response time models for various hazards were established using data from incident reports, field study, and GIS research.

The planning zones created and surveyed, cover all the incorporated areas in the City of Statesville. The purpose of the planning areas was to identify small manageable areas with similar occupancy types or form. These small areas are then used in determining the risks and the development of response plans. For the purpose of this study engine company personnel used a number of factors to evaluate every planning area. These factors include:
• Evaluate travel time.
• Evaluate critical or typical fire hazard (occupancy).
• Evaluate critical or typical life hazard (occupancy).
• Evaluate critical or typical life exposure (number of people).
• Evaluate critical or typical facility size.
• Determine critical or typical required fire flow.
• Determine available water.
• Evaluate adequacy of available water.
• Determine overall area risk score (Low, Moderate, High, Special).
• Identify the critical or typical risk.
• Presence of a high-rise structure.
• Presence of an airport
• Presence of a hazardous chemical location.
• Presence of a significant Historical/Cultural location.
• Presence of a Highway (Interstate I 77 & I 40)
• Presence of a railway

An evaluation of the potential risks was identified in the City of Statesville city limits and was based upon occupancy classification along with the fourteen factors mentioned above. To facilitate the assessment of planning areas, a preliminary determination was made regarding what risks were in the area. An evaluation of each factor provided a clear picture of what type of potential hazards occur and where these hazards were located by planning area. The data analysis section of the community risk assessment document shows the evaluation of each of the 14 factors.
The National Fire Academy Executive Fire Officer Program has certain expectations for an applied research project. One such expectation is relating the applied research project to the United States Fire Administration’s 2010-2014 Strategic Plan. Community risk assessment research supports operational goals one through three found within the strategic plan. The first goal is to “reduce risk at the local level through prevention and mitigation”, the second goal is to “improve local planning and preparedness”, and the third goal is to “improve the fire and emergency services’ capability for response to and recovery from all hazards” (USFA, 2010, p.3). Risk assessments are designed to meet each of these goals particularly for local jurisdictions. In addition, risk assessments indentify roles whereby local jurisdictions can assist state and national agencies.

**Literature Review**

The American fire service is charged with keeping the homeland safe from fire, hazardous materials incidents, vehicle crashes, and just about every other emergency you can think of. Every firefighter trains and prepares for these incidents and for the most part training is consistent across the United States. So, what separates an emergency incident in rural North Carolina from an incident in New York City? The answer is weather, building construction, topography, water supply, life hazards, and staffing levels. Basically, preparation directly correlates to the fire service’s ability to mitigate emergencies.

We often hear the common but broad terms risk assessment; risk reduction, risk analysis, risk management and community risk assessment. For the purpose of this applied research project, community risk assessment, or simply risk assessment, will be used and defined as: “the process of gathering and analyzing information about the community and its risk” (EACRR, 2011). This process and procedure provides the necessary information so firefighters have the best opportunity to mitigate emergencies.
Though the definition may seem simple, the process and methodology can be quietly complex. First, the probability and frequency of hazards occurring must be researched. Second, possible exposure of citizens and property to the hazards must be identified. Finally, a method for assessing the direct and indirect cost should be developed. Methods for acquiring data can be quantitative or qualitative but it is important the data is accurate (Haddow, Bullock, and Coppola, 2008). Basically, the risk assessment is only as good as the data used to create the assessment.

Risk assessments are becoming increasingly important; thus state governments around the country are evaluating methods for dealing with them. In this year’s legislative session New York Senator Jeffery Klein proposed the creation of a New York State Office of Risk Assessment. Four other states are expected to follow. In 2011, natural disasters such as Tropical Storm Lee, Hurricane Irene, and the Texas wildfires, brought emergency management and risk assessment to the forefront once again. Lawmakers began asking questions focused around forecasting risk, risk management, and public risk pools (Tsikoudakis and Zolkos, R, 2012).

Risk assessments have become such an integral part of emergencies services that the United States Department of Homeland Security (2012) has created a risk assessment guide. The guide highlights the obligation of every community to understand their risk, hazards, and threats. A pitfall of many risk assessment models is tunnel vision. For example, many fire departments believe a good preplan program serves as a risk assessment. Unfortunately, fire service preplanning or pre-incident analysis only identifies the risk and some will research water supply, building construction, and geography. It does not consider historical data, service demand, census data, transportations networks, or emergency incident probability. A proper risk
assessment should attempt to understand, qualify, and quantify all risk and consider before and after consequences (United States Department of Homeland Security, 2012).

Community risk assessments are thorough documents intended to be specific to the jurisdiction. This means every risk assessment will be different. A department beginning an assessment should first form a committee to complete the study. It is ideal for the committee to have a member from each rank with one clear leader. Once the committee is established, assignments should be divided amongst the committee. Further, the committee may need others within the department to assist (Barr and Eversole, 2006). For example, departments with specialty teams such as hazardous materials companies may assign those companies to researching hazardous materials found within the community.

Obviously, even in a small jurisdiction a community risk assessment is a large project and systematic approach must be used. One of the many approaches to developing a risk assessment is Threat and Hazard Identification and Risk Assessment Guide or THIRA. THIRA is a five step process. Step 1 identifies threats and hazards using past experience and forecasting. Once the hazards and threats have been identified, in Step 2, they must be put into context. Considerations would be population, weather, time of day, and location. Step 3 illustrates how the hazards and threats could potentially affect the community. Step 4 sets clear desired outcomes and core capabilities if the potential risk becomes a reality. Finally, in Step 5 all the data collected in Steps 1-4 are used to develop prevention, mitigation, response, and recovery plans (United States Department of Homeland Security, 2012).

The International Association of Fire Chiefs (IAFC) states modern all-hazards fire departments must have the ability to mobilize resources quickly and respond to all emergencies. To accomplish this, a formalized risk assessment is necessary. Formalizing your community risk
provides a foundation to build a rapid response plan which often requires mutual aid especially
to small organizations. The IAFC recommends first reviewing historical demands for service. Or,
what past indicators can help predict future risk and demands? The second step is to indentify
critical infrastructure. This includes government agencies, transportation, religious assemblies,
major employers, and public utilities. Consider if one or more of these services were to become
disabled then develop methods for dealing with the associated problems. Next, document the
natural disasters and the probability of those disasters occurring in your community. Once
natural disasters are recorded, begin reviewing how disaster could affect your community. For
example, if flooding occurs how does the fire department respond? Finally, all of this
information must be compiled in one place. Members of all the involved agencies most use the
risk assessment as a working document (LeDuc, 2012).

Many fire service agencies across the United States are involved in the Center for Public
Safety Excellence’s (CPSE) fire service accreditation program. The fire service accreditation
program is administered by the Commission on Fire Accreditation International (CFAI) which is
a division of CPSE. Standards of Cover (SOC) is a CFAI term but the concept is a fundamental
piece of every type of accreditation from education to emergency services. Standards of Cover is
a rational and systematic way of looking at the base service provided by a fire protection agency.
The purpose of the SOC is to provide a system which will assist in assessing community fire and
non-fire risks, defining baseline and benchmark emergency response performance standards,
planning future station locations, measuring service delivery performance, and supporting
strategic planning and policy development relative to resource procurement and allocation (CFAI
2008).
Community risk assessment is the second step within the SOC process. Though the SOC is an extensive process, risk assessment is considered the most difficult and the most important component. CFAI states: “If the risk is not properly assessed, the entire process will be suspect in its conclusions” (CFAI, 2009, p.23). Essentially, community risk assessment is the foundation for the accreditation process. The risk assessment ensures specific research and observations are completed on the jurisdiction’s physical, economic and sociologic, demographics. Key factors included in the assessment are building fire problems, mobile fire problems, and non-structural hazards. Population factors should look at current census data and any data the jurisdiction may use to track population trends (CFAI, 2008).

CFAI explains physical risk factors as geospatial, topography, transportation, and disaster exposures. Each factor has specific potential risk associated. For example, disaster exposure includes floods, wildland interface, wind events, critical infrastructure, and key assets. It is important to examine the possibilities but history of weather conditions is considered the best indicator. If an earthquake has never occurred within a jurisdiction, it should be considered a low risk and low probability (CFAI, 2008).

Each jurisdiction has different service demands and tracking those demands is essential. Incident call type, frequency of calls, and call location are considered the pertinent components of service demand levels. Agencies developing a risk assessment must have a records management system and the system must allow data to enter and exit with accuracy. The ability to track service demand directly correlates to staffing. In the fire service, staffing is considered not only the number of firefighters on-duty but the location of those on-duty firefighters. A high call volume in a specific location is identified by tracking call location. An agency could use this information to increase staffing in that specific location (CFAI, 2008).
This information guides the development of response plans to each risk category. The outcome of this matrix shows the response resources must match the risk levels determined. At a minimum, resources must be provided to meet the medium risk category such as a residential fire, which is a highly probable event. Additional considerations must also be given to the existing practices that maintain events in the special risk category, manufacturing. Basically, the response plan needs to illustrate a method for mitigated an incident in a special risk category (CFAI, 2009).

Fire service professionals often view risk assessments as a means of preparation and planning but public administrators have a different view. They analyze issues through the eyes of revenue or the lack thereof (LeDuc, 2012). A storm destroying multiple power lines and stalling transportation would be detrimental to a small municipality. The city would lose power revenue and also have to fund the efforts to restore services to the citizens. Any delay in transportation keeps citizens from shopping in local stores, eating at local restaurants, getting to and from their place of employment, and prevents tourist from the city. Obviously, the city must cover the cost for repairing the transportation system.

Preparation is essential in the fire service. Training, planning, and budgeting are constant processes of the profession. Typically, citizens do not see this aspect of the profession. They expect someone to respond and make the situation better. This is true with small emergencies and large natural disasters. Of course, large disasters are more complicated and more resources are required to improve the situation. Though again, citizens expect the emergency workers to respond and fix the problem. For the fire service, this means everything possible must be done to prepare for every type of emergency in order to meet the citizens’ expectations and most
importantly keep them safe. Risk assessments are important to the overall process (Crabtree, 2009).

Literature Review Summary

In summary, the purpose of this applied research project was to evaluate the process of community risk assessments and more specifically attempt to develop a procedure for the City of Statesville. The literature review focused on the four research questions: a) What are the nationally recognized standards for community risk assessments? b) Does the current risk assessment meet the nationally recognized standards for risk assessment? c) How can the Statesville Fire Department improve on conducting community risk assessment? d) Who should complete the community risk assessment?

Community risk assessments start with compiling historical data and service demand statistics. The data should consider population, demographics, and geography. Hazards and threats should be identified by examining infrastructure, transportation networks, hazardous materials storage, and populated areas. Once these details are identified, document the information so it can be used.

The literature illustrated the United States Department of Homeland Security and CFAI both have community risk assessment models which are being used nationally. Each individual model though somewhat different stresses the importance of following a specific step-by-step process. Emergency agencies across the United States use the models to prepare risk assessments for their communities. Community risk assessments are unique to the individual community but the process can be applied in most jurisdictions.

Procedures

Efforts on research for this applied research project began in March of 2012 at the National Fire Academy (NFA) Learning Resource Center (LRC), in Emmitsburg, Maryland. The
LRC online database was utilized to search key terms: risk reduction, risk analysis, risk management and community risk assessment. Other written documents were examined including Statesville Fire Department Community Risk Assessment, Iredell County All Hazards Plan, and other agency’s community risk assessment documents. This research was used to write the background and significance and the literature review.

The literature review was used to establish a foundation to begin answering the following research questions.

(a) What are the nationally recognized standards for community risk assessments?
(b) Does the current risk assessment meet the nationally recognized standards?
(c) How can the Statesville Fire Department improve on conducting community risk assessment?
(d) Who should complete the community risk assessment?

The second research procedure was an interview with David Bullins, Fire Chief, City of Statesville and Rob Hites, City Manager, City of Statesville. These two individuals were selected due to their roles and responsibilities with the Statesville jurisdiction. Further, both have unique experience which adds to the research. The below questions were asked:

- When did community risk assessment begin in the City of Statesville?
- Who do you feel should complete the assessment?
- What risk assessment model should be used in the City of Statesville?
- How often should the community risk assessment be updated?
- What, if any, role does other city departments play in the risk assessment process?
- Are there other changes not discussed above that need to be considered?
Manager Hites and Chief Bullins spent approximately a half our each answering questions concerning the future of City of Statesville risk assessment. Both had expectations and viewed the future needs similarly. The entire interviews are located in Appendix A and Appendix B.

The third procedure involved was requesting information from the North Carolina Accreditation Support Consortium NCASC. Currently, there are fourteen CFAI accredited agencies in North Carolina with an additional twelve departments striving toward accreditation. These twenty-six fire departments participate in NCASC. The goal of NCASC is to help non-accredited agencies reach their goal of accreditation and assist accredited agencies with reaffirmation (CFAI, 2012). NCASC was chosen due to their involvement with community risk assessment.

NCASC uses several methods to assist their members. One such method is the use of a Microsoft based web-hosting site called SharePoint. The website was originally setup by CFAI for NCASC and CFAI continues to provide NCASC server space. SharePoint allows members of the consortium to post documents, discuss accreditation issues, and share policies and procedures. I sent an email on June 24, 2012 to each consortium member requesting they post information on their individual risk assessment process. The details of that request can be found in Appendix C.

The next procedure involved a thorough review of the City of Statesville’s current community risk assessment. Review of the document was necessary to answer the second research question. The content of the City of Statesville risk assessment was compared to the CFAI risk assessment guidelines.
The final procedure was to develop a method for updating the community risk assessment. The procedure encompasses information ascertained from the literature review, interviews, and NCASC group. The completed document was presented and approved by Fire Chief David Bullins and City of Statesville City Manager Rob Hites. The completed document can be found in Appendix D.

Limitations for this applied research project were few but two main limitations did emerge. First, community risk assessments are different in every jurisdiction. The literature review clearly highlighted the importance of community risk assessments. However, each assessment is unique to the jurisdiction therefore only the process could be evaluated. Examining others risk assessment documents only proves the model works in that particular jurisdiction. It does not necessary prove it will work for the City of Statesville. The interviews with city leaders proved the CFAI model works well for the City of Statesville but the only sound way to evaluate other risk assessment models is to apply those models. Further, the models evaluated from NCASC were all CFAI models which is likely due to using an accreditation support consortium as the sample. It would have been possible to use other agencies or samples but agencies involved in the accreditation process were most likely to have completed a community risk assessment.

The second limitation was identified while conducting the literature review. Risk assessment, risk management, risk analysis, risk pool, community analysis, and threat identification all are terms that must be researched. These are terms used in insurance, manufacturing, private businesses, and emergency services. Though many applied research projects use private industry as examples, this topic is specific to emergency services. The
literature is limited to the importance of risk assessments and the explanation of models currently being used in emergency services.

Results

The results of this applied research project provided sufficient information to answer the four research questions. This was accomplished through a literature review, interviews, review of the current risk assessment, and data sharing. Further, information gathered led to the development of a procedure which will be used to update City of Statesville community risk assessment (Appendix D).

Research question one asked: What are the nationally recognized standards for community risk assessments? The literature review revealed two models currently being used around the United States. Each of these models has proven effective in most jurisdictions. The first model identified is the Threat and Hazard Identification and Risk Assessment Guide or THIRA. The model was designed by United States Department of Homeland Security and utilizes a five step process. These steps include threats and hazards forecasting, data collection, context identification, potential affects, and mitigation (United States Department of Homeland Security, 2012).

The second model is the CFAI community risk assessment model. CFAI feels it is important to identify service demands using historical data and experience. The use of an effective and efficient records management system is essential. For the assessment to be accurate, the data used for the risk assessment must be accurate. Next, examine physical risk factors such as geospatial, topography, transportation, and disaster exposures. Finally, the CFAI probability matrix is used to determine the likelihood events may occur. This gives the agencies the tools to prepare for risk within their community.
The second research question was: Does the current risk assessment meet the nationally recognized standards for risk assessment? A comparison review was conducted to ensure the necessary components were present in the City of Statesville’s current risk assessment. Fortunately, the current risk assessment does meet the recognized models. As discovered in the interview, Chief Bullins began the process based on his prior experience with the CFAI accreditation process. Further, an accreditation team was established and those members worked closely with Chief Bullins to complete the process.

The current community risk assessment, illustrates the City of Statesville appears to have risks both small and large, some are low and some are high frequency. The Fire Department should be prepared for fires in single family residential structures while also having resources planned for mid-rise and industrial structures. Fire stations and apparatus should be equally distributed throughout the community to provide an initial intervention team but placing the full effective response force in reasonable locations to meet the needs of the City of Statesville.

The literature review revealed CFAI, FEMA, and IAFC all believe certain components should be included in a community risk assessment. Each of these agencies researches, evaluates, and improves upon risk assessment models. Though their models are different, the components needed to create an effective risk assessment are relatively the same. The City of Statesville’s community risk assessment contains the needed component (City of Statesville Community Risk Assessment, 2009).

The third research question was: How can the Statesville Fire Department improve on conducting a community risk assessment? This was mainly answered from data sharing with NCASC. Of the twenty-six NCASC members, fourteen shared their actual risk assessment document. Those documents revealed numerous methods for completing each subsection
outlined by the CFAI model. In Carrboro, North Carolina, a town comparable in population to City of Statesville, a notification system was developed for all town employees. If a natural disaster type emergency occurs, it will be important to contact administrators, planning officials, and public works employees. Currently, the plan does not include a notification system (Town of Carrboro, 2011).

The City of Wilson, North Carolina uses software titled VISION to assist with their community risk assessment. The Wilson Fire Department reports they are responsible for conducting the city’s risk assessment and the VISION software allows them to compare data to other agencies, plan resource deployment for a myriad of situations, and measure response effectiveness (Wilson Fire Department, 2011). VISION is web based software that can be accessed from anywhere. It was a Google maps upgrade which tracks incidents by location and occupancy type, maps and color-codes hydrants by gallons-per-minute per NFPA 291, and allows street level views via satellite (emergencyservices.com, 2012).

In an interview with Fire Chief David Bullins (Appendix A), he explained the fire department needs a software or data base for updating in real time. The fire and safety division currently has a list of business which is used for preplanning businesses but the risk assessment is not correlated to the list. He believes a data base can be created and used to update the risk assessment as new hazards arrive.

Finally, only three of the fourteen agencies reviewed actually have a procedure. Most of the agencies explained their risk assessments were completed only every five years in accordance with their CFAI reaffirmation process. Battalion Chief Commander Ben Smith reports Wilson Fire Department’s procedure involves updating its City of Wilson community
risk assessment on an annual basis. This fits with the departments belief that accreditation is an ongoing process (Smith, 2012).

Mooresville Fire Department, an agency working toward accreditation and a member of the NCASC reports a procedure is necessary to ensure the City of Mooresville’s community risk assessment is updated annually. The City of Mooresville is located twenty miles south of the City of Statesville and is comparable in size and population. They employ a procedure which dictates the who, what, why, and how of updating. Each year new hazards and threats are added to the document and then distributed to the stakeholders. Fire Marshall Gary Styers is in responsible for the risk assessment process. The Mooresville Fire Department currently uses the CFAI model (Styers, 2012).

The final research question was: Who should complete the community risk assessment? This question was answered from data sharing and interviews. City Manager Rob Hites feels the fire department should perform the risk assessment with collaboration from the GIS department and police department. Fire Chief David Bullins stated the accreditation team will conduct the risk assessment. This team is led by the accreditation manager who makes the assignments for the accreditation team. Though the accreditation team is comprised of suppression personnel, the fire and life safety division should be involved. The division is the first to review new business plans, issue bulk hazardous materials permits, and facilitate the design of new developments. Additionally, the fire and life safety division conducts all the fire inspections which ensure regular visits to all buildings within the city limits.

The NCASC SharePoint site illustrated different approaches to conducting community risk assessments. Of the fourteen departments reporting, only two agencies were large enough to justify full-time staff assigned to accreditation. These two agencies used their full-time
accreditation staff to execute their community risk assessment. The remaining agencies utilized existing staff who have responsibilities other than accreditation. Most had accreditation managers, or teams responsible for the entire accreditation process which includes community risk assessment (NCASC SharePoint, 2012). Considering these facts, it seems the Statesville Fire Department should continue to conduct the risk assessment for the City of Statesville. In addition, the accreditation manager should continue leading the process using suppression staff and fire and life safety division to assist.

Using the research discovered, a procedure was developed for updating the City of Statesville risk assessment. The procedure was designed using SFD standard format. Once completed, the procedure was presented to Fire Chief David Bullins for approval. As with all additions to procedures and policies, the new procedure was discussed and approved by the command staff on August 6th at the monthly command staff meeting (SFD, 2012). A copy of the policy can be found in Appendix D.

In summary, the results highlighted the national standards for community risk assessment models and proved the City of Statesville’s model meets the current standards. This was proven through document review and comparison with national standards, interviews, and a review of other North Carolina agencies. The third question proved the current process was on track however a few improvements could be made. Using a review of other risk assessments, improvements such as a notification system and the development of an updating procedure were revealed. The final question asked who should complete the risk assessment. First, City Manager Rob Hites states the fire department will continue to conduct the risk assessment for the entire city. Next, who within the organization should conduct the assessment? In many organizations, this comes down to resources. In the Statesville Fire Department, accreditation is assigned to the
accreditation manager and the accreditation team. The suppression division and fire and life safety division will assist the accreditation team with completing the community risk assessment. Finally, using this information a procedure was developed for updating the City of Statesville Community Risk Assessment.

Discussion

The purpose of this applied research project was to establish there was no comprehensive method for updating the community risk assessment. In fact, the assessment has not been updated since the original document was created in 2009. It was determined action research should be used to answer four research questions which would ultimately guide the information included in the procedure. To complete this task, a thorough literature review was completed, interviews of city administrators were conducted, a review of the current document was completed, and information was collected from other modern North Carolina all-hazard emergency services agencies.

Haddow, Bullock, and Coppola (2008) explain the foundation for an effective and accurate risk assessment begins with current and accurate data. Each step in the process requires quantitative or qualitative data. The data must be recorded and displayed in a format the entire agency can understand. Similarly, other research methods establish this to be correct. Both interviews revealed data is needed for risk assessment. City Manager Rob Hites sited the importance of the risk assessment data. He explained the City of Statesville is self-insured and this data gave the city a more reveling picture of the risk. Other assessments reviewed, using the NCASC SharePoint site, revealed all fourteen risk assessments provided data and used many different types of illustrations.

The literature review revealed three different risk assessment models. These models were developed by CFAI, USDHS, and IAFC which are each respected in the modern day emergency
services field. The research did not reveal disadvantages to the different models. In fact, the research of each model contained specific step-by-step method which makes the process achievable for most agencies. The NCASC revealed that many agencies are involved in the risk assessment process and NCASC exists for the purpose of assisting North Carolina emergency services agencies with accreditation, standards of cover, and risk assessments. I also found the models did not recommend a procedure or timeline for updating the risk assessment. However, each suggested the threats, hazards, and any new transportation networks should remain current (LeDuc, 2012).

Though disadvantages were not obvious, the CFAI risk assessment model did have one clear advantage. CFAI is the leading agency offering accreditation to emergency services organizations. If an agency decides to pursue accreditation, community risk assessment is a part of that process. The literature review explains CFAI requires accreditation seeking agencies to complete a document they call: “standards of cover”. Standards of Cover (SOC) is a rational and systematic method for assessing base services. Basically, the process of developing an SOC defines performance standards, measures service delivery, and applies benchmarks for performance standards (CFAI, 2008).

Community risk assessment is formally considered the second step in the SOC process but is also considered the most important (CFAI, 2009). As Chief Bullins (Appendix A) stated, the accreditation process is an important step to becoming an all hazards modern fire department. The Statesville Fire Department will continue striving toward accreditation. The NCASC currently has twenty-eight members but only fourteen of those members are accredited. This means an additional fourteen are working toward that goal. It is not the intent of the author to suggest agencies must pursue accreditation to complete a thorough risk assessment but to submit
it is an important and required component of the process. It would seem those agencies considering accreditation, and conducting a risk assessment, would be better served to use the model offered by the accrediting organization.

This applied research project highlights community risk assessments are imperative for several reasons. First, risk assessment models must be methodical and systematic so organizations of all sizes can complete them. CFAI provides a model that fits with the accreditation process and meets the goals of a thorough risk assessment. Second, the City of Statesville has conducted a risk assessment that meets the current standards but it has not been updated in several years. Third, as with any process improvements should always be strived for. Finally, Fire Chief David Bullins appointed an accreditation manager who is responsible for leading the accreditation process. As part of that process, the accreditation manager will also ensure the risk assessment is updated.

Organizational implications for this project are simple. The SFD focuses on being a modern all-hazards fire department. In order to continue that focus, developing and maintaining a comprehensive community risk assessment is essential. The current community risk assessment, illustrates the City of Statesville appears to have a myriad of risks ranging from single family residential structures to industrial structures. To deal with the many hazards, current and historical data must be collected, analyzed, and used to dictate current and future response. This project found research relevant to the community risk assessment process. The research was then used to develop a procedure for updating City of Statesville’s community risk assessment.

In summary, the level of service provided by an agency should be based on the department’s ability to cope with the type and size of emergencies that are reasonably expected.
The risk assessment process should direct an agency to provide the physical and human resources for a community to reduce serious losses from occurring. Currently, the City of Statesville’s community risk assessment is performed by the fire department and meets the standards identified in the literature review and results section.

Recommendations

The completion of this applied research project has resulted in a written comprehensive community risk assessment updating procedure. As with each new procedure, it was presented to the SFD Fire Chief and reviewed by the command staff. The procedure is now ready for implementation. The accreditation manager will be charged with ensuring compliance with the procedure. Primarily, the accreditation manager will need to train his current accreditation team on the procedure but the entire department will review the policy with their Battalion Chief. The risk assessment document is the responsibility of the accreditation manager but the accreditation team, suppression personnel, and fire and life safety personnel assist with the process.

Due to timing, it is recommended this procedure take effect January 1st, 2013. This will allow 2012 data analysis to be complete. Also, the City of Statesville did experience exponential growth since the last census. CFAI recommends the use of census data for population growth, socioeconomic issues, demographics, and education levels. The process for updating this information should begin immediately.

A short-coming in the current assessment was indentified. The City of Statesville’s current risk assessment does not include an employee notification system. A system for notifying employees should be developed. Though it is usual for fire department personnel and law enforcement officials to be called back in for disaster and emergencies, we often neglect the need for remaining city employees. Planning department personnel may be needed for damage assessment while public works employees may be needed to clear and repair city streets.
incident does occur, the incident commander will need a method for notifying employees and ensuring they have means to report to work.

Future readers should begin their research by examining their own community risk assessment. Many departments still do not have risk assessments. If an assessment does not exist, evaluate the models explained in this project and investigate which model is best for the organization. Accreditation is not just a trend. The idea began in the mid-1980’s and became a reality in 1996. Currently, over 160 agencies are CFAI accredited and a projected twenty to forty agencies achieve accreditation annually (publicsafetyexcellence.org, 2012). Determine if the department should pursue CFAI accreditation. If so, using the CFAI community risk assessment model is a good option. The modern fire service is responsible for more than putting out fires. They are slowly becoming modern all-hazard response forces and community risk assessments provide fire departments the information needed to mitigate the complex hazards faced in an increasingly complex society.
References

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Appendix A

Interview with David Bullins, Fire Chief, Statesville Fire Department.

1. When did community risk assessment begin in the City of Statesville?

   I became the fire chief in December 2007. Up to that point, a risk assessment had never been conducted. Prior to being named Fire Chief in Statesville, NC, I was a Battalion Chief for the City of Greensboro, NC. I worked in training and later in the planning division. Greensboro is an ISO Class 1 fire department and accredited by CFAI. I learned a great deal about the process and also so the enormous benefit of that process. I led an affirmation team which was successful.

2. Who do you feel should complete the assessment?

   The initial assessment was completed by suppression personnel. Most of the firefighters working of the project were part of the beginning phases of the accreditation process. This included strategic planning, annual report, and the risk assessment. Due to the small size of our organization, the accreditation team will manage the community risk assessment. The accreditation manager position was created in 2009. He is responsible for making those assignments. The SFD Fire and Life Safety Division should have some part in the process and should likely update the risk assessment team when a new threat or hazard is indentified by their office.

3. What risk assessment model should be used in the City of Statesville?

   Obviously, I believe in the CFAI model. The model was successful in prior experience and position. Though there are many different models, CFAI is designed for the fire
service and they update the model regularly. However, I do feel other models should be evaluated and see if improvements can be made. The SFD is on track to obtain accreditation in early 2014 therefore as part of the process the CFAI model will have to be completed.

4. How often should the community risk assessment be updated?

Risk assessments are part of being an all hazards fire department. I feel the assessment should be updated annually using current hazards and threats. The entire document should undergo serious review every five in conjunction with reaffirmation. The annual updates should be simple. For example, this year we had a factory install a 5,000 gallon liquid oxygen tank. The tank was reported to suppression by SFD Fire and Life Safety Division. That is a situation that falls into the high risk category and should have been added to the community risk assessment. More specifically, I would want it added to the risk assessment before the five year reaccreditation. Currently, we are working from a community risk assessment that is three and half years old.

5. What, if any, role does other city departments play in the risk assessment process?

The GIS staff helps immensely with community risk and the entire accreditation process. Before the accreditation process began, the fire department did not have a relationship with the GIS staff. Of course, Statesville is a small city so the entire department only has two people. The Statesville Police Department’s resources were included. Meetings with their command staff revealed some weaknesses for them and helped us understand how they are staffed.

6. Are there other changes not discussed above that need to be considered?
A data base of all city businesses needs established specifically for risk. Currently, we have list for inspections and preplans. Eventually, the data base could be updated as new hazards arrive. Again, this is an area where we do not have funds to develop a data base or purchase software. We also need to incorporate the SFD plan with the Iredell County Response plan. Iredell County began developing what they call the Iredell County All Hazard Response Plan in 2010 using an outside agency. This plan includes resources from the City of Statesville but the risk assessments have not merged. It is in the plan to work more closely with the county.
Appendix B

Interview with Rob Hites, City Manager, City of Statesville

Background

I currently serve as the City Manager for City of Statesville and have worked as the city manager for 20 years. I have 30 years of local government experience serving in small communities throughout North Carolina.

1. When did community risk assessments begin in City of Statesville?

Chief Bullins completed the first one. Around 2002, we did consider contracting a company to complete one. However, the county was discussing the same thing and it took them a little longer to get all the parts in motion.

2. Who do you feel should complete the assessment?

The fire department has taken the lead in this area. Since Chief Bullins came in 2007, he began periodic reporting, community risk assessment, and strategic planning. He has the obvious experience to lead his staff and accomplish projects such as this.

3. What community risk assessment model should be used?

I do not know enough about the models or even the overall process to decide. The model used by the fire department staff works well for our city. Further, the City of Statesville is self-insured and many of the risk identified helped us develop a more realistic risk pool. I know some steps were taken like dividing the city into different zones. GIS was involved and the zones are now used to provide the most efficient service to specific area. Also, any process that gives city leaders a clear picture of the past, present, and future is helpful.
4. How often should the community risk assessment be updated?

I like the thought of updating annually however after reviewing the extensiveness of the document I realize that may not be feasible. The county has a plan to update every five years and I would like to get on the same track with them. We are experiencing population growth and economic growth which increases risk and changes the city dynamic.

5. What, if any, role does other city departments play in the risk assessment process?

The project was initiated by the fire department but COS staff works closely with each other. I know planning, GIS, and police department staff all work on community risk and these departments should continue.

6. Are there other changes not discussed above that need to be considered?

No, I understand updating has not occurred since the original document was created.

Keeping a current risk assessment is necessary for the reasons discussed above.
Appendix C

Information Request
National Fire Academy Executive Fire Officer Program

I am currently enrolled in the National Fire Academy Executive Fire Officer Program. As part of that process, I am working on an applied research project which I hope to use to improve the City of Statesville Risk Assessment.

Many of you have your standards of cover and risk assessment documents posted on the NCASC SharePoint site. First, I need permission to use those documents for my research. Simply, send me an email authorizing use. Second, if you have a completed risk assessment, please post it to the SharePoint site. Finally, if you have a formalized procedure/policy for updating your risk assessment please post. Specifically, how often do you update your assessment, who is responsible, and what model is used.

Thank you for your time and assistance,

Joshua Smith, Fire Captain
Statesville Fire Department
Statesville Fire Department
Administrative Procedure

2.12 – Community Risk Assessment Updating Procedure

DATE: August 6, 2012

Prepared By: Joshua Smith, Fire Captain

Approved By: David Bullins, Fire Chief

Scope

The Statesville Fire Department developed the first City of Statesville Community Risk Assessment beginning in 2008 and finished in early 2009. City administrators and other city departments depend on this document to prepare for hazards and natural disasters. The National Fire Academy defines community risk assessment: “the process of gathering and analyzing information about the community and its risk”. The Commission on Fire Accreditation International (CFAI) explains community risk assessments should include the community’s exposure to natural and man-made disasters as well as fire and non-fire risk. The current document should serve as the framework for this updating procedure.

1. Responsibility

1.1. The SFD CFAI Accreditation Manager will be responsible for updating the community risk assessment. The fire chief is responsible for appointing the accreditation manager. Lieutenant Danny Nicholson is the current manager and has agreed to serve until accreditation is achieved in 2014.

1.2. The accreditation team with assist the accreditation manager. The current team is six members from the suppression division comprising of different ranks and shift representation. Committee members are appointed by the Deputy Chief of Operations and approved by the accreditation manager.

1.3. All three divisions will assist where assigned by the Fire Chief or accreditation manager.

2. CFAI Community Risk Model
2.1. The community risk assessment shall be updated using the CFAI model. The model can be found in the 5th Edition CFAI: Standards of Cover Guide: pages 33-50. Though CFAI updates materials regularly, the City’s risk assessment will need to stay consistent with the guide being used by the SFD for accreditation purposes. Occasionally, CFAI updates while you are being accredited or reaccredited. They expect the agency to continue using the guides they began the process with. This will keep the risk assessment and other components of the assessment consistent.

3. **Annual Update**

3.1. Certain components of the risk assessment will be updated annually. The process should start by February 15th. February 15th is date the prior year’s data is available for review. A list of each component is offered below. Components beginning with stars will be the responsibility of the fire and life safety division. They should report the necessary information to the accreditation manager. The manager will ensure the plan is updated accordingly.

3.1.1. Addition to transportation networks including roads, rail lines, airports, and water ways.
3.1.3. Service demand data including call type, location of calls, and frequency of calls
3.1.4. *Conduct a review of fire demands zone (FDZ’s). Ensure new hazards have not created the need to move zones or add zones.

4. **Accreditation or Reaccreditation Update**

4.1. The remaining components will be updated before accreditation or the before reaccreditation. For example, the current timeline show the SFD achieving accreditation mid-year 2014. A complete review shall be conducted in 2013 or early 2014. If possible, include the most current year’s data. This review should include all procedures found on pages 33-50.

4.2. The needed mapping as indicated on page 41 will be performed by the GIS division. This was approved by the city manager on July 15, 2012.

5. **Additional Updates**

5.1. CFAI recommends adding census data when new census statistics are released.

5.2. City annexations will need to be added once city services are added. The planning department agreed to work with SFD Fire and Life Safety Division to report new annexation details to the accreditation team.

6. **Evaluation**

2.13 Administrative procedure 2.12 will be reviewed annually by A-Shift Battalion Chief. The A-Shift Battalion Chief is assigned all 200 series administrative procedures. As with all
reviews, A-Shift Battalion Chief should meet with the individual responsible for implementing the procedure.

2.14 Any changes should be discussed with the command staff and the accreditation team. Once needed changes have been formulated, the changes will be presented to the Fire Chief and the remaining members of the command staff.