

TRAINING FOR COMPANY LEVEL FIRE INSPECTORS

Training for Company Level Fire Inspectors

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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 the language, ideas, expressions or writings of another.

Signed: _____ *Timothy D. Heimer* _____

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Abstract

The problem is the Town of Algoma Fire Department (TOAFD) does not currently have a training program to educate company level fire inspectors which could increase the risk to loss of life and property. The purpose of this research is to identify elements to be included in a company level fire inspection training program. This applied research project utilized the descriptive research method to identify applicable standards, evaluate current knowledge and provide recommendations on industry best practices. Literature review, personal communications, and a questionnaire were utilized to answer the following three research questions. 1. What national, state and local statutes and industry best practices exist concerning fire inspector competencies in Wisconsin? 2. What knowledge base do company level fire inspectors have regarding NFPA 1, local codes and inspection, testing, maintenance (ITM) of fire alarm and suppression system components? 3. What elements should be included in a company level fire inspection training program? The literature review identified several documents referencing NFPA standards applicable to company level fire inspections. Document analysis identified content and job performance requirements. Personal communications confirmed that in addition to identifying standards the TOAFD must also develop criteria to identify appropriate occupancies to be included in a company level program. The development of a checklist and proficient reporting system were also identified as important aspects of program development. Based on research gathered recommendations formulated include identification of occupancies based on hazard class, identification of applicable standards based on hazards, development of training criteria content, and structure based on current knowledge and identified needs.

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Introduction

Fire codes are designed to make buildings safer for the people who use them. According to a special report to the National Fire Protection Association (NFPA) by the Fire Protection Research Foundation from 2002 – 2005 519,000 structure fires were reported to municipal fire departments. These incidents resulted in 3,140 civilian deaths and 8.7 billion dollars in property loss. Incidents of fire in inspected properties made up only 25% of incidents and less than 5% of deaths (2008). However the report also notes that simply performing a fire inspection is not sufficient. The inspection must be performed by a competent inspector to achieve the desired outcome of preventing and minimizing risk. The Town of Algoma Fire Department (TOAFD) has a responsibility outlined in Wisconsin Administrative Code to provide training to all individuals directly involved in conducting fire inspections. The TOAFD would like to institute a company level fire inspection program to aid in building familiarity and hazard identification.

The problem is the TOAFD does not currently have a training program to educate company level fire inspectors which could increase the risk to loss of life and property. The purpose of this applied research project (APR) is to identify elements to be included in a company level fire inspection training program to reduce the risk of fire through competent fire inspections. Identification of industry best practices as well as applicable federal, state and local regulations and recommendations concerning fire inspector competencies and job performance requirements will be the focus of this applied research project.

The descriptive research method will be utilized to answer the following three questions:

(a) What national, state and local statutes and industry best practices exist concerning fire inspector competencies in Wisconsin, (b) What knowledge base do company level fire inspectors

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have regarding NFPA 1, local codes and inspection, testing, maintenance (ITM) of fire alarm and suppression system components, (c) What elements should be included in a company level fire inspection training program.

Background Significance

The Town of Algoma Fire Department (TOAFD) currently serves a community of 6,889 residents in an area encompassing 11.2 square miles. The Town is located in east central Wisconsin bordered by the class one city of Oshkosh to the east and Lake Butte Des Morts to the west. The area of the state is known as the Fox River Valley, a metro area comprised of over 350,000 residents.

The town historically has been a rural area made up mostly of agricultural land. The past twenty years the town has seen significant growth with most of the former agricultural land being developed into residential subdivisions. Much of the remaining area is located along the State Highway 21 corridor and is under development for future business and manufacturing zones. The town also has some high risk occupancies including nursing homes, schools and large commercial structures.

The TOAFD began serving the area in 1939 through a joint partnership with surrounding communities. In 1950 the agreement was terminated and the TOAFD became a standalone fire department serving only the Town of Algoma. The department is municipal and governed by an appointed town administrator and elected town board.

The department is currently made up of thirty- three paid per call members. Three members make up the command and administrative staff. These positions are fire chief, first assistant chief and second assistant chief. The positions of safety officer and fire inspector are

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also within the organizational structure but due to limited personnel these positions are presently vacant. Responsibilities of the vacant positions are now distributed within the administrative staff. Members are arranged into five companies, each is led by a captain with the remaining members assigned as apparatus operators and fire fighters.

The TOAFD by-laws outline the minimum training qualifications needed to be accepted as a member of the department. Applicants may be accepted as probationary members without formal training but are not allowed to participate in incident response. Currently, the department requires applicants to complete and pass State of Wisconsin Fire Fighter Level 1 as well as National Incident Management System (NIMS) level 200 and 700. Additional certifications such as fire inspector I are encouraged but not required for membership.

The TOAFD operates two engines, one tanker and two utility vehicles out of one centrally located fire station. The department responds to a variety of incidents including fires, vehicle extrications, and water rescues. Hazardous materials and technical rescue services are provided by surrounding agencies. Emergency medical services are provided by the Town of Algoma First responders with paramedic level transport by the City of Oshkosh Fire Department.

The TOAFD provides a fire prevention program to elementary school aged children once a year in October, as well as providing fire safety literature and demonstrations at various community events. Responsibilities for fire prevention education are administered by the department secretary and assigned to personnel on an as available basis. Outlines have been developed to guide personnel and ensure educational programs are meeting strategic goals.

Until recently the TOAFD had a dedicated position responsible for fire inspections and new construction review as well as suppression and alarm testing. The position was at the rank of

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captain and held by a recently retired member. The captain in charge of fire inspection was also a career firefighter who through his full-time employment had gained the required training and experience to adequately fulfill the responsibilities of the position. The captain in charge of inspections was assisted by two department members at the rank of firefighter who have completed State of Wisconsin Fire Inspector I certification.

The TOAFD has undergone several significant personnel changes within the past several years. In addition to losing the captain in charge of inspections, the members who assisted with fire inspections now hold the rank of fire chief and captain. These positions have been given additional administrative tasks. These additional responsibilities have made it difficult for personnel to complete all fire inspections within a timely manner.

The TOAFD has posted the position of fire inspector and offered to compensate individuals for attending the required training. The position of fire inspector requires individuals to complete and attain Fire Inspector I certification. A few younger members aspiring to gain full-time employment as a firefighter have completed the class as part of the fire science program offered at the local technical college. However, these members have not gained experience in actually conducting a fire inspection or received any continuing education. Many of these members also have a relatively short tenure as they move on to career departments. Due to the time commitment of the class and limited offerings the department has not had any applicants to fill the position.

The department currently inspects 100 properties. The town has adopted NFPA 1 as their standard for fire inspections. Inspections are completed on a bi-annual schedule. Inspections are recorded manually on a triplicate form provided by the State of Wisconsin. If violations are

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noted they are documented on the form and a copy is left with the property occupant. Additional copies are placed in a departmental file. The department does not currently have a method for electronically storing inspection records or accompanying building diagrams and pre-plans.

Due to the nature of the volunteer service, many newer members are forced to operate in positions above their rank. Many of the positions are filled at the time of the call on an as available basis. Members holding the rank of firefighter may be asked to operate at the company officer level or as incident command depending on the available personnel. The TOAFD has routinely used members of lower rank to fill these positions. Training in incident command and tactics are offered to all members to provide the tools to effectively operate in any position that may be needed.

In identifying additional training needs many members recognized the need for newer members as well as existing members to become familiar with the community as well as special hazards that may exist. The town also has a combination of geographical areas with and without municipal fire hydrants, making building and area familiarity an essential part of the decision making process early on during an incident response.

The administrative staff noted this request and instituted a building walk through as part of the training program. However, due the need to hold trainings in the evenings for volunteer members to attend, many properties were closed or could not accommodate a large group of people walking through their business during non-business hours. Many members also have family or work commitments on training nights and schedule time with their captain to receive missed skill assessment or knowledge. This was not possible with a building walk through and many were poorly attended.

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In attempting to find alternative opportunities for members to gain familiarity and hazard identification within the community, a proposal was made to institute a company level fire inspection program. This program would enable members to schedule an inspection on their free time as well as limit the number of personnel walking through the business. Inspections would be limited in number to ensure members were not overburden. This proposal would also enable administrative staff to share responsibilities for fire inspections and ensure inspections were completed in a timely manner. Inspected properties would be rotated among members to ensure familiarization with hazards and geographic areas within the jurisdiction.

The TOAFD has a responsibility to provide the community and its members with effective risk reduction strategies. One of the tools used to accomplish this task is through timely and competent fire inspection. The State of Wisconsin, through administrative code, has provided the fire chief with the duty of determining and approving the required amount and type of training needed to be assigned the role of fire inspector. The TOAFD must identify industry standards and best practices regarding the responsibilities of fire inspectors. The department must also identify current knowledge held by members regarding fire inspections. The TOAFD must ensure training program content provides the awareness and skills to effectively reduce the risk and impact of fire and emergency incidents within the community.

This research relates with the first operational objective of the United States Fire Administration (USFA). To reduce risk at the local level through prevention and mitigation. It also relates to Firefighter Life Safety Initiative number fifteen. Advocacy must be strengthened for the enforcement of codes. The research also hopes to provide the TOAFD with the planning and evaluation phase of common elements of successful risk reduction as discussed in unit one of Executive Analysis of Community Risk Reduction. While the research will not immediately

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impact the evaluation phase, the planning component will provide the TOAFD with the necessary knowledge to effectively select appropriate content to include in an inspection training program. This knowledge will not only aid in primary prevention but also provide members with the tools to effectively practice tertiary prevention should an event occur. Hazard recognition and building familiarity ideally will enhance fire ground effectiveness and limit potential impact to the community.

Literature Review

A literature review was conducted to identify applicable local, state and federal regulations, recommendations, and best practices concerning fire inspection competencies. Literature review also analyzed aspects of inspection practices and training development. Information from governing entities as well as fire service professional associations and private sector experts was collected and examined.

In the article *Fire Prevention Bureau Staffing: A Critical Need*, Fire Marshal Brett Lacey identifies the greatest resource of any fire prevention bureau is people. Lacey goes on to state fire departments must recognize what prevention services the department is expected to provide and what skills or knowledge existing personnel possess to provide those services (Lacey, 2008).

In Wisconsin, the qualifications needed to perform the tasks of fire inspections can be found in Wisconsin Administrative Code. The Department of Safety and Professional Services provides chapter SPS 314 to specifically address fire prevention and code enforcement. The qualifications for fire inspector are defined in SPS 314.01 (13)11, which states “Fire inspector training, all fire department personnel directly involved in conducting fire inspections are authorized by the department and by the fire chief to conduct the inspections upon completion of

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training approved by the fire chief” (Department of Safety and Administrative Services, 2014). SPS 314 does not indicate or define what that training should contain or how competencies should be measured. The code does indicate NFPA 1 as the model fire code to be referenced within SPS 314.

The National Fire Protection Association (NFPA) is viewed as the United States leading advocate of fire prevention and an authoritative source on public safety. “NFPA develops, publishes, and disseminates more than 300 consensus codes and standards intended to minimize the possibility and effects of fire and other risks” (National Fire Protection Association, 2015). Ruben Dagstanyan of the solar power industry references NFPA as an industry leading organization that should be consulted to ensure safety (Dagstanyan, 2015). Many other industries also rely on industry standards to guide training. The petroleum industry utilizes the API 1169 Pipeline Inspector Certification program, which has been developed in cooperation with industry and trade experts in order to establish an industry-wide training program and credentials for pipeline inspection professionals (American Petroleum Institute , 2015).

NFPA 1 briefly discusses the qualifications needed to enforce the model fire code. In Chapter 1.7.2, the text establishes the authority having jurisdiction (AHJ) as the party responsible for setting the minimum standards for those involved in fire inspections and code enforcement. However, the code also has additional material located within the annex. The information contained references NFPA 1031 as a document to provide additional information on qualifications of code enforcement personnel (National Fire Protection Association, 2011).

The NFPA has created a standard relating to fire inspector competencies. NFPA 1031 *Standard for Professional Qualifications for Fire Inspector and Plan Examiner* covers many of

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the industry consensus minimum job performance requirements for those performing fire inspections. The Fire Chiefs Handbook mentions NFPA standards as a way to provide credibility and validity to the service being performed (Eversole & Barr, 2003). NFPA 1031 identifies two levels of fire inspector certification with differing levels of competencies and responsibilities. Crawford an industry professional addresses the acceptable responsibilities that should be placed upon a company level inspector in his article; *The Truth About Company-Level Inspections Firefighters Should Conduct Inspections, But Only Within Limits*. Crawford urges managers to limit company level inspectors to smaller buildings with limited hazards. This type of inspection is best suited for the company level and their training. Many high hazard or mixed use occupancies require an expert within the field to adequately ensure all codes are followed properly. This type of inspection should be done by an individual who has attained the proper level of education and experience at the fire inspector II level (Crawford, 2001).

For the above reasons, literature review will concentrate on the required job performance requirements for NFPA 1031 fire inspector I. Chapter three provides a definition for fire inspector I, stating this position is at the first level of progression and conducts basic fire inspections. NFPA 1031 first mentions qualifications in chapter 1.3.5 indicating any person assigned to the duties of inspector shall meet all the requirements of chapter four prior to being qualified. Chapter four outlines areas of competencies as well as requisite knowledge and skills needed to competently fulfill these requirements. These competencies will be addressed later through document analysis in the procedures and results sections.

The Mississippi Institutions of Higher Learning formed a task force to identify NFPA codes specific to the inspection testing and maintenance of fire protection systems. In addition to

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NFPA 1031, additional NFPA standards that may be referenced when conducting a fire inspection include the following (Washington, et al., 2010).

- NFPA 10 Portable Fire Extinguishers
- NFPA 12 Carbon Dioxide fire extinguishing systems
- NFPA 12A Halon 1031 Fire Extinguisher Systems
- NFPA 17 Dry Chemical Fire Extinguishing Systems
- NFPA 17A Wet Chemical Fire Extinguishing Systems
- NFPA 25 Water based fire protection systems
- NFPA 72 Fire alarm systems
- NFPA 750 Water-mist systems
- NFPA 2001 Clean agent extinguishing systems

Upon the completion of identifying applicable standards Usrey an implementation manager for safety programs identifies the process of plan-do-study-act (PDSA) when developing an inspection program. He identifies planning as the first step in program development. The planning stage should address the following five areas and a plan for completing each.

- Development of a tool or checklist
- Development of an inspection schedule
- Training for members of the inspection team(s)
- Responsibility for the abatement
- Tracking of identified hazards for timely correction

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Usrey goes on to say that by identifying inputs such as who will be doing the inspection, and how they will do it will aid in measurable and predictable outputs (Usrey, 2012).

Simmons of Home Guides also identifies the use of a checklist when performing home inspections. In his article he describes a checklist as a way to ensure inspectors are adequately covering all areas that they need to look at (Simmons, 2015).

Surgeon Dr. Atul Gawande discusses how checklists have made many difficult tasks from thoracic surgery to flying an airplane easier and safer. Gawande, also points out that checklists serve more than one purpose. He uses the example of a building inspector determining the wind force calculation for a high rise building. These types of problems involve more knowledge and complexity than one inspector could possibly have. While the inspector does as much as possible to oversee the buildings construction, the main responsibility is to ensure the builders have the proper checks in place and to have the builder document that those benchmarks were met. This use of checks disperses the power and responsibility among all parties involved (Gawande, 2009).

Division Chief Brian Bending of the Oshkosh Fire Department also mentioned the importance of checklists when performing a company level inspection. Chief Bending oversees six engine companies of three shifts all of which perform fire inspections. Chief Bending incorporated the checklist he developed that is used by company officers into the reporting software to minimize duplication of efforts when reporting violations. Chief Bending stated, there are several examples from other cities that can be found on-line depending on the demographics and occupancies within your community, some may work better than others.

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Whatever you choose, the checklist should be easy to use and applicable to the occupancies being inspected (B.Bending Personal Communication, May 01, 2015).

Frangiamore a certified fire protection specialist provides an excellent example of the content and arrangement of checklist. He lists general topics and associated areas that should be assessed for code violations. Frangiamore's checklist addresses the following areas.

- Access and Premise
- Means of egress
- Electrical
- Fire Extinguishers
- Fire Alarm System
- Fire Sprinkler-system
- Special suppression system (Kitchen hood)
- Heat Producing Appliances and Devices
- Storage and Maintenance of Building Area
- Smoke and Carbon monoxide Alarms

While this list may not be all encompassing, each general area has several sub-categories which may be applicable depending on occupancy (Frangiamore, 2009).

As mentioned earlier by Usrey (2012), the second step in the inspection process is to develop an inspection schedule. In Wisconsin the frequency of fire inspections are dictated by administrative code 314.01 (13)3 which specifies that inspections be completed at least once in each non-overlapping 6 month period per calendar year (Department of Safety and Administrative Services, 2014).

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When scheduling inspections, Crawford states company level inspections should be conducted with limits. Company level inspectors should be placed in an environment that fits their level of training and expertise (Crawford, 2001). Chief Brian Bending also stated part of his responsibilities in overseeing the company level inspection program is to develop criteria to determine appropriate buildings and occupancies to be included in company level inspections (B.Bending Personal Communication May 15 2015).

The City of Portland Oregon has formally adopted this practice and drafted administrative rule outlining the procedure for selecting what level of expertise is needed for each type of building or occupancy. The administrative rule outlines the following steps for determining the appropriateness of inspector certification level (City of Portland, Oregon, 2007).

Assignment of Occupancies

1. It is intended that the station's inspection area will conform with their Fire Management Area to the extent that it is possible.
2. The selection of the occupancies to be inspected will be a cooperative effort between the Company Fire Inspector Program (CFIP), the District Inspector, and the Station Captain.
3. The inspections selected for CFIP should be of a low hazard nature. When a company fire inspector happens upon an occupancy that is beyond their scope of expertise: do not finish the inspection; let the business owner know that the inspection will be reassigned to a District Inspector; then contact the CFIP Inspector with your findings.

The SHELL model proposed by Hawkins has played a critical role in developing training policy since the 1980's. SHELL is an acronym which represents software, hardware,

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environment, liveware and liveware. The second liveware represents the human interaction with associated parts (Perezgonzalez & Fryer, 2010). This model recognizes the need for a training program to not only provide the student with the desired course content but also to educate the student on how to use that content to achieve the desired effect.

The Fire Protection Research Foundation (2008) in table 14 of their report *Possible Elements for an approach to Strengthen and Systemize the Educational and Motivational Aspects of Inspections*, discusses educational motives associated with inspections. Simply having the knowledge to identify a violation is not enough if the inspector is not trained to educate the occupant and provide motivation to change the behavior.

In the article *Demonstrating Your Fire Prevention Program's Worth*, King discusses the why? He explains the why is indicating the importance of your program. To demonstrate effectiveness your program must have an evaluative phase. King explains evaluation of fire prevention programs have been incorporated to the accreditation process through the Center for Public Safety Excellence as well as the Insurance Services Office. By providing an evaluative measure we can provide valuable feedback to the community and our personnel (King, 2011).

One of the most effective ways to provide effectiveness is through detailed documentation. *Fire Inspector Principals and Practices* stress the importance of good field notes. The correct documentation of fire inspections should be incorporated into a fire inspection training program to guarantee uniformity and eliminate barriers to communication (International Association of Fire Chiefs, 2012).

The literature review identified several state and national standards that are recommended competencies for entry level fire inspectors. Fire service professional associations as well as

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industry professionals specializing in the administration of company level inspections provided job performance requirements. Standards also provided benchmarks for advancing levels of fire inspection certification and associated responsibilities.

Literature review also evaluated recommendations concerning the process of inspecting. Industry professionals and subject matter specialist provided information regarding inspection best practices and procedures. The use of a checklist was identified by several professionals as a useful tool to accomplish competent and complete inspections. Literature review provided several sources for referencing checklist content.

In addition to identifying applicable standards and job performance requirements, the literature review provided valuable information related to the process of implementing a company level inspection program. Administrators must know the affected personnel and their level of knowledge. That level of knowledge then can be enhanced through the training program and the use of a checklist. Using this information appropriate buildings should be identified to include in company level inspections. Procedures should be developed to ensure the hazard of the occupancy or technical knowledge needed does not exceed the fire inspector's level of competency.

Training should also include how to communicate the dangers of fire code violations and documentation procedures. Through the proper documentation program, administrators as well as company level inspectors will be provided with evaluative measures to improve and show value of inspections and their impact on safety in the community.

Information provided by literature review along with additional findings contained in the procedures and results sections should assist the author in determining recommendations for

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developing content to be included in a company level inspection training program for the Town of Algoma Fire Department.

Procedures

The purpose of this applied research paper was to identify elements that should be included in a company level fire inspection training program. The Town of Algoma Fire Department has a duty to reduce the risk of fire and associated hazards through competent fire inspections.

Applied research was accomplished using the descriptive research method. Information gathered focused on answering three research questions. The first question, what national, state and local statues and industry best practices exist concerning fire inspector competencies in Wisconsin? The second, what knowledge base do company level fire inspectors have regarding NFPA 1, local codes, and inspection, testing, maintenance (ITM) of fire alarm and suppression system components? Third, what elements should be included in a company level fire inspection training program?

Literature review was initially conducted while participating in the Executive Fire Officer Program at the National Fire Academy located in Emmitsburg, Maryland. Reference material available through Learning Resource Center located on the Academy campus provided valuable information. Literature review continued upon returning. Reference material was obtained through the Oshkosh Public Library as well as utilization of internet search engines and industry related web sites. Publications from professional associations and state statues were obtained through TOAFD and City of Oshkosh training materials. Literature review provided the primary source of information for research question number one.

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To identify national, state, and local statute applicable to fire inspector competencies in the State of Wisconsin and provide information for research question number one, a document analysis was performed identifying job performance requirements needed per State of Wisconsin administrative rule. Wisconsin determines qualifications and training for fire inspector as those approved by the fire chief in the jurisdiction which the inspector serves.

Limitations to this analysis are in the broad interpretation and vague nature of the language. The state does not define the type of training that is needed or provide any evaluative measures to ensure competency. As stated in literature review NFPA 1 is referenced as the code standard for the state of Wisconsin. NFPA 1 references 1031 as the standard relating to fire inspector job performance requirements. NFPA 1031 in chapter four provides job performance requirements for fire inspector 1. (Appendix A) For this reason document analysis was limited to NFPA 1031.

These areas were then analyzed and referenced with the applicable duties to be assigned to a company level inspector. Responsibilities assigned to the TOAFD fire inspection program are limited to code violation identification and documentation through field inspections. Duties outside these parameters are responsibilities delegated to local and state agencies with the results made available to local officials.

Training records from the past five years were also analyzed to determine if any applicable training had been presented to members. Records did not provide any instances of fire inspection training or any components that may have been related.

To provide answers to question number two a questionnaire was distributed to measure the current knowledge regarding fire code among company level personnel. This data provided

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the TOAFD with a baseline in which to develop training program curriculum and determine the types of occupancies and hazards to include in the initial company level inspection program. Questionnaires were made available to all department members with the exception of three individuals who are currently conducting fire inspections. A total of fourteen members participated. Members were asked to identify fire code violations per NFPA 1 fire code specifications. A sample questionnaire can be found in appendix B.

The questionnaire consisted of thirty questions. Fourteen questions were close ended and sixteen asked respondents to fill in an answer. The fourteen close ended questions were quantitative in nature and designed to measure the ability of members to identify code violations. The sixteen additional questions were quantitative as well as qualitative in nature. These questions were designed to not only measure the ability of personnel to identify code violations but also to what depth individuals were familiar with the full code requirements. Question one was open ended and referenced local ordinance. Questions two through five addressed fire codes related to electrical issues. Questions six through nine related to fire extinguishers and correct placement. Questions ten through seventeen addressed exit markings, emergency lighting and exit discharges. Questions seventeen through twenty-two related to general precautions against fire. Questions twenty-two through thirty addressed NFPA 25 and 72 specifications and testing frequencies. A detailed breakdown of responses is located in appendix C.

Limitations to the questionnaire were in the broad nature of the subject matter. The questionnaire sought to focus on the topics most relevant to company level inspectors. It also focused on hazards most relevant to those that may be found in Town of Algoma inspected properties. While the questionnaire alone will not provide adequate evidence of proficiency and

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knowledge it will give a strong indication of content areas to include in training program development.

Research for question number three focused on literature review as well as personal communications. An interview was held with Battalion Chief Brian Bending of the Oshkosh Fire Department. (OFD) The west side of Oshkosh borders the Town of Algoma and is very similar in its construction and occupancies. Chief Bending oversees company level inspections in this area and was able to provide valuable knowledge gained through experience. Additionally literature review focused on inspection practices developed by subject matter specialists. This information provided industry best practices regarding inspection procedures. Areas specific to communication, documentation and training program development were researched.

Limitations to this research were in the relatively small number of subject matter specialist within private industry and the fire service specific to a volunteer department or organization. Several full-time departments within the area conduct company level fire inspections. Oshkosh was chosen because of its proximity and similar demographics. There are several volunteer departments within the immediate vicinity. All have dedicated members conducting fire inspections and have not included company level personnel on inspections. Research attempted to identify content that took into account the limited training time and available resources that can be found within many volunteer organizations.

Results

The purpose of this applied research project is to identify elements to be included in a company level training program to reduce the risk of fire through competent fire inspections.

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This project also identified the current level of knowledge regarding fire codes to provide a basis for recommendations regarding content to include in a company level fire inspection program.

Research conducted through literature review identified governing bodies responsible for providing the qualifications for fire inspectors. Literature review revealed the referencing of state statute and professional organizations as holding NFPA 1031 as the standard by which qualifications are identified. NFPA 1031 provided a detailed table of job performance requirements assigned to the designation of fire inspector I. These areas of skills and knowledge assisted in answering research question number one. (a) What National, State and local statutes and industry best practices exist concerning fire inspector competencies in Wisconsin?

Chapter four outlines the job performance requirements. Chapter four specifies that these requirements are defined within section 4.2 through 4.4 in addition to section 4.2 of NFPA 472

The first area of competency section 4.2 discusses is administrative tasks. Section 4.2.1 involves the keeping of detailed reports and records. This area is applicable to the company level inspector and content involving proper documentation should be provided. The second area 4.2.2 discusses the issuance of permits. This area is not applicable to the company level inspector. The permit process is currently delegated to the building inspector and fire chief. Section 4.2.5 discusses identifying applicable code language to reference a given violation. This knowledge is applicable and content should introduce members to NFPA 1 text and familiarize them with reference material. Section 4.2.6 covers legal issues. While training content in this area may not be in depth, members should be made aware of the process should a legal issue arise.

Section 4.3 discusses field inspections and associated requirements. This section includes inspections for construction occupancy, fire protection and exposures. This section has limited

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applicability as new structures and structures involved in construction will not be included in a company level program. Field inspection training content will be limited to existing buildings that are on a regularly scheduled bi-annual basis. 4.3.1 Requires personnel to determine occupancy classification. This content should be included as fire code requirements vary widely based on occupancy classification. Section 4.3.2 covers computation of occupancy loads. This content will not be included as this responsibility is delegated to the building department within the jurisdiction. 4.3.3 Discusses means of egress. This area will provide a large portion of training content as it is very applicable to company level inspections. Section 4.3.4 presents identification of construction types for an addition or remodeling project. This has limited applicability as this responsibility is also delegated to the building inspector and fire chief. Section 4.3.5 and 4.3.6 covers the operation of fire suppression and alarm systems. This responsibility is applicable to the company level inspector and content including NFPA 25 and NFPA 72 are identified for training program development. Section 4.3.7 covers fire extinguishers. Training content covering the placement, proper size and type as well as maintenance should be included. 4.3.8 Recognizes general hazards and precautions against fire. This area is applicable and content should be developed to provide the requisite knowledge. 4.3.9 Discusses fire protection system plans and is not applicable to the company level inspector as these duties are delegated to the State of Wisconsin. 4.3.10 identifies the need for emergency plans and exercises. This area has limited content as field inspectors will need to verify records of compliance for fire and emergency drills, as well as the posting of evacuation plans. However, the designs of these plans are the responsibility of the building official, fire chief and occupant. Section 4.3.11 covers emergency access to the site. This area is applicable and content should be developed to address access. Additional content should be developed to include the maintenance

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of snow removal to ensure access. Sections 4.3.12 and 4.3.13 identify codes applicable to the storage and handling of flammable and combustible liquids as well as hazardous materials.

Training content in this area will be limited to identification and documentation. Training will identify unsafe practices and applicable codes. Determination of allowable quantities will be forwarded to the fire chief for code enforcement. 4.3.14 considers the recognition of potential hazardous fire growth within a building or space. This area is applicable to the company level inspector and members should be trained in codes designed to limit the impact and spread of fire, should it occur. Building features, such as closed fire doors and intact walls and ceilings, can be recognized for training program content. 4.3.15 identifies the determination of code compliance with applicable codes, standards and policies. This area is applicable to ensure follow up re-inspections are conducted in an efficient manner. 4.3.16 covers calculation of fire flow. This area is not applicable to company level inspectors. The final section of chapter four, 4.4 plans review determines that there are no requirements for the inspector I level concerning this area.

To identify the current understanding and needs of TOAFD company level inspectors a questionnaire was developed to answer research question number two. (b) What knowledge base do company level fire inspectors have regarding NFPA 1, local codes and inspection, testing, maintenance (ITM) of fire alarm and suppression components? Data from this questionnaire was analyzed to provide a baseline to which develop training program content.

Data indicated that the lowest scoring area of knowledge was regarding local ordinance. Question one asked to list the elements of the Town of Algoma outdoor burning ordinance. This question was open ended and contained five parts. One respondent was able to correctly identify all five parts. Six of the respondents were only able to identify one component.

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The second lowest scoring area was questions twenty-nine and thirty concerning fire suppression systems. Questions were designed to measure the knowledge of testing and maintenance schedules for sprinkler and fire pump systems. Of the participants 10.5% were able to correctly identify required maintenance schedules.

Sections concerning electrical codes, fire extinguishers, fire alarm systems and general precautions against fire showed a moderate level of knowledge scoring between 54% and 63%. Questions two, six, twenty and twenty-two showed the greatest need for training curriculum. Question six asked to identify the requirement of monthly visual checks and documentation for fire extinguishers with 35% identifying the correct answer. Question's twenty and twenty-two tested member's knowledge on storage of heat sources and flammable liquids with 42% answering each correctly.

Knowledge base on exits and exit pathways scored the highest with 75.4% of members selecting the correct answer or identifying the applicable code violation. A sub section of this area, questions fifteen and sixteen showed the need for additional training in the full understanding of requirements. Question fifteen asked if emergency lighting needs to be tested and if so how often. Responses showed that 71% were able to identify that lighting needed to be tested but only 14% were able to correctly identify the frequency. Question sixteen asked if fire drills are required to be recorded for elementary schools and if so how often. Responses indicated that 100% of members were aware that fire drills were required but only 14% were able to correctly identify the frequency.

Results from document analysis identified through research question number one, as well as literature review provided answers for research question number three. (c) What elements

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should be included in a company level fire inspection training program? Document analysis determined applicable job performance requirements applicable to fulfilling SPS 314 requirements. Literature review identified areas outside of code identification which should be included to enhance the effectiveness of a fire inspection program. Areas concerning proper documentation and communication skills will aid the inspector in providing building owners with effective risk reduction strategies. The development and training on the use of a checklist to enhance knowledge and ensure completeness will also aid in providing competent inspections. An analysis of occupancies and associated hazards should be performed to ensure inspections assigned to company level personnel are not exceeding their level of expertise.

Results from research question one and research question two will also aid in curriculum development by analyzing what members need to know verse what they already know. Appropriate elements and the amount of time dedicated to each element can be determined and a curriculum developed.

Discussion

The literature review provided support that there is a need to provide training for members expected to perform company level fire inspections. This requirement is set forth in SPS 314 of Wisconsin Administrative Code (2014). This code outlines training as to be approved by the fire chief but does not specify what type or how to evaluate competencies. Wisconsin has adopted NFPA 1 as the document specifying fire code requirements. NFPA 1 (2015) references NFPA 1031 as the guiding standard for identifying fire inspector competencies. NFPA 1031 (2011) specifies job performance requirements. These competences provide an evaluative tool to

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authenticate fire inspector knowledge and skills. Eversole and Bar (2003) agree and reference NFPA standards as a way to provide credibility and validity.

Dagstanyan (2015) reiterates that calling NFPA an industry leading organization. The American Petroleum Institute (2015) also utilizes the use of industry professionals to develop and identify training competencies and credentials. Literature review also identified several additional NFPA standards applicable to the duties of company level inspectors Washington, et al. (2010). Through their research documented several additional NFPA standards relevant to the fire suppression and alarm systems inspections conducted at Mississippi's college institutions. Standards most applicable to the company level inspector include NFPA 10 fire extinguishers, NFPA 25 water based fire protection systems and NFPA 72 fire alarm systems. Questionnaire results also showed the need to include NFPA standards as many members were unfamiliar with inspection, testing, and maintenance frequencies. Washington goes on to mention several additional NFPA standards; however, they have limited applicability to the company level inspector.

Crawford (2001) touches on the subject of the limits of company level inspectors. He advocates for leaders to limit the type of inspections company level inspectors perform to smaller low hazard buildings. Crawford argues that these types of inspections are better suited for the level of knowledge and expertise of the company level inspector. High hazard buildings require the skill and knowledge base of a higher level inspector to ensure codes are followed adequately. Battalion Chief Bending (2015) also mentioned understanding the occupancies and demographics within your community as a useful tool when assigning company level inspections.

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The TOAFD has not formally created a procedure for classifying hazard classes or occupancies. Criteria must be developed to provide company level inspectors suitable occupancies for their level of skill. Based on building occupancy and hazard level known standards can then be referenced. Standards found to be applicable to the inspected properties then can be included in training program content. The City of Portland (2007) has adapted this practice and created a policy outlining the duties company level inspectors are expected to perform. The Portland model allows for company level inspectors to assign the inspection to a higher level should they find occupancy beyond their level of expertise. Adoption of a similar model would provide useful to the TOAFD as the initial classification of occupancies may need to be evaluated over time as company inspections are instituted. This process would ensure occupancies are matched with the correct level of expertise.

To aid in providing competent inspections Ursrey (2012) and Frangiamore (2009) recommend the development of a checklist. Simmons (2015) also agrees and adds a checklist will ensure all areas of inspections are adequately covered. Dr Gawande (2009) adds to the argument for using checklists. He states the use of a checklist makes a complex task much easier and safer. The use of checklists is commonplace within the fire service, from ensuring correct equipment is placed on an apparatus, to carrying out command functions. Chief Bending (2015) states these checklists must be tailored to your specific department. The TOAFD must analyze data to select appropriate occupancies. Applicable fire codes concerning these occupancies should then be identified. Through the interpretation of the data provided by the questionnaire, a checklist then can be developed to aid in providing the required knowledge needed. Results from the questionnaire indicated that three areas for consideration would be local ordinance,

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emergency lighting, and the inspection, testing, and maintenance frequencies for sprinkler systems.

Usrey (2012) identifies this process, by identifying the inputs; occupancy, code, and knowledge, a predictable and measurable outcome will be recognized. Dr Gawande (2009) touches on this by using the example of a building inspector facing a complex issue. A checklist supplements inspector's knowledge and reduces complexity. A checklist aids in confirming the inputs or benchmarks are being met to provide the desired outcome. By providing a checklist, the inspector ensures the suppression or alarm service company is meeting benchmarks and shares the responsibility of making sure the system is in proper working order. As indicated above a need for additional training is shown to ensure adequate understanding of local ordinance and sprinkler system test requirements. The TOAFD must design a checklist that supplements knowledge. Many members were aware that sprinkler systems, as well as emergency lighting needed to be tested. The gap in knowledge existed in the recall of testing frequency. The TOAFD checklist should include system testing frequencies, as well as elements of local ordinance to aid inspectors.

The Fire Protection Research Foundation (2008) provided valuable insight into training content outside of code recognition and inspection procedures. Training material must also include strategies to educate occupants and provide the desired behavior change. King (2011) explains that inspection programs must include an evaluative phase to prove effectiveness. The International Association of Fire Chiefs (2012) cites detailed documentation as a way to provide evidence of effectiveness. The TOAFD must look beyond simple code enforcement and provide members with the tools to effectively engage the public. Perezgonzalez and Frier (2011) discuss this interaction and advocate for training program content to include communication strategies.

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The current documentation system used by the TOAFD is cumbersome and outdated. Accessing archival information is difficult to evaluate if past violations or behaviors have been modified to provide evaluation of effectiveness. The TOAFD must develop documentation strategies and procedures to enhance ease of use and accessibility. Training should provide the user with the tools to accurately document violations and clearly communicate the importance of corrective measures to the occupant.

Lacey (2008) identifies the most important resource in any fire prevention bureau is people. Ursays (2012) plan-do-study-act process will ensure that the TOAFD is providing its members with the resources to perform competent inspections. Results obtained will result in a dynamic process as each area of training curriculum is evaluated. Selection of occupancies will dictate applicable job performance requirements. Results from the questionnaire will dictate areas of concentration for training content. Documentation will provide an evaluative measure to ensure selected occupancies are appropriate for the level of training provided. Action must then be taken to re-evaluate the appropriateness of a given occupancy or provide additional training content.

In implementing these steps and applying relevant standards and inspection practices, appropriate training content can be identified. This content will aid the TOAFD with development of a company level training program and provide effective risk reduction strategies for the community.

Recommendations

The following recommendations were drawn from the research gathered. The purpose of this applied research project was to identify elements to be included in a company level fire

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inspection program to reduce the risk of fire through competent inspections. Research identified areas of competencies, as well as processes to formulate appropriate training content based on hazard classification and assigned duties.

The Town of Algoma Fire Department hopes to implement these recommendations to begin development of a company level training program. The goal of this training program is to meet the intent of Wisconsin Administrative Code SPS 314.01 (13) 11 and provide the residents and employees of the Town of Algoma with a safer environment and working conditions.

- Form a committee of administrative staff and department members to create a strategic plan for company level fire inspection implementation.
- Update department job descriptions to include the duties and responsibilities assigned to company level fire inspectors.
- Develop a matrix to assign hazard classifications to inspected occupancies.
- Identify occupancies with fire suppression systems and fire alarm systems.
- Evaluate and select occupancies appropriate for company level inspections based on hazard classification and complexity of suppression and alarm systems.
- Identify and evaluate fire inspector I job performance requirements and applicable NFPA standards based on occupancy and TOAFD company level fire inspector duties.
- Conduct a needs assessment based on identified job performance requirements and company level members existing knowledge base concerning fire inspections.
- Based on applied research develop training program content.

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- Implement a job shadowing program to allow members to walk along on fall 2015 inspections to gain experience.
- Develop an electronic reporting system.
- Identify content to be included on a fire inspection checklist.
- Bring in local business owners and allow members to hold a mock inspection conference to enhance documentation and communication skills.
- Develop a SOP/SOG similar to the Portland model to address company level inspections.
- Place a priority on filling the fire inspector position.
- Designate a member to oversee the company level inspection program.
- Develop a schedule for implementation and evaluation.

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APPENDIX A

NFPA 1031 Job Performance Requirements

4.1 General.

The Fire Inspector I shall meet the job performance requirements defined in Sections 4.2 through 4.4. In addition, the Fire Inspector I shall meet the requirements of Section 4.2 of NFPA 472.

4.2 Administration.

This duty involves the preparation of correspondence and inspection reports, handling of complaints, and maintenance of records, as well as participation in legal proceedings and maintenance of an open dialogue with the plan examiner and emergency response personnel, according to the following job performance requirements.

4.2.1 Prepare inspection reports, given agency policy and procedures, and observations from an assigned field inspection, so that the report is clear and concise and reflects the findings of the inspection in accordance with the applicable codes and standards and the policies of the jurisdiction.

(A) Requisite Knowledge. Applicable codes and standards adopted by the jurisdiction and policies of the jurisdiction. (B) Requisite Skills. The ability to conduct a field inspection, apply codes and standards, and communicate orally and in writing.

4.2.2 Recognize the need for a permit, given a situation or condition, so that requirements for permits are communicated in accordance with the applicable codes and standards and the policies of the jurisdiction.

(A) Requisite Knowledge. Permit policies of the jurisdiction and the rationale for the permit. (B) Requisite Skills. The ability to communicate orally and in writing. 4.2.3 Recognize the need for plan review, given a situation or condition, so that requirements for plan reviews are communicated in accordance with the applicable codes and standards and the policies of the jurisdiction.

(A) Requisite Knowledge. Plan review policies of the jurisdiction and the rationale for the plan review. (B) Requisite Skills. The ability to communicate orally and in writing. 4.2.4 Investigate common complaints, given a reported situation or condition, so that complaint information is recorded, the AHJ-approved process is initiated, and the complaint is resolved.

(A) Requisite Knowledge. Applicable codes and standards adopted by the jurisdiction and policies of the jurisdiction. (B) Requisite Skills. The ability to apply codes and standards, communicate orally and in writing, recognize problems, and resolve complaints.

4.2.5 Identify the applicable code or standard, given a fire protection, fire prevention, or life safety issue, so that the applicable document, edition, and section are referenced.

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(A) Requisite Knowledge. Applicable codes and standards adopted by the jurisdiction. (B) Requisite Skills. The ability to apply codes and standards.

4.2.6 Participate in legal proceedings, given the findings of a field inspection or a complaint and consultation with legal counsel, so that all information is presented and the inspector's demeanor is professional.

(A) Requisite Knowledge. The legal requirements pertaining to evidence rules in the legal system and types of legal proceedings.

(B) Requisite Skills. The ability to maintain a professional courtroom demeanor, communicate, listen, and differentiate facts from opinions.

4.3 Field Inspection.

This duty involves fire safety inspections of new and existing structures and properties for construction, occupancy, fire protection, and exposures, according to the following job performance requirements.

4.3.1 Identify the occupancy classification of a single-use occupancy, given a description of the occupancy and its use, so that the classification is made according to the applicable codes and standards.

(A) Requisite Knowledge. Occupancy classification types; applicable codes, regulations, and standards adopted by the jurisdiction; operational features; and fire hazards presented by various occupancies.

(B) Requisite Skills. The ability to make observations and correct decisions.

4.3.2 Compute the allowable occupant load of a single-use occupancy or portion thereof, given a detailed description of the occupancy, so that the calculated allowable occupant load is established in accordance with applicable codes and standards.

(A) Requisite Knowledge. Occupancy classification; applicable codes, regulations, and standards adopted by the jurisdiction; operational features; fire hazards presented by various occupancies; and occupant load factors.

(B) Requisite Skills. The ability to calculate occupant loads, identify occupancy factors related to various occupancy classifications, use measuring tools, and make field sketches.

4.3.3 Inspect means of egress elements, given observations made during a field inspection of an existing building, so that means of egress elements are maintained in compliance with applicable codes and standards and deficiencies are identified, documented, and reported in accordance with the applicable codes and standards and the policies of the jurisdiction.

(A) Requisite Knowledge. Applicable codes and standards adopted by the jurisdiction related to means of egress elements, maintenance requirements of egress elements, types of construction, occupancy egress requirements, and the relationship of fixed fire protection systems to egress requirements and to approved means of egress elements, including, but not limited to, doors, hardware, and lights.

(B) Requisite Skills. The ability to observe and recognize problems, calculate, make basic decisions related to means of egress, use measuring tools, and make field sketches.

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4.3.4 Verify the type of construction for an addition or remodeling project, given field observations or a description of the project and the materials being used, so that the construction type is identified and recorded in accordance with the applicable codes and standards and the policies of the jurisdiction.

(A) Requisite Knowledge. Applicable codes and standards adopted by the jurisdiction, types of construction, rated construction components, and accepted building construction methods and materials.

(B) Requisite Skills. The ability to read plans, make decisions, and apply codes and standards.

4.3.5 Determine the operational readiness of existing fixed fire suppression systems, given test documentation and field observations, so that the systems are in an operational state, maintenance is documented, and deficiencies are identified, documented, and reported in accordance with the applicable codes and standards and the policies of the jurisdiction.

(A) Requisite Knowledge. A basic understanding of the components and operation of fixed fire suppression systems and applicable codes and standards.

(B) Requisite Skills. The ability to observe, make decisions, recognize problems, and read reports.

4.3.6 Determine the operational readiness of existing fire detection and alarm systems, given test documentation and field observations, so that the systems are in an operational state, maintenance is documented, and deficiencies are identified, documented, and reported in accordance with the policies of the jurisdiction.

(A) Requisite Knowledge. A basic understanding of the components and operation of fire detection and alarm systems and devices and applicable codes and standards.

(B) Requisite Skills. The ability to observe, make decisions, recognize problems, and read reports.

4.3.7 Determine the operational readiness of existing portable fire extinguishers, given field observations and test documentation, so that the equipment is in an operational state, maintenance is documented, and deficiencies are identified, documented, and reported in accordance with the policies of the jurisdiction.

(A) Requisite Knowledge. A basic understanding of portable fire extinguishers, including their components and placement, and applicable codes and standard

(B) Requisite Skills. The ability to observe, make decisions, recognize problems, and read reports.

4.3.8 Recognize hazardous conditions involving equipment, processes, and operations, given field observations, so that the equipment, processes, or operations are conducted and maintained in accordance with applicable codes and standards and deficiencies are identified, documented, and reported in accordance with the applicable codes and standards and the policies of the jurisdiction.

(A) Requisite Knowledge. Practices and techniques of code compliance inspections, fire behavior, fire prevention practices, ignition sources, safe housekeeping practices, and classification of hazardous materials.

(B) Requisite Skills. The ability to observe, communicate, apply codes and standards, recognize problems, and make decisions.

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4.3.9 Compare an approved plan to an existing fire protection system, given approved plans and field observations, so that any modifications to the system are identified, documented, and reported in accordance with the applicable codes and standards and the policies of the jurisdiction.

(A) Requisite Knowledge. Fire protection symbols and terminology. (B) Requisite Skills. The ability to read and comprehend plans for fire protection systems, observe, communicate, apply codes and standards, recognize problems, and make decisions.

4.3.10 Verify that emergency planning and preparedness measures are in place and have been practiced, given field observations, copies of emergency plans, and records of exercises, so that plans are prepared and exercises have been performed in accordance with applicable codes and standards and deficiencies are identified, documented, and reported in accordance with the applicable codes and standards and the policies of the jurisdiction.

(A) Requisite Knowledge. Requirements relative to emergency evacuation drills that are required within the jurisdiction, ways to conduct and/or evaluate fire drills in various occupancies, and human behavior during fires and other emergencies.

(B) Requisite Skills. The ability to identify the emergency evacuation requirements contained in the applicable codes and standards and interpret plans and reports.

4.3.11 Inspect emergency access for an existing site, given field observations, so that the required access for emergency responders is maintained and deficiencies are identified, documented, and corrected in accordance with the applicable codes, standards, and policies of the jurisdiction.

(A) Requisite Knowledge. Applicable codes and standards, the policies of the jurisdiction, and emergency access and accessibility requirements.

(B) Requisite Skills. The ability to identify the emergency access requirements contained in the applicable codes and standards, observe, make decisions, and use measuring tools.

4.3.12 Verify code compliance for incidental storage, handling, and use of flammable and combustible liquids and gases, given field observations and inspection guidelines from the AHJ, so that applicable codes and standards are addressed and deficiencies are identified, documented, in accordance with the applicable codes and standards and the policies of the jurisdiction.

(A) Requisite Knowledge. Classification, properties, labeling, storage, handling, and use of incidental amounts of flammable and combustible liquids and gases.

(B) Requisite Skills. The ability to observe, communicate, apply codes and standards, recognize problems, and make decisions.

4.3.13 Verify code compliance for incidental storage, handling, and use of hazardous materials, given field observations, so that applicable codes and standards for each hazardous material encountered are addressed and deficiencies are identified, documented, and reported in accordance with the applicable codes and standards and the policies of the jurisdiction.

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(A) Requisite Knowledge. Classification, properties, labeling, transportation, storage, handling, and use of hazardous materials.

(B) Requisite Skills. The ability to observe, communicate, apply codes and standards, recognize problems, and make decisions.

4.3.14 Recognize a hazardous fire growth potential in a building or space, given field observations, so that the hazardous conditions are identified, documented, and reported in accordance with the applicable codes and standards and the policies of the jurisdiction.

(A) Requisite Knowledge. Basic fire behavior; flame spread and smoke development ratings of contents, interior finishes, building construction elements, decorations, decorative materials, and furnishings; and safe housekeeping practices.

(B) Requisite Skills. The ability to observe, communicate, apply codes and standards, recognize hazardous conditions, and make decisions.

4.3.15 Determine code compliance, given the codes, standards, and policies of the jurisdiction and a fire protection issue, so that the applicable codes, standards, and policies are identified and compliance is determined.

(A) Requisite Knowledge. Basic fire behavior; flame spread and smoke development ratings of contents, interior finishes, building construction elements, life safety systems, decorations, decorative materials, and furnishings; and safe housekeeping practices.

(B) Requisite Skills. The ability to observe, communicate, apply codes and standards, recognize hazardous conditions, and make decisions.

4.3.16 Verify fire flows for a site, given fire flow test results and water supply data, so that required fire flows are in accordance with applicable codes and standards and deficiencies are identified, documented, and reported in accordance with the applicable codes and standards and the policies of the jurisdiction.

(A) Requisite Knowledge. Types of water distribution systems and other water sources in the local community, water distribution system testing, characteristics of public and private water supply systems, and flow testing procedures.

(B) Requisite Skills. The ability to use Pitot tubes, gauges, and other data gathering devices as well as calculate and graph fire flow results.

4.4 Plans Review.

There are no plan review job performance requirements for Fire Inspector I.

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APPENDIX B

Fire Inspection questionnaire

1) Please list the components (5) of the Town of Algoma outdoor burning ordinance.

1

2

3

4

5

Electrical

2) An office cubical is found to have an extension cord powering a small refrigerator. The cord is heavy duty contractor grade. Is this acceptable?

Yes No Unsure

3) As you walk through the basement of an apartment building you notice this. The maintenance person stated the wiring was open so he capped the ends with wire nuts and taped them. Is this acceptable?

Yes No Unsure



4) A office worker has this device under his/her desk. It is fused and has a UL listing. Is this acceptable?

Yes No Unsure



5) What is the minimum clearance distance needed around electrical panels?

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Fire Extinguishers

6) How often should extinguishers be visually checked and the check recorded?

7) How often should an extinguisher be serviced by a certified technician?

8) What type of extinguisher is this and where should it be located?



9) A business owner has a proper sized and type of extinguisher for his/her occupancy. The extinguisher is placed on a window sill in plain view. Is this acceptable?

Exits

10) A business owner has an exit sign above a door printed on cardboard stock. Is this an acceptable exit sign?

Yes No Unsure

11) As you walk through a business, an owner tells you he has moved cleaning supplies in a hallway to ensure there is an exit path. You see the below. Is this acceptable?



Yes No Unsure

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12) A restaurant has a small table and two chairs partially in front of a rear exit door. The owner tells you they only use this table on Friday nights when its busy and it can be moved easily in case of fire. Is this acceptable?

Yes No Unsure



13) A business has expanded into an adjoining office suite and would like to increase its occupancy. The door on the left leads directly to the outside of the building. Is this an acceptable exit?

Yes No Unsure

14) A local church has a slide bolt on there rear exit door to prevent break-ins. No key is required to open the lock. The slide bolt is located above the door knob. Is this acceptable.

Yes No Unsure

15) Are fire drills required to be held at schoos. If so how often do schools need to hold fire drills?



16) This exit sign is equipped with emergency lighting. Does this lighting need to be tested if so how often?

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General Precautions Against Fire



17) You find this space heater in an office cubicle. It is U.L listed and placed away from combustibles. Is this acceptable?

18) You enter a boiler / mechanical room. Storage is neat and orderly. Is this acceptable?

Yes No Unsure

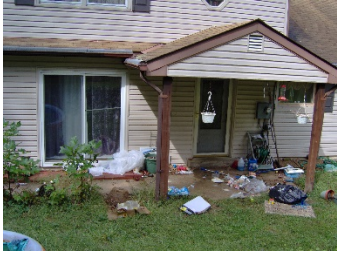


19) You notice a gas grill on a non-sprinkled balcony of an apartment building. The owner states the tenants only store the grill on the balcony and bring it out to the yard when used. Is this acceptable?

Yes No Unsure

20) When using a grill how far from the building must the grill be?

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21) As you inspect an apartment complex you notice a large amount of combustible material on the outside of one of the units. The renter becomes agitated and states, it's their right to be messy if they want to, and they pay rent here. Is this a code violation?

Yes No Unsure



22) As you walk through an auto body shop you see this 2 ½ gallon gas can sitting in the corner. Is this a violation?

Yes No Unsure

23) Dose an ANSUL type kitchen hood suppression system need to be tested and inspected? If so how often?

24) Are there testing or inspection requirements for a hood system itself?

Yes No Unsure

NFPA

25) A commercial property has a roll up fire door hooked into the alarm system. After initial installation testing and inspection are there any other requirements for testing and inspection? If so how often?

26) A company has a private fire hydrant on their property, is this hydrant required to be flow tested?

Yes No Unsure

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27) How often should this device be tested?



28) How often should this supervised fire alarm panel be serviced by a qualified technician?



29) What are the service intervals for sprinkler systems?

30) What is the testing requirement schedule for a diesel fire pump? (We do have an occupancy with this type of pump)

THANK YOU!

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APPENDIX C

Questionnaire Results

Question 1 local Ordinance

Elements of the TOAFD Outdoor Burning Ordinance **proficient = 7%**

1. Burn is attended
2. Extinguishment provided
3. Clean wood only
4. Three foot diameter
5. Wind speed under 10 mph

1 Element listed-6

2 Elements listed-1

3 Elements listed-5

4 Elements listed-1

5 Elements listed-1

Question 2 – 5 Electrical Codes **Section Average 63%**

Question 2	Yes	7		NFPA 1- 11.1.7.6
	No	6	42%	
	Unsure	1		

Question 3

	Yes	3		11.1.10
	No	11	78%	

TRAINING FOR COMPANY LEVEL FIRE INSPECTORS

	Unsure	0		
Question 4				11.1.6.1
	Yes	10	71%	
	No	4		

Question 5

What is the required distance for ordinary combustibles from the electrical panel? (3ft)

Correct	9	63%	11.1.3
Incorrect	5 (3-unsure) (2ft) (5ft)		

Questions 6-9

Fire Extinguishers

Section Average 51.5%

Question 6				13.6.9.2.1.2
	Monthly	5	35%	
	Unsure or Other	9		
Question 7				13.6.9.3.1.1
	Annual	9	64%	
	Unsure or Other	5		
Question 8				13.6.8.6
	Type K	8	57%	
	Other	6		
Question 9				13.6.8.1.3.4
	Yes	6		
	No	7	50%	
	Unsure	1		

TRAINING FOR COMPANY LEVEL FIRE INSPECTORS

Questions 10-16 Exits

Question 10 14.14.1.2.1

Yes 0

No 14 100%

Question 11 14.4.2.1

Yes 0

No 14 100%

Question 12 14.4.2.1

Yes 2

No 12 85%

Question 13 14.5.1.2

Yes 11

No 3 21%

Question 14 14.5.2.3

Yes 4

No 10 71%

Question 15 10.6.1

Yes 10 71% and 14%

No 1

Unsure 3

Unknown-4 Twice a year – 8 Annual-1 Monthly-2

Question 16 14.13.2.1

Yes 9 3-Quarterly 4-Annual 2-Monthly and annually

No 0 64% and 14%

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Unsure 5

Questions 17-22 General precautions against fire

Question 17 10.1.7

Yes 10 71%

No 3

Unsure 1

Question 18 10.19.5.1

Yes 7

No 7 50%

Question 19 10.11.6.2

Yes 4

No 10 71%

Question 20 10.11.6.1

2-Unsure 2-3ft 2-5ft 6-10ft 2-20ft 42%

Question 21 10.16.4

Yes 7

No 7 50%

Question 22 66.9.4.1

Yes 6 42%

No 5

Unsure 3

Questions 23-30 Fire Alarm and Suppression systems

Question 23 50.1.1

Yes 8 Annual-4 Bi-annual-4 57% and 54%

No 5

TRAINING FOR COMPANY LEVEL FIRE INSPECTORS

	Unsure	1			
Question 24					50.1.1
	Yes	8	Cleaning-8	57%	
	No	3			
	Unsure	3			
Question 25					12.4.6.6.1
	Yes	10	Annual-8	6 mo.-2	71% and 57%
	No	0			
	Unsure	4			
Question 26					NFPA 25
	Yes	12	85%		
	No	2			
Question 27					NFPA 72
			5- Annual 4-6 mo. 3-Unsure 1-No testing required	35%	
Question 28					NFPA 72
			5-Annual 5-6 mo. 2-Unsure 1-No testing required	35%	
Question 29					NFPA 25
			1-(5yr, Annual, Quarterly) 10-(Annual) 3-(Unsure)	7%	
Question 30					NFPA 25
			8-(Unsure) 4-(Annual) 2-(Monthly)	14%	