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Effective Code Enforcement in Public School Facilities

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CERTIFICATION STATEMENT

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

Signed: _____

Abstract

The past four years the Nixa Fire Protection District has inspected public schools for fire safety violations. During inspections similar fire code violations continued to surface such as blocked exits and compromised fire systems. Research was conducted to determine how to improve life safety in public schools and establish a public safety standard. The study identified how fire safety information was provided to the school system, firefighters, code compliance and planning of educational facilities. Research determined where the effectiveness of the information and coordination of code requirements were lacking. Surveys, review of literature and internet searches were conducted and the study found information was not getting to the classroom level. It appeared frequent feedback and reeducation process was needed.

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Effective Code Enforcement in Public School Facilities

Introduction

Proper planning and preparation prior to a crisis can stop the loss of life and lower damage to property (U.S. Department of Education, 2007). The Nixa Fire Protection District represents a modern, fast growing community providing a high quality of life to its citizens. The goal of providing a safe learning environment is shared by the District and the Nixa R-II School District, but the effectiveness of code enforcement in public educational facilities has been a challenge in recent years. According to a United States Fire Administration report incendiary, cooking, and heating are all major causes for school fires (United States Fire Administration [USFA], 2007). The problem is despite four years of routine fire inspections similar fire code issues such as blocked exits and compromised fire systems continue to resurface in public schools in the Nixa Fire Protection District.

The research purpose is to improve life safety in public schools, insure consistent code compliance and a public safety standard in the Nixa Fire Protection District. Descriptive research was performed to answer research questions. The research was based on the following questions:

1. How are public school systems educated about code enforcement activities?
2. How are different crews, stations, and shifts ensuring consistent fire code compliance when inspecting public schools?
3. How are code enforcement officials involved in educational facility planning and code compliance throughout the year?
4. How are teachers and school staff informed and educated about code requirements throughout the school year to ensure continued compliance?

Background and Significance

The Nixa Fire Protection District is located in southwest Missouri five miles south of Springfield, Missouri. The District encompasses 53 square miles of Christian County and includes the City of Nixa. The District was incorporated in 1986 during a public vote in consolidation of the rural and city fire departments. Missouri Revised State Statutes Chapter 321 governs the inception and operations of Fire Districts and independent authority as a political subdivision. The City of Nixa is considered a suburban bedroom community to the Springfield Metropolitan area.

When the District was formed it was volunteer based. Since 1986 the organization has grown rapidly. Christian County is one of the fastest growing counties in the state of Missouri (U.S. Census Bureau, 2000). According to the U.S. Census Bureau data, Christian County experienced a 46% increase in population growth and the City of Nixa a 27% increase in population since 1990. The rapid growth places Christian County 28th in the fastest growing counties in the nation (U.S. Census Bureau, 2000). The rapid growth has contributed to the expansion of the Fire District and the Nixa R-II School District.

In September 2002 the administration element of the Fire District was replaced. For the first time since inception the fire chief position was hired from outside the organization. Prior to hiring a new fire chief fire prevention and code enforcement did not exist. In January 2003 a prevention bureau was established with the promotion of an assistant chief. Code enforcement and fire prevention became a priority for the District. Prior to 2003, inspections had not been conducted in the public school district. Only visits for fire safety education and fire station tours where being used to educate students.

In 2001, the District adopted by ordinance the 2000 Edition of the International Fire Code. Without proper staffing and consistent enforcement the fire code was left alone with only minor involvement in issues from the previous administration. The author recalls this time period because only certain codes were examined to benefit the use for the developer leaving little concern for fire safety issues. Additionally, building code and regulation exists within the City of Nixa aiding in concerns, but the unincorporated areas of the District have no regulation. All Nixa R-II School District facilities were within the city limits but once the building was erected building code officials did not visit the premises unless demolition, renovation, or new buildings were erected.

Starting in 2003, the District began occupancy inspections with the use of the Fire Prevention Officer and engine company inspections. Included in the occupancy list were the school district facilities. The relationship between the school district and the fire district was established several years prior by the involvement of District personnel in multiple functions supporting athletic activities and emergency preparedness. The positive relationship was a large factor in the initial conception of fire and life safety inspections in Nixa schools. The assurances and benefits of conducting a fire safety inspection on school premises appealed to school administrators and the inclusion of conducting fire drills upon the inspection visits was felt to be appropriate.

The first year of inspections were met with an open door and moved slowly throughout the public school system. The fire prevention officer with the aid of an engine company spent the initial year becoming familiar with inspection processes and a large amount of fire and life safety violations found in each facility. Even though upper administration of the school system was supportive of the facility inspections, individual facilities, faculty, and staff were very

skeptical. The author recalls inspecting one school facility identifying violations in minutes, but educating occupants and identified stakeholders taking hours. The 2003 school inspections focused on educating school administration, faculty, staff, and parents on the basis and requirements of fire and life safety requirements.

Inspections in subsequent years in school facilities generated resistance from new or transfer employees of the school district. Several violations were found in classrooms where previous violations of the same nature were corrected. Engine crews and inspectors reported resistance from school district employees in correcting items they felt interfered with the learning environment. School district administration quickly dealt with the issue and the items were corrected. However in each subsequent inspection cycle the same or similar items reoccurred. School district employees also explained to crews and inspector that most items were only fixed before or during inspections then returned to their previous state. Additionally, teachers did not experience repercussions from not correcting the items by building administrators.

Much progress has been made in the inspection process including additional staffing for the prevention bureau. Through each year's inspections new questions arise and school administration continues to support the program. However, inspections conducted in each facility continue to render similar results found years previous. Essential fire and life safety systems and code violations continue to present constant code enforcement challenges. Modifications and renovations continue to violate fire and life safety codes. Each issue presents a significant risk to building occupants and firefighters. Correction of code violations will directly impact the effectiveness of emergency procedures in the school district and firefighting operations including time for occupants to evacuate safely.

This research project relates to the Executive Fire Officer's *Executive Development* course discussed in the Change Management unit. It directly applies to varying approaches and methods to be an agent promoting change throughout the fire department and community (U.S. Department of Homeland Security, 2006, p. SM 3-8). This paper directly relates to three of the five United States Fire Administration operational objectives. Focusing on the first three objectives of "target audiences 14 years of age and younger, 65 years of age and older and firefighters" (United States Fire Administration, 2007).

Literature Review

The *Manual for Fire and Building Safety Inspections in Public and Nonpublic Schools* (2004) explains school facilities should be inspected on an annual basis. The report *School Fires* (2007) recognizes the importance of fire safety and school safety practices to be integrated to maintain proper security and safety for building occupants. The report continued and acknowledged "fire safety experts have increasingly been asked to work in conjunction with security advisors to recommend security procedures that are consistent with the needs of fire safety" (U.S Fire Administration, 2007). The United States Department of Education recommends schools connect with local fire authorities to determine the appropriate level of safety (U.S. Department of Education, 2007). There were no federal requirements found for public school districts to mandate fire and life safety inspections are requirements. The Americans with Disabilities Act of 1990 does include an inspection section for state and local code compliance but the language was ambiguous in nature and the author was unable to determine if there was a duty to inspect or the obligation was left with the building owner (U.S. Department of Justice, 2006).

While many inspection requirements and criteria can be determined by local fire authorities, many are based on state and federal guidelines, procedures, regulations, and standards (Corbett, 2001). According to the International Code Council's web site, 26 out of 50 states have adopted an edition of the International Fire Code (2007). States or territories that do not have a version of the International Fire Code are 27 of 53 (International Code Council, 2007). Missouri is one state without a statewide adopted fire code (International Code Council, 2007). Missouri Revised State Statutes Section 312-220, Paragraph (12) gives the Board of Directors the power to adopt by ordinance a recognized fire code (State of Missouri, 2007). In October 2005 the Nixa Fire Protection District adopted the 2006 Edition of the International Fire Code (Nixa Fire Protection District Ordinance, 2006).

Research also indicated there is a variance in the amount of inspections which may be needed in a public school. According to the *Fire and Life Safety Inspection Manual* (2002) educational occupancies may include several buildings and features needing inspection upon notification of hazard, when the systems are installed, maintained and used (250). The Missouri Department of Elementary and Secondary Education (DESE) provides a *Safe Facilities Guide* for public schools to follow (University of Missouri-Columbia, 2007). The document provides many recommendations for public schools to follow. But the document falls short of requiring public schools to follow the recommendations and checklists but rather leaves the person following the information with subjective or interpretative limitations.

The Missouri Department of Health and Senior Services (DHSS) requires schools which house child daycare centers, after school programs, and special education to meet requirements established by the DHSS and the Missouri Division of Fire Safety, State Fire Marshal's office (State of Missouri). DHSS ties licensing of child care facilities to fire and life safety inspections

conducted by the State Fire Inspectors. Schools which house facilities requiring licenses by the state are regulated by DHSS and are required to be inspected annually and follow "the latest edition of the National Fire Protection Association (NFPA), Chapter 101, *Life Safety Code*" (State of Missouri, 2007, p. 13).

The report *School Fires* by the National Association of State Fire Marshal's Catastrophic Fire Prevention Task Force indicated the need for limiting the "sheer volume of fuels in schools" to eliminate rapid fire spread (2001). The report was based upon past research of "severe fires in schools" (Catastrophic Fire Prevention Task Force, 2001). From the report four recommendations were made. Recommendation 2 of the report focused on getting the information to the schools through cost effective methods for "immediate" results (Catastrophic Fire Prevention Task Force, 2001).

Due to the complexity of the problem the author also researched methods for strategic management and change. For change to be successful communication must be effective and pronounced to every level involved in the change (Wheelen & Hunger, 2008). In order to incorporate a change in organizational practice an analysis of factors influencing the change should be completed (Wheelen & Hunger, 2008). The importance of identifying an action plan to implement change should be based upon actions, time frame, who is responsible, and the desired results (Wheelen & Hunger, 2008).

Procedures

The purpose of this applied research project is to improve life safety in public schools, insure consistent code compliance and a public safety standard in the Nixa Fire Protection District. The research conducted was descriptive in nature explaining how national, state, and local codes impact and direct inspections in public school facilities. The research procedure used

for this project included three literature reviews, five surveys, internet research, and review of the Districts current inspection practices.

Initial research began at the National Fire Academy Learning Resource Center in July 2007. One literature review was conducted at the Learning Resource Center, a second was conducted at Ozarks Technical Community College in Springfield, Missouri, in October 2007, and a third literature review was conducted at the Nixa Fire Protection District Headquarters, November 2007. The internet research began at the Learning Resource Center and continued throughout the life of the project. Information obtained through the internet research included Missouri State Statutes, Missouri Public Schools Safety Program, National Fire Protection Association Standards, National Association of State Fire Marshals, and the Missouri School Board Association. The internet was also used to obtain information from the U.S. Census Bureau and local government agencies.

The National Fire Academy's online card catalog was used to locate other applied research projects, articles and information on fire safety in public schools, fire inspections in educational occupancies, and code enforcement practices. Additional sources from the author's library, local school district, and city building and regulations department were also used for non fire service based information.

The following surveys were conducted:

1. Fire Protection Districts in Missouri: to determine the status of inspections in public school systems, frequency and common violations. The survey was internet based and distributed through e-mail using the Missouri University Fire Rescue and Training Institute (MUFRTI), Fire Marshals Association of Missouri (FMAM), the Missouri Professional Fire and Fraud Investigators Association (PFFIA), and Missouri Valley Division of the International

Association of Fire Chiefs (MOChiefs) server lists. A copy of the survey questions can be found in Appendix A.

2. Nixa Fire Protection District employees: to determine if education and enforcement was effective and equally enforced while conducting public school inspections. The survey was internet based and distributed through the District email system. A copy of the survey questions can be found in Appendix B.

3. Nixa R-II School District: to determine if school administrators, faculty, and staff embraced and represented fire code requirements and code enforcement as a priority. The survey was internet based and distributed through the school district email system. A copy of the survey questions can be found in Appendix C.

4. School Districts in Missouri: to determine if other school districts included a regularly scheduled fire and life safety inspection. The survey also determined if administrators, faculty, and staff embraced and represented fire code requirements and code enforcement as a priority. The survey was internet based and distributed through the Missouri School Board Association email list. A copy of the survey questions can be found in Appendix D.

5. Parents of Nixa R-II School District students: to determine the perceived level of focus on fire and life safety of parents from their children who attend school in the public school system. The survey was internet based and distributed through the Nixa R-II School District Key Communicator and Quick News Network and the school district contact list for parents as a link to take the survey. A copy of the survey questions can be found in Appendix E.

Assumptions and Limitations

An assumption was made that each survey question was understood by the individual taking the survey and the selected target audience areas. It was also assumed each survey was

completed by an individual who had knowledge and authority to answer each question, or had the resources to obtain the answer. Other assumptions on this applied research project were the information and data available, time required, levels of involvement from multiple levels of city, county, and state government, and the collection of survey data.

Limitations on this project also played a role. All of the surveys distributed obtained a low response and return with an exception of the Nixa firefighter survey. There are over 841 fire protection districts, fire departments and fire protection associations in Missouri. A total of 75 out of 841 returned the survey leading to a 9% response rate. Had a larger sampling been obtained the results may have varied. A survey distributed to all personnel with the Nixa Fire Protection District contained a 100% response rate from personnel. To assure a 95% confidence level 28 out of 30 surveys were used. A survey was distributed to just under 700 Nixa R-II School District employees with 132 surveys returned equaling a return rate of 19%. If a larger sample from the school district was obtained the results might have varied. A survey distributed to Missouri school districts obtained a similar low response of 52 out of 524, equaling a return rate of 10%. The survey distributed to the parents of students performed similarly to the other low return rates. An estimate established through student numbers of 5300 surveys for 100% return rate from parents was limited by physical time constraints and survey return amounts. A total of 750 surveys were released randomly with a return of 219 equaling a 29% return rate of the sample. Had a larger number of parents responded the results might have varied.

Other limitations to this project included a lack of information from similar code requirements for inspections in public schools. Missouri has not adopted a statewide fire code allowing for local jurisdictions to adopt a code specific to their need. Very little statistical information was available from state and local agencies concerning public school fire

inspections. Additionally, different state agencies had varied responsibilities with public schools. Jurisdictional authority among state agencies made obtaining consistent data difficult.

Definition of Terms

Fire and Life Safety Inspection: an inspection conducted to identify hazards to life and safety in an occupancy that requires corrective action upon discovery of hazards.

Jurisdictional authority: the authority of a government agency or organization to set requirements and performance standards to a subordinate agency.

Key Communicator and Quick News Network: The Nixa, Missouri, R-II School District email and phone network established to communicate with the community, parents, stakeholders, and students.

Target Audience: The parties selected for distribution of surveys based upon their level in the research process or stakeholder in the fire and life safety inspection process in public schools.

Results

Results from this project produced answers to each research question contained in the introduction. The first research question dealt with education of school districts concerning code enforcement. The survey results indicated 56% conducted a meeting with individual school principals or maintenance staff to inform and discuss code enforcement activities. In the education process 11% indicated a meeting prior to the inspection process. Coordination with a district wide representative for each school district represented 6%.

However, 65% of fire jurisdictions indicated participation in the fire drill process at least once annually. School Districts indicated 55% of administrators, staff, and faculty had enough information to create a safe environment and adhere to fire and life safety code requirements.

Additionally, 75% of schools surveyed felt it would be beneficial for fire jurisdictions to conduct a fire safety forum to discuss fire and life safety code requirements.

Consistent code compliance concerns generated few results outside of the Nixa Fire Protection District survey. Of the fire jurisdictions surveyed 68% indicated the inspections of public schools are assigned to fire prevention personnel. Both fire jurisdictions and school district authorities varied on determining consistent results. Results indicated 80% of fire jurisdictions indicated fire and life safety inspections were conducted and enforced consistently ensuring code compliance. Public school officials indicated a slightly lower number of 53% of fire and life safety inspections were consistent and effective. Table 1 and Table 2 show the data to conclude the effectiveness of inspections from fire jurisdictions and school district officials.

Table 1

Consistent and Effective Inspections – Fire Jurisdictions

Never	Rarely	Sometimes	Usually	Always
1%	4%	14.6%	64%	16%

Table 2

Consistent and Effective Inspections – School Districts

Never	Rarely	Sometimes	Usually	Always
0%	.025%	.075%	50%	40%

Data collected to establish involvement of code enforcement officials in the public school systems throughout the year was limited by a low response. Of those who responded 28% indicated involvement in planning and code compliance throughout the year. There were various amounts of information with the planning and involvement of code officials in the public school

system throughout the year with 52% of respondents stating different levels of involvement. The various levels of involvement ranged from plan review or initial contact with the inception of a building to participating in school planning committees throughout each year. Of those who were involved throughout the year the most common term used was “emergency planning.” The identification of who was involved in the planning and future growth of public schools was ambiguous. Not every response notated who in the fire jurisdiction took part in the planning and growth of the public school system.

An additional focus of the research was to determine how public school administration, staff, and faculty kept current on code requirements and maintained code compliance throughout the year. The results from the Nixa R-II School District indicated 71% of the school district was provided enough information and clear expectations of fire and life safety inspections. The results also explained the various levels school district personnel were informed of the requirements. The information and expectations were most often relayed through school administrators and principals. The information also indicated 49% of respondents are aware of fire and life safety code requirements but would like a written explanation or checklist to reference throughout the year. The results also indicated that 67% requested a fire safety forum is needed to discuss fire code requirements. School personnel also indicated 49% were trained about fire safety and fire inspection requirements rarely. However, 35% indicated enough information was not received to help understand fire code requirements.

Results also indicated 89% felt the training of custodial and maintenance staff would increase the effectiveness and monitoring of fire and life safety code requirements throughout the school year. The Nixa R-II School District survey results indicated 99% of respondents rate the fire safety in the school district as average to excellent. Information from the survey also

indicated 78% view fire code requirements positively impact learning. Results indicated 61% had someone appointed as a fire safety representative or person who watches for fire code violations in a school.

Fire jurisdictions and code enforcement officials indicated 95% that responded to the survey had adopted a fire code and 75% were operating under an edition of the International Fire Code. A similar response was received for fire inspections conducted in public schools with a higher percentage of 97% performing inspections in schools. Respondents indicated a majority of the inspections were annual rotations. An overwhelming majority or 73% of jurisdictions did have a policy, procedure, or guideline in place for inspections. Only 24% had a policy, procedure, or guideline specifically for public school inspections. Along with code compliance and education of the inspection process additional information was obtained about the most common violations found in public schools. The data was used to determine the level of violation and the relation to the understanding of requirements by inspectors, school staff, and code enforcement officials. Table 3 shows the types of common infractions found in public school inspections. Each violation is listed by the highest percentage of response and by the type of violation. The most common violation is listed at the top and the category marked “other” were nondiscriminatory items not classified by the categories of the survey. The responses included in Table 3 are from code enforcement officials and inspectors.

Fire jurisdictions and code officials also indicated certain school district officials manage fire and life safety. Positions indicated for fire and life safety requirements in schools 82% of respondents indicated there was someone assigned to handle the responsibility. The most common parties assigned management of fire safety requirements were maintenance staff,

principals, director of facilities, and school resource officer. Results indicated 99% fire jurisdictions and code officials felt fire and life safety inspections were needed in schools.

Table 3

Common violation(s) found in public schools

Type of violation	Response
Extension cords used for permanent wiring	63.8%
Non-functioning exit and/or egress lights	50.7%
Blocked exits	29.0%
Other	29.0%
Flammable or excessive material hanging from ceilings	21.7%
Lack of fire drills/documentation	14.5%
Fire protection equipment not in service	14.5%
Lack of emergency vehicle access to building	7.2%
Blocked sprinkler heads	2.9%
Non-flame retardant drapes in auditorium	2.9%

Results from the Nixa Fire Protection District employee survey followed trending of the fire department and code enforcement official's survey. Firefighters indicated 95% of the time inspections were conducted and enforced effectively and equally across companies and shifts with 65% indicating fire inspections should be conducted annually, 30% twice a year and 5% more than twice a year. Ninety percent of firefighters felt comfortable and familiar with code requirements and conducting inspections in public schools. Consideration of the lack of support from the administration and fire prevention level was explored and 80% of firefighters indicated adequate support and training was provided before, during, and after public school inspections. Feedback from the companies conducting previous public school inspections indicated 55% felt

school staff and teachers were familiar with fire code requirements and the inspection process. Only 10% of firefighters were aware public school districts are mandated by state and federal governments to take actions or demonstrate practices that can conflict with fire and life safety code requirements.

Surveys sent to parents of students within the Nixa R-II School District offered limited results based on the percentage of return and confidence level. The results from the parent survey though limited provided the following results displayed in Table 4. Table 4 identifies the knowledge of each parent surveyed and the overall perception from the information given from the student to the parent. The survey also gave the parent the opportunity to identify the level of fire safety in a school based upon the level and frequency determined by the survey respondent. The questions from the survey directly correlate with the answers given in the table and the order in which each question was answered with the response next to the appropriate category.

Table 4

Parent(s) Fire Safety Survey Results

Survey Question	Response
Level of fire safety in school district buildings	Above Average
Knowledge of inspections	45%
Increases the level of safety	100%
Believes fire inspections are effective	90%
Child feels fire safety is a focus	75%

The Missouri school district survey though low in return generated interesting results. The school district name and geographical data was obtained with a wide response from mainly the most populated areas of the state. A majority or 95% of school district officials who filled

out the survey were school principals or superintendents. The frequency of fire and life safety inspections in public schools was noted to be conducted by the local fire jurisdiction to alleviate any problems with a school district referencing personnel performing an internal inspection. Results from the survey showed 20% of school districts were not inspected and 100% of respondents indicated the schools should be inspected for fire and life safety violations. An annual inspection was the most popular inspection with 85% of respondents and biannual inspections were another 10%. Every public school surveyed indicated fire drills were performed throughout the year. Similar to the Nixa R-II School District survey 89% of school districts indicated fire inspections impact learning positively.

The hypothesis concluding the need for more information and education of fire code requirements and expectations of fire and life safety inspection in the Nixa Fire Protection District was proven true based on survey results and the above mentioned data. The hypothesis fire safety lacked importance in the Nixa R-II School District was proven false with the limited survey returns from parents, teachers, firefighters, and school administrative officials.

Discussion

The research project parallels the findings of others found in the literature review. Public schools present a significant hazard to occupants and firefighters. Hazards left untouched or not properly regulated based on tested standards and codes can significantly increase the likelihood of a large loss of life and damage to a community. A safe and reliable atmosphere for students, faculty, and staff along with first responders should maintain a high priority. Study results indicated the lack of information provided for teachers and building administrators contributed to problems with reccurring fire and life safety code violations. To complicate matters, Missouri currently does not have a statewide fire code. Lack of a statewide fire code creates the reliance

on individual fire jurisdictions to adopt and regulate a fire code for individual school districts to follow. The study found multiple versions and different fire codes were used across the state, contributing to the confusion on the local level. School district employees who came from other schools found different requirements based upon location and level of fire department involvement. The study did find most fire jurisdictions are slowly moving toward similar codes and editions.

The education of school districts has been left up to the local jurisdictions and a self learning process by motivation from state agencies for accreditation and distinction processes for public school district. However, the state level recommendations are not based upon a site visit but an internal review. There was no standard of information other than found with the Department of Health and Senior Services and Division of Fire Safety to regulate schools that contain child care centers, after hours care, and special education programs. Inspections in areas regulated by those requirements were found to have fewer violations because it is tied to licensing of the occupancy.

The study also found little or no information was getting to the teacher level. This could be contributed to the inspection process which involves the facility representative and the principal. Upon conclusion of the inspection, inspectors leave the information after a closing interview with the designated officials. The facilities and maintenance director coordinated with the individual campus to correct the items. Teachers and other staff sporadically received feedback. The information at the classroom level was inconsistent where the teachers can be informed and monitor practices. Annual inspections conducted as recommended by *Manual for Fire and Building Safety Inspections in Public and Nonpublic Schools* (2004) were completed but individual classrooms with violations left teachers puzzled. No form of punishment to

teachers for failure to comply with fire and life safety code requirements was realized or relayed. In areas where violations were found and immediately corrected the identification of new hazards did not exist.

The most common theme of the inspection process from the fire jurisdiction perspective was consistent fire code compliance. The identification of the fire prevention bureau of appointed fire marshal from other fire jurisdiction allowed for a consistent person or group of people to perform inspections in the schools. Currently, the Nixa Fire Protection District does not assign a particular group or inspector to public schools. The inspections are scheduled with the school district and assigned to different shifts, crews, and inspectors. The current process may impact the consistency of inspection criteria and results needed to correct fire and life safety code violations. Teachers and principals could build a better relationship with assigned personnel as a point of contact and building rapport for future problem areas with inspection.

As a whole the code enforcement officials for the fire district are heavily involved in planning of public school facilities. Much like the information received through this study the impact of stopping a problem before the building is erected and occupied works well. It seems to be after the occupation and use during the school year most code compliance issues come to light. This conclusion makes logical sense because of the students, teachers, and other people who occupy the building during this time frame.

A medium of communication established throughout the year with the classroom and building administrator level beyond the annual inspections coupled with the custodial or maintenance staff can be explored to reduce reccurring code violations. This study identified the need for further involvement at the classroom level not only by code enforcement officials but by school officials as well. An overwhelming majority agreed throughout the gathering of data,

inspections are effective in creating a safer environment and positive learning environment. All parties identified a stake in creating a safer environment.

Further study showed fire safety education classes were referenced several times as information about the fire and life safety code. Based upon this reference point the target audience is relating fire extinguisher training and fire safety demonstrations as information about code compliance. Little information was retrieved about why the inspections focused on other items not trained on throughout the school year. Survey questions about education of teachers and staff did not narrow the information enough to get the desired response.

The research design worked appropriately allowing for the target audiences and areas to be identified. The design allowed for the specific focus on large potential losses in the Nixa Fire Protection District in the event of a serious fire or emergency. The research questions contained several shortcomings. Each question was formulated based upon past identified problems with public school inspections with a large response anticipated. Additionally, the ability to trend future problems was limited based upon past problems. Time constraints and the size of survey audiences, response, and usable data were limited not by the author but by the respondents.

Results from the research aided in identifying the problems anticipated prior to the research. The communication and consistency of the education about the inspection process was brought forward. The realization of consistent enforcement and inspection identified a training issue for internal employees, a change in inspection assignments, and a new approach to educating the school district staff. More importantly, the strengthening of the professional relationship between parents, students, the school district, and the Nixa Fire Protection District was identified. The end result of a failure to comply with fire and life safety codes still has no

resolve. It is unclear whether enforcement action will provide sufficient motivation when school districts fail to comply with local fire jurisdictions.

Recommendations

The purpose of this research was to improve life safety in public schools, insure consistent code compliance and a public safety standard in the Nixa Fire Protection District. The problem was despite four years of routine fire inspections similar fire code issues such as blocked exits and compromised fire systems continued to resurface in public schools. The study confirmed unrecognized and unregulated operations in public schools do present a significant hazard to occupants and firefighters. Additionally the research identified opportunities for improving the inspection process in public schools, classroom identification of hazards, school and fire district coordination of information, and consistency of the inspection process. In large a basis through the use of fire and life safety codes in a way inspectors and teachers can proactively engage in up front discussions must be identified.

The implementation of a set inspector for public schools will allow for fire and school officials to communicate. Inspector positions already exist in the current organization makeup and coordination of each campus and school maintenance staff will be assigned to a single inspector to establish a direct line of communication. The inspector will coordinate all scheduling and site visits and maintain a level of two-way communication with school officials. The initial phase of implementing this recommendation will require a meeting with school officials to develop and sustain the information exchange. A public education process could also be used involving school children identifying hazards or violations in the classroom in the capacity of a junior firefighter. Each grade level could incorporate an activity varying by grade level.

On multiple occasions the survey respondents identified lack of information at the classroom level for identifying fire and life safety hazards. A fire safety forum will be established for the beginning, middle, and end of the school year at each campus location. The forum will facilitate discussion at the classroom level from inspectors communicating with teachers the fire and life safety code requirements and "what if" scenarios. Additional assistance during the forum session about the inspection process and involvement of the school maintenance staff will help identify hazards prior to any action. Training the school maintenance and custodial staff basic identification of fire and life safety hazards will be incorporated in the recommendation.

Next, the development of a checklist and common hazards in public schools information sheet for school administrators, staff, and faculty will be developed. The checklist and information sheet will allow for reference points from each level in the public school system and the sheets can be delivered in any scenario. The research identified teachers wanted a reference point to determine if actions in classrooms are safe when assembling, changing, or breaking down each classroom throughout the year. The information will also be posted on the fire district's web site available for download from an internet access point.

A letter supporting the adoption of International Fire Code at the state level should be delivered to the Missouri State Fire Marshal and Division of Fire Safety. The letter will assist in providing a more consistent and minimum standard of fire and life safety across the state. Additionally, the letter will include a recommendation to allow the Missouri State Fire Marshal the overall authority in dealing with fire and life safety issues in the state. Considering Missouri is one of the few states without a statewide adopted fire code the burden of adopting the code would be lifted from local jurisdictions.

Additional levels of communication with school district officials and fire district officials must be strengthened at the administrative level, establishing a frequency of meetings with school administrative officials prior to the inspection process rather than contacting the schools during the inspections and enforcement processes. The initial development of a communication line may require an educational process on the part of the assistant chief and school district administrative officials to identify a need for additional meetings. Federal, state, and local statistics can be used to identify the need. Inspections from previous years can also aid in the process. A benefit should be demonstrated from the meetings.

The benefits from successfully implementing the recommendations will allow fire and school officials the opportunity to identify hazards and actions that contribute to unsafe practices. The fire district will reduce violations in public school occupancies and build a stronger relationship with the Nixa R-II School District. The potential of an injury or death will be reduced, fire systems and building infrastructure will be maintained, and ultimately a public safety standard insured. Each organization will benefit the community by enhancing public safety.

Finally, monitoring and adjustment of recommendations should be a priority. Benchmarks should be based upon the progress of the recommendations and an assessment conducted at the completion of each recommendation. The assessment will guarantee successful implementation and feedback. Negative feedback should be used to identify future trends and aid in the planning process. All recommendations can be initiated by August 2008 prior to the beginning of the 2008-2009 school year. A lack of commitment will increase implementation time.

Researchers wishing to further evaluate the effectiveness of code enforcement in public schools should determine the size of audience needed to build a reliable sample. Performing other research methods may aid in narrowing additional results. The scope of research should emphasize the desired result without bias prior to research. A longer time frame for gathering research may be necessary for a large project or broader scope of research.

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Appendix A

Missouri Fire Protection District Survey

1. Please enter the name of your jurisdiction.
2. Please enter your city and state.
3. Has your jurisdiction adopted the fire code? If yes, what code and edition is used?
4. Are fire and life safety inspections conducted in public schools in your jurisdiction?
5. If fire inspections are conducted in public schools how often are they conducted?
    a. Semi Annually
    b. Annually
    c. Bi-annually
    d. Other
6. How are the inspections assigned?
    a. Company Inspections
    b. Fire Marshal / Prevention Bureau
    c. Individually assigned to firefighters
    d. Other
7. How is the school system(s) (faculty, staff, teachers, administration) educated and informed on fire code requirements and the code enforcement process? As an example, do fire officials meet with school employees on an annual basis to discuss and/or educate requirements and past violations prior to an inspection?
8. Are fire officials involved in emergency planning and future growth processes with your local school system? If yes please give a brief explanation.
9. Do you have a policy, procedure or guideline in place for inspections?

10. What is the most common violation(s) found in your jurisdiction at public schools?
    a. Blocked exits
    b. Blocked sprinkler heads
    c. Flammable or excessive material hanging from ceilings
    d. Non-functional exit and/or egress lights
    e. Lack of fire drills/documentation
    f. Non-flame retardant drapes in auditorium
    g. Extension cords used for permanent wiring
    h. Fire protection equipment and systems not in service
    i. Lack of emergency vehicle access to building
    j. Other (please explain)
11. Do you have a guideline, policy or procedure for conducting specifically public school inspections?
12. How are your school districts or school systems managing fire and life safety? (Do they have a representative assigned to that responsibility, or staff, etc?)
13. Do you feel fire and life safety inspections are needed in public schools?
14. In your jurisdiction, are fire and life safety inspections effective in reducing violations throughout the year, not just while conducting the inspection on the premises? Why?

Appendix B

Nixa Fire Protection District Employee Survey

1. Are inspections conducted in the public school system effective and enforced equally across companies and shifts?
2. Should inspections be conducted more than once a year in public schools?
    a. Yes, more than twice a year.
    b. Yes, twice a year.
    c. No, once a year is adequate.
    d. No fire inspections are needed in the schools.
3. Are you familiar and comfortable enforcing the International Fire Code while conducting inspections in public schools?
4. Do you believe fire inspections in public schools reduce the risk of fire, loss of life and promote community involvement?
5. Are codes being consistently enforced during inspections in public schools at the company level?
6. Does the Prevention Bureau/Organization offer adequate support and training before, during and after public school inspections?
7. Are the school staff and teachers familiar with fire code requirements and fire inspections processes?
8. How can the Fire District further educate public school faculty, teacher and staff of fire code requirements and the inspection process?
9. Do you know public school districts are mandated by state and/or federal governments to take actions or demonstrate practices that may conflict with the fire code?

10. Are Fire District employees involved in educational facility planning and code enforcement activities throughout the year?

Appendix C

Nixa R-II School District Survey

1. What is your school building?
2. Do you feel fire and life safety inspections should be conducted in the Nixa School District?
3. Are fire inspections effective in creating a safer environment?
4. Is there enough information provided explaining expectations of fire inspections? Why?
5. Would it be beneficial to hold a fire safety forum at your school to discuss fire code requirements?
6. Along with informing teachers of fire code requirements, would training custodial and maintenance staff increase the effectiveness and monitoring of following the fire code?
7. Is there someone appointed in your school as a fire safety representative and/or person who consistently watches for fire code violations and/or safety/risk reduction? Who?
8. How can the Nixa Fire District help with the integration of fire code requirements into the Nixa School District?
9. Currently fire inspections and fire drills are conducted at every school during the same time of the year. Would inspecting schools at different times of the year work well with a teacher's schedule?
10. How often are you trained about fire safety and fire inspection requirements? What type of training is provided?
11. At what level would you rate fire safety in the School District? Why?

12. How much information is given to help understand fire code requirements?

    a. None

    b. Very little

    c. Not enough to help

    d. Enough to understand

    e. All I need

13. How do fire code requirements impact learning?

    a. Positively

    b. Negatively

Appendix D

Missouri School District Survey

1. Please enter the appropriate information.
    a. School District Name
    b. City
    c. Zip Code
2. What is your position in the school district?
    a. Superintendent
    b. Administration
    c. Principal
    d. Teacher
    e. Service/Custodial Staff
    f. Support
3. Are fire and life safety inspections conducted in your school? If yes, how often?
    a. Bi-annually
    b. Annually
    c. Semi Annually
    d. Quarterly
    e. Bi-monthly
    f. Monthly
    g. Other, please explain.

4. Is there someone appointed in your school as a fire safety representative and/or person who consistently watches for fire code violations and/or safety/risk reduction? If yes, who?
5. How often are you trained about fire safety and fire inspection requirements? What type of training is provided?
6. Are fire drills conducted in your school?
7. What level would you rate fire safety in your school?
    a. Non existent
    b. Low
    c. Average
    d. Above average
    e. Excellent
8. How do fire code requirements impact learning?
    a. Positively
    b. Negatively

Appendix E

Nixa R-II School District Parent Survey

1. Please rate the level of fire safety in the school(s) your child attends.
    a. Non existent
    b. Low
    c. Average
    d. Above Average
    e. Excellent
2. Are fire inspections conducted by the fire department in Nixa schools?
3. Do fire inspections increase the safety of your child?
4. Based upon your observation and opinion, are the fire inspections effective?
    a. Yes
    b. No
5. Does your child feel fire safety is an important focus at school?