BUILDING EVACUATION PLANS: DO BUSINESSES PLAN TO EVACUATE
AND ACCOUNT FOR EVERYONE?

EXECUTIVE DEVELOPMENT

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ABSTRACT

Most business managers will agree that it is important to get employees and customers out of a building when an emergency occurs. The question is how many businesses actually plan for this situation?

The problem that this research addresses is that Evesham Fire-Rescue has never verified if businesses located in multiple story office buildings have developed building evacuation plans and if developed plans appropriately address the needs of all occupants, especially special-needs individuals such as the mobility impaired. The purpose of the research is to determine if businesses located in multiple story office buildings are developing building evacuation plans and if these plans appropriately address the evacuation of special-needs individuals. Historical and descriptive research methods using both a literature review and survey instrument were used to obtain information in order to answer the following research questions.

1. Are businesses developing evacuation plans?
2. Are businesses designing evacuation plans properly and addressing the evacuation of special-needs individuals?
3. After evacuating the building, do businesses account for employees on the exterior?
4. Do businesses train their employees on evacuation procedures?
5. What procedures should be in place to properly address the evacuation requirements of special needs-individuals?

The results of the research indicate that 35 percent of the businesses in multiple story office buildings develop evacuation plans. It was also discovered that very few of those
plans contain the recommended elements of an evacuation plan and even fewer incorporate any type of procedure to address the evacuation requirements of special-needs individuals.

It is recommended that the department develop an evacuation manual that explains the proper procedure to develop an evacuation plan including a section that addresses the requirements of special-needs individuals. It is also recommended that the department assign an officer to assist businesses with evacuation planning and public education to ensure that evacuation plans are properly developed.
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INTRODUCTION

Businesses want people in their buildings or offices for two main reasons, either to perform work or to purchase their products and/or services. The most important asset of a business is its’ people which not only includes the employees but also any visitors such as vendors, customers, contractors, or others who may be visiting (Higgins, 1991, p.9-30). Most often employers and employees enter their buildings day after day and do not consider what they would have to do if they were instructed to evacuate the building. Most individuals who enter a building will leave the building using the same route or exit every time. This conditioning or human behavior to use the main entrance/exit or the one they are most familiar with during an emergency can cause individuals to travel pass safe alternate routes in order to get one they are used to using (NFPA, 2001, p.188).

Most people will agree that it is important to get people out of a building when an emergency occurs. The question is how many businesses actually plan for this situation? There are certain types of occupancies or buildings that require the development of emergency or evacuation plans. In New Jersey, occupancies such as hospitals, nursing homes, and high-rise buildings require evacuation plans to be developed and practiced (NJ Code, 1996). In the State of New Jersey, multiple story office buildings often referred to as “Mid-Rises” are not mandated to have evacuation plans. Multiple story office buildings can offer many of the same type of evacuation challenges as high-rise buildings, such as multiple tenants, expansive floor areas, large number of occupants, and required use of the exit stairways from the upper floors in order to evacuate the building. In Evesham Township, all elevators are set-up to recall when the fire alarm is activated, which would require occupants on upper floors of the building to utilize the exit
stairways to exit during an evacuation (LaRosa, personal communication, July 18, 2002). While the New Jersey State Fire Prevention Code does not require evacuation planning for multiple story office buildings, other organizations such as the Department Of Labor (DOL, 2001) and the Occupational Safety and Health Administration (OSHA) recommend developing emergency-evacuation plans to protect yourself, your employees, and your business during an emergency even if your business is not required to do so (p. 1).

Employers may or may not know who is present or visiting the office each day. They also may not know if individuals who occupy the building have the ability to evacuate on their own or if they have special needs that would require assistance to help them exit the building. All these factors can hinder the evacuation of a building when an emergency strikes. In Fire Engineering, Juillet (Dec. 1993) discusses the problems encountered in the World Trade Center Bombing evacuation regarding breathing difficulties. She states “Neither the emergency personnel nor the people with respiratory difficulties considered what emergency procedures should be in place to deal with problems of pulmonary function disorders. Seven people interviewed described respiratory difficulties, explaining that the onset of symptoms can be triggered by stress, exercise, dust and smoke, or any combination “(p.102). The idea of evacuation planning is to evaluate all factors before a disaster strikes in order to ensure all individuals successfully evacuate the building when it is necessary. If the proper planning does not occur a disorganized evacuation can result in confusion and injuries to individuals (DOL, 2001, p.3).
The problem is that Evesham Fire-Rescue has never verified if businesses located in multiple story office buildings have developed building evacuation plans and if developed plans appropriately address the needs of all occupants, especially special-needs individuals such as the mobility impaired. For the purpose of this paper the definition of a special-needs individual is any person who requires assistance in evacuating the building. Individuals with special-needs may require assistance descending the stairs from upper floors. The term disabled and the definition of disabled are not used because it does not accurately define all those who would need assistance. Individuals that may need assistance to evacuate the building but may not fit in to the definition of disabled would include people with certain health problems such as asthma or people with a language barrier such as someone who only speaks Chinese.

The purpose of the research is to determine if businesses located in multiple story office buildings are developing building evacuation plans and if these plans appropriately address the evacuation of special-needs individuals. The research will be conducted using a literature review and survey instrument. Historical and descriptive methods were used to answer the following research questions.

1. Are businesses developing evacuation plans?
2. Are businesses designing evacuation plans properly and addressing the evacuation of special-needs individuals?
3. After evacuating the building, do businesses account for employees on the exterior?
4. Do businesses train their employees on evacuation procedures?
5. What procedures should be in place to properly address the evacuation requirements of special needs-individuals?

**BACKGROUND AND SIGNIFICANCE**

Evesham Fire-Rescue is an integral part of the Evesham Township Fire District. The district is a special-purpose district authorized by the laws of New Jersey. The Board of Fire Commissioners consist of five elected officials. The fire and rescue department operates from three separate fire and EMS stations operating under the control of the Fire Chief, with directions from the Board of Fire Commissioners (Carter, 1998, p. 1-2.).

Evesham Township is located in Burlington County, NJ and includes a mix of residential and commercial/retail properties, along with a large area of wildland urban interface. Our township is located in Southern New Jersey on the borders of Burlington and Camden Counties, and encompasses 30 square miles…. Our department is a combination career/volunteer agency that delivers both fire and EMS services to a rapidly growing community of over 42,000 residents…. We currently have 29 career personnel including our Chief, Deputy Chief, four Captains, two Lieutenants, eighteen Firefighter/EMT’s, and three clerical/administrative personnel. The majority of our career personnel carry the additional title of Fire Inspector and perform inspection duties on a rotating six week tour in our Fire Prevention Division…. Our volunteer staff encompasses about 130 Fire and Emergency Medical Personnel…. Our career personnel work Monday through Friday, from 7 a.m. to 6
p.m.… This blend of career and volunteer staffing offers a high quality and cost effective system for providing Emergency Services to the residents and visitors of Evesham Township (Evesham Fire-Rescue, 2001).

“The primary mission of Evesham Fire-Rescue is to provide quality fire and emergency medical services”(Evesham Fire-Rescue, 2001). Operating within that mission statement, the Fire Prevention Division is assigned the duties of public education and code enforcement which includes enforcement of both the Uniform Fire Code (UFC) which is a life safety prevention code and the Uniform Construction Code (UCC) which is for new construction or renovations of structures (LaRosa, personal communication, July 18, 2002).

Fire Marshal Tom LaRosa is interested in this research because the department has never determined if evacuation planning in multiple story office buildings has been performed and if it properly addresses special-needs individuals. LaRosa plans to develop appropriate public education information to address any deficiencies exposed by the research. The results of the research will allow the Fire Prevention Division to determine the effectiveness of evacuation plans in multiple story office buildings and will provide the necessary information to address areas determined to be deficient.

The fire department will also be able to determine if evacuation plans have been developed that incorporate any special procedures that involve the fire department that they are not currently aware of. For example, a procedure may be developed that requires wheel chair bound individuals to wait in the stairways until fire department personnel can assist them in exiting.
In addition to addressing local emergency planning issues, the research will also relate and support two of the United States Fire Administration operational objectives. First, the objective to “reduce the loss of life from fire in the age group 14 years old and before; and secondly, “reduce the loss of life from fire in the age group 65 years old and above” (National Fire Academy [NFA], Oct. 1, 2001, p. II-2). The research will achieve these objectives by identifying evacuation deficiencies in multiple story office buildings and recommending correctional changes in order to ensure safe evacuation of all ages during emergencies.

The research also relates to the National Fire Academy’s (Dec. 1998) Executive Development Course. In the unit on Ethics, it list the ethical responsibilities of employers “to provide a safe work environment” (p. SM 8-19). The research will help businesses provide a safe work environment by helping to ensure safe evacuation of employees from the workplace during an emergency.

**LITERATURE REVIEW**

Evacuation plans are important because they explain and teach occupants of a building the safest and quickest way out of a building during emergencies. Occupants of a building understand the importance of getting out of a building when an emergency occurs that threatens their safety.

The New Jersey State Uniform Fire Code/1996, which is the current adopted code, requires the development of emergency plans and the training and conducting of fire exit drills in Assembly Occupancies, Educational Occupancies, Day Care Centers, Dormitories, Residential Care (Use Group I-1), Incapacitated Care (Use Group I-2), Restrained (Use Group I-3), High Rise Buildings, Casinos, Flammable Liquid Storage
Terminals, and Use Group R-1 occupancies. It does not require multiple story office buildings to develop an evacuation plan unless it would meet the requirements of a high-rise building (p. 31). There are no buildings in Evesham Township that currently meet the requirements of a High Rise building (LaRosa). The New Jersey State Fire Prevention Code/1996 does state, “The owner or lessee of every structure shall be responsible for the safety of all person in, or occupying, such premises with respect to the adequacy of means of egress there from” (p. 27). While the owner or lessee may not be required to develop evacuation plans, they are clearly responsible to make sure people can safely exit the building.

The Evesham Township Code was checked to determine if any local ordinances were passed that require the owner or lessee of an office building to develop and practice evacuation plans. No ordinance was found that would require such evacuation plans to be developed or practiced for business buildings.

The National Fire Protection Association (NFPA, 2001) chapter on Emergency Evacuation Drills list the different occupancies where fire drills are required and the number of drills required per occupancy as described in the NFPA 101 Life Safety Code. It recommends that business occupancies are required periodic drills in buildings with more than 500 occupants or more than 100 above or below street level (p.190). Neither the State of New Jersey or Evesham Township adopted the NFPA 101 Life Safety Code as their fire prevention code, but it is a recognized national fire prevention code that could be used as a benchmark.

Later in the chapter on Emergency Evacuation Drills, NFPA discusses the requirements of the Occupational Safety and Health Administration (OSHA) standard on

A booklet entitled *How to Plan for Workplace Emergencies and Evacuations* produced by the U.S. Department of Labor (DOL, 2001.) and the Occupational Safety and Health Administration (OSHA) states “not all employers are required to establish an emergency action plan…. Even if you are not specifically required to do so, compiling an emergency action plan is a good way to protect yourself, your employees, and your business during an emergency” (p.1). The booklet contains an algorithm used to determine if the development of an emergency action plan is needed. The chart does not list the number of employees or any requirements for business buildings to confirm the statements made in the NFPA book (p.11).

In the book *Fire Inspection and Code Enforcement*, the need for specific evacuation plans for educational occupancies, hospitals, nursing homes, correctional facilities, hotels and motels is addressed (International Fire Service Training Association [IFSTA], 1987, p33). The book does not place any requirements on multiple-story business buildings, but it does state, “Fire Exit drills should be conducted in all types of occupancies. Occupants must be instructed in the correct techniques of exiting the building by more than one route” (p33).

While multiple story office buildings in New Jersey may not be required to develop evacuation plans, unless they meet the requirements of a high-rise, the literature described above strongly recommends that evacuation plans be developed to protect the
lives of both the employees and visitors. If an evacuation plan should be developed, what are the essential parts that should be included in the plan?

IFSTA describes that an evacuation plan should have three key elements. The elements that should be included are evacuation routes, monitor duties, and employee duties (p.152). Higgins (1991) also concurs with these three elements, but explains them in more detail in the Fire Protection Handbook that is listed below.

1. Evacuation routes: Each department or area must plan the route that they will use to leave the building in case of fire. Primary and secondary routes (incase the primary is blocked) must be designated. Maps should be prepared showing evacuation route, and these maps should be posted where employees and visitors can see them, the evacuation map should also list a primary and secondary accumulation point where occupants should gather to ensure that everyone has been accounted for and to pass on the information about the emergency.

2. Monitor duties: Each department should appoint a monitor to be responsible for the evacuation procedures. In addition, at least two alternate monitors should be appointed to take over these responsibilities in the event the first designated monitor is not available. The names of the monitors should be listed on the evacuation route sheets….

3. Employee duties: Duties of individual employees include ensuring that strangers in their area evacuate with them, and turning off, or shutting down, equipment that cannot be left running for an extended period of time.
Finally, the evacuation plan must include what the signal for evacuation will be, and this needs to be well communicated. Normally this information is included in the evacuation sheet posted in the department. These plans need to be practiced at least annually that is the only way to ensure that employees will know what to do if a real emergency occurs. (p. 9-31)

The DOL (2001) and OSHA have determined that it is important to consider the following when developing evacuation policy and procedures.

- Conditions under which an evacuation would be necessary;
- A clear chain of command and designation of the person in your business authorized to order an evacuation or shutdown. You may want to designate an ‘evacuation warden’ to assist others in an evacuation and to account for personnel;
- Specific evacuation procedures, including routes and exits. Post these procedures where they are easily accessible to all employees.
- Procedures for assisting people with disabilities or who do not speak English;
- Designation of what, if any, employees will continue or shut down critical operations during an evacuation. These people must be capable of recognizing when to abandon the operation and evacuate themselves; and
- A system for accounting for personnel following an evacuation (p.3).

This booklet is the first publication that was reviewed that takes into account the development of a procedure for assisting people with disabilities and others who may need assistance such as non-English speaking individuals (p.3).
Is addressing special-needs individuals a new problem? In September 1981, the *Fire Journal* published an article by Levin and Nelson that explained, “firesafety of disabled persons in public buildings is a problem of increasing importance because the number of handicapped individuals in buildings open to the general public is, in fact, increasing. Disabled persons may be found in apartments, offices, theaters, nightclubs, schools, shopping malls or any building open to the public” (p. 35). The problem was discussed again eleven years later by Dawson (1992) in his article *Emergency Planning for the Disabled*. Dawson asked the question “Are People Planning?” His answer states that “unfortunately, the evidence suggests that very few are. Public and private sector agencies that engage in emergency planning tend to use generic evacuation guidelines for the public in general and fail to recognize or meet the special needs of disabled or elderly population” (p.52). If special-needs individuals require a procedure to address their evacuation needs, what elements or parts should be included in the procedure to properly assist them? As discussed in the introduction, the special-needs individual may or may not be classified as disabled.

While DOL (2001) and OSHA recommend the development of a procedure for assisting people with disabilities and others who may need assistance such as non-English speaking individuals, they do not give a guideline or procedure that should be followed to meet this requirement (p.3).

NFPA (2001) recommends that businesses should know about any disabled occupants and their locations at all times. They recommend that an aid or “buddy” be assigned to the disabled occupant and that they should practice evacuation plans before full-scale fire drills are conducted. Special provisions should be made any time the buddy
is not available or the disabled occupant is working in the business during nonbusiness hours. Evacuation of the disabled occupant should typically be to the exterior or area of refuge (p.205).

The United States Fire Administration (USFA, 1999) developed a fire risk series that addresses the increased fire risk for four groups of the general population: Older Adults, Mobility Impaired, Deaf and Hard of Hearing, and the Blind or Visually Impaired. In the series, they list a performance-based assessment developed and recommended by the National Institute of Standards and Technology (NIST) that can be used to determine the evacuation needs of an individual. While some of the questions are designed for use in dwellings they can be modified for use in businesses. NIST recommends assessment of the following seven risk factors: “risk that the individual will resist leaving the structure”, “individual’s response to fire drills, individuals response to instructions, individual’s mobility impairments”, “need for extra help, individuals waking response to alarms”, and “probability that the individual will lose consciousness in an emergency” (p.14).

Each USFA (1999) publication explains fire safety recommendations for the periods Before the Fire, During the Fire, and Fire Prevention. Every publication recommends planning and practice escape plans, and to design these plans around the capabilities of individuals (appendix section).

In addition, USFA funded another publication developed by the National Institute of Standards and Technology (NIST, n.d.) entitled Emergency Procedures for Employees with Disabilities in Office Occupancies (p.ii). The NIST examines three steps to ensure safe egress from the building, which includes detection, notification, and movement. The
thought process for the three steps is that a fire needs to be detected before it interferes with the movement of the people, that people need to be notified so they can begin to evacuate, and that a plan for movement of the people through the building be developed (p.1).

The NIST goes on to explain that there will always be someone who needs assistance during an evacuation. Help may be required from a permanent condition such as arthritis or temporary condition such as a broken leg. They state “it is essential to identify individuals who need assistance but never lose sight to the fact that some people may not recognize their own need for help” (p.3).

The NIST makes recommendations for assistance techniques to be developed in written procedures for the following special needs: Vision Impairments, Hearing Impairments, Learning Disabilities, Mobility Impairments, Pregnancy, Respiratory Disorders and Cardiac Conditions (p. 17-20).

**Literature Review Summary**

All of the research reviewed recommends that evacuation plans should be developed even if they are not required. The elements of an evacuation plan vary by title in different references but most of them include the same essential elements. The one problem with many of the evacuation planning guides is that they do not list procedures or requirements for special-needs individuals. Most of the procedures or requirements for special-needs individuals are located in separate references developed for that specific purpose.

The information obtained from the references will be used to determine if the current developed business evacuation plans are properly designed, if they address the
requirements of special-needs individuals, and what procedures should be in place to
address special-needs individuals if nothing is developed

PROCEDURES

A literature review and a survey were conducted to develop factual information to
answer the research questions and to solve the problem statement.

The literature review began in February 2002, in the National Fire Academy’s
Learning Resource Center in Emmitsburg Maryland. The literature review was conducted
in search of information related to fire evacuation planning, emergency planning, and any
type of information related to special-needs groups such as the disabled, handicapped or
elderly. The review produced articles and information found in journals, periodicals,
reports, and books related to the subject.

The information produced was reviewed to assure that it was both current and
related to the subject. The selected information was reproduced for further analysis in the
future. All reproduced information was copied with all necessary documentation such as
author and publisher information.

An on-line search for related information regarding fire evacuation planning,
emergency planning, and any type of information related to special-needs groups such as
the disabled, handicapped, or elderly was conducted during the months of May, June, and
July 2002 at Evesham Fire-Rescue, Station 221. The on-line search produced several
articles, pamphlets, fact sheets, booklets, and books related to the subject. The sources of
the information were from both public and private organizations.

A second literature review was conducted in June 2002, at the National Fire
Academy’s Learning Resource Center in Emmitsburg, Maryland. The second literature
review was performed in search of any additional information related to fire evacuation planning, emergency planning, and any type of information related to special-needs groups. The references from several of the articles and books from the on-line search were used to conducted advance searches by authors and subjects. The information produced was reviewed to assure that it was related to the subject and current. The information was reproduced for further review in New Jersey. All reproduced information was copied with all necessary documentation such as author and publisher information.

A survey was created in an effort to produce current data related to the research questions. The survey contained nine questions and a copy is available in Appendix A. The surveys were hand delivered to businesses by firefighters and the writer. The purpose of the research instrument was explained to each business and they were asked to complete the survey at that time. The firefighters and I read the questions to the respondents. No businesses were required to complete the survey and it was explained that their responses would not result in any type of fire violation because there were no code requirements to develop an evacuation plan. The surveys were conducted over the course of one week at the end of July 2002.

The survey population was every business in the township that operated in a multiple story office building. Every business was visited and the name and address of each business was recorded even if they did not complete the survey. The total population that was contacted was 143 businesses. The total population contacted should be the total population unless businesses were skipped or missed which will be discussed in the assumptions and limitations section. The number of surveys that were completed was
119. To assure the survey has a 95 percent confidence level, the National Fire Academy (1998) recommends a sample population of 108 surveys would be required to be completed if the total population was 150 businesses. The 119 completed surveys would give a 95 percent confidence level up to a total population of 170 businesses (NFA, Dec. 1998, p. SM 3-40). Even if a few businesses were missed the sample population would be adequate to ensure the 95 percent confidence level desired.

**Assumptions and Limitations**

The assumption is that everyone who took part in the survey answered the questions truthfully. There is also the assumption that the firefighters who read the questions did so accurately and did not influence the answers. It also assumes that the firefighters and I recorded the answers from the respondents correctly.

The firefighters and their uniforms may have influenced the answers of the respondents. Firefighters in the same uniforms perform life safety inspections in each business every year and cite them for any violations discovered. It was explained to each respondent that there was no requirements in the fire code to have an evacuation plan and that their answers would not result in any type of fire code violation, but some respondents may have allowed their fear of receiving a violation influence their answers. It is also assumed that each firefighter explained that there were no code requirements to the respondents.

Having firefighters read the questions and assist in the completion of the surveys did contribute to the list of assumptions and limitations. It is believed that the large number of completed surveys was a result of the firefighters hand delivering the surveys and reading the questions to the respondents. The interaction with the respondents and the
peripheral information obtained will be clarified in the discussion section later in the paper.

Out of the 42 businesses that confirmed they had evacuation plans, only seven actually produced copies of their evacuation plans. The few copies received limited the evaluation of evacuation plans when determining if they are properly designed and address special-needs individuals.

RESULTS

The following results to the research questions where produced from a comprehensive survey and literature review. The results of the survey can be reviewed in their entirety in Appendix B.

Research Question 1. Are businesses developing evacuation plans? The survey results indicated that 35 percent of businesses have some type of evacuation plan. There were 119 businesses that completed the survey with 42 businesses stating that they have an evacuation plan for the business.

Research Question 2. Are businesses designing evacuation plans properly and addressing the evacuation of special-needs individuals? The evaluation used to answer this question is very limited because only seven businesses supplied copies of their evacuation plans.

The criteria used to determine if evacuation plans are designed properly are the three key elements discussed by both IFSTA and Higgins. Higgins (1991) describes:

1. Evacuation routes: Each department or area must plan the route that they will use to leave the building in case of fire. Primary and secondary routes (incase the primary is blocked) must be designated. Maps should be prepared showing
evacuation route, and these maps should be posted where employees and visitors can see them, the evacuation map should also list a primary and secondary accumulation point where occupants should gather to ensure that everyone has been accounted for and to pass on the information about the emergency.

2. Monitor duties: Each department should appoint a monitor to be responsible for the evacuation procedures. In addition, at least two alternate monitors should be appointed to take over these responsibilities in the event the first designated monitor is not available. The names of the monitors should be listed on the evacuation route sheets.

3. Employee duties: Duties of individual employees include ensuring that strangers in their area evacuate with them, and turning off, or shutting down, equipment that cannot be left running for an extended period of time.

Finally, the evacuation plan must include what the signal for evacuation will be, and this needs to be well communicated. Normally this information is included in the evacuation sheet posted in the department. These plans need to be practiced at least annually- that is the only way to ensure that employees will know what to do if a real emergency occurs. (p.9-31)

None of the evacuation plans supplied met all three key elements listed by IFSTA and Higgins. The answer to the first part of the question is “no”, evacuation plans are not being designed properly.

The second part, are businesses addressing the evacuation of special-needs individuals? Out of 42 businesses that stated they have a plan, 21 businesses confirmed that they developed some type of procedure in their plans to address special-needs
individuals. The 21 businesses with special-needs evacuation procedures represent 50 percent of the 42 total businesses with plans. Comparing the 21 businesses with procedures for special-needs individuals to the 119 businesses that completed the surveys, it only represents 18 percent of the businesses with special-needs evacuation procedures.

The evacuation plans supplied by the businesses were reviewed to see if they addressed special-needs individuals or disabled in any fashion. Two of the plans addressed helping people who are disabled or anyone who needs assistance. The answer to the second part of the question would be that overall very few businesses have any type of procedure to address special-needs individuals.

Research Question 3. After evacuating the building, do businesses account for employees on the exterior? The results of the survey indicate that 76 percent of the businesses that have an evacuation plan do some type of accountability upon exiting the building. Of the 42 total businesses with evacuation plans, 32 businesses perform an accountability procedure outside the building. Comparing the 32 businesses that perform accountability to the 119 businesses that completed the survey, only 27 percent of businesses account for their employees and/or visitors during an evacuation.

Research Question 4. Do businesses train their employees on evacuation procedures? Of the 42 businesses that have evacuation plans, 26 businesses stated that they train their employees on the evacuation procedure, which represents 61 percent of the businesses with evacuation plans.

Research Question 5. What procedures should be in place to properly address the evacuation requirements of special needs-individuals? The following elements that are
discussed should be incorporated into the evacuation plan to properly address the special requirements of special-needs individuals.

The procedural manual developed by the NIST (n.d.) is the most comprehensive and complete guide that could be found. They recommend a three-step process to ensure safe egress from the building, which includes detection, notification and movement. The thought process for the three steps is that the fire needs to be detected before it interferes with the movement of the people, that people need to be notified so they can begin to evacuate, and that a plan for movement of the people through the building be developed (p.1).

The NIST goes on to explain that it is essential to identify individuals who need assistance but never lose sight of the fact that some people may not recognize their own need for help. Upon identification, the individual should be consulted to assist in the development of the procedure and help in the selection of any evacuation assistance devices that may be required to assure a safe evacuation (p.3).

When consulting with a special-needs individual, the following questions listed in the USFA (1999) fire risk series should be used to determine the evacuation needs of special-needs individuals. It is recommended to assess the following seven risk factors: “risk that the individual will resist leaving the structure”, “individual’s response to fire drills”, “individuals response to instructions”, “individual’s mobility impairments, need for extra help”, “individuals response to alarms” (which was changed from individuals waking response to alarms), and “probability that the individual will lose consciousness in an emergency” (p.14).
The NIST recommends assistance techniques to be developed in written procedures for the following special-needs: Vision Impairments, Hearing Impairments, Learning Disabilities, Mobility Impairments, Pregnancy, Respiratory Disorders and Cardiac Conditions (p. 17-20). They also recommend that a buddy system and Fire Warden procedure should be incorporated into the plan to assist special-needs individuals (p.14).

In addition the NIST requires that all selected equipment and procedures should be documented in writing and incorporated into the businesses emergency evacuation plan. The plan should be reviewed and practiced (p.5).

DISCUSSION

The results of the study indicate that while all the experts and national organizations recommend that businesses develop evacuation plans even if they are not required, very few actually heed the recommendation and do so. After examining the few copies of obtained evacuation plans, it appears that very few businesses incorporate the recommended elements and/or develop any type of procedure to address the special evacuation requirements of special-needs individuals into their plans.

The results also need to be carefully examined because many businesses that stated that they have an evacuation plan did not actually produce a plan and some of the businesses that did produce plans were actually just diagrams of evacuation routes out of the building. While having evacuation routes posted is better than nothing, the posting of routes does not incorporate the necessary elements to be considered a valid plan.

The results of the study impact Evesham Fire-Rescue in a couple of different ways. First, from the fire prevention/public education standpoint it can be determined that
there is a need to help businesses design evacuation plans that incorporate the proper elements of an evacuation plan and properly address procedures for special-needs individuals.

Secondly, it impacts the fire suppression side anytime a business in a multiple story office building is evacuated. Fire officers must make sure that everyone is out of the building and accounted for anytime they respond to one of these types of buildings. Demonstrated by the results obtained from the survey, only 35 percent of the businesses have any type of evacuation plan and not all of those perform accountability procedures for employees and visitors outside the building. Less than 20 percent or one out of every five businesses have any type of procedure in place to evacuate special-needs individuals. The first arriving units may need to assist in the evacuation of special needs individuals or check each stairwell and floor lobby for individuals waiting for assistance.

As discussed in the procedures section, firefighters and I personally went to each business and completed the survey with the firefighters and myself reading the questions to the respondents. We received additional feedback that was very interesting but was not recorded by the survey. Both the firefighters and I concluded that most respondents of the survey felt that it was very important to have an evacuation plan and could see the importance in addressing the requirements of special-needs individuals. Most respondents were surprised that evacuation plans were not required by the fire code and felt that it probably should be. Many respondents commented that they have thought about developing some type of evacuation plan or were contacted by a home office to develop some type of evacuation/emergency plan since the attacks of September 11th and the anthrax scares that followed. In addition, many respondents stated that they never gave it
much thought about how special-needs individuals would evacuate or even themselves if they experienced some type of injury that limited their mobility.

Overall, most respondents thought that developing evacuation plans was an excellent idea and many requested that the department to contact them in the future to help in the development of the plans.

RECOMMENDATIONS

As stated in the introduction, the problem that needed to be addressed was that Evesham Fire-Rescue has never verified if businesses located in multiple story office buildings have developed building evacuation plans and if developed plans appropriately address the needs of all occupants, especially special-needs individuals such as the mobility impaired. Now that we have the answer, we need to address the next issue, which is how the department will assist businesses to design building evacuation plans and make sure that they are properly developed and practiced.

The following recommendations should be adopted by Evesham Fire-Rescue:

1. The department should develop a manual that explains the required procedures to properly develop an evacuation plan and include a section that addresses the requirements of special-needs individuals.

2. The department should encourage the development of evacuation plans during their annually visits to inspect each business.

3. The department should assign a public education officer to address the development of evacuation planning and other public education issues for the department.
4. The department should develop a standard operating procedure to address the
correct action to be taken to ensure the total evacuation of multiple story office
buildings, which should include anytime the fire alarm is activated.
Currently, single engine responses to alarm systems in these buildings often
results in the officer interacting with building maintenance in an attempt to locate
the reason for the alarm activation while never confirming that everyone is out of
the building or if there is anyone waiting for assistance in the stairways or lobbies.
Eventually one of the alarms will be signaling an actual fire, which will cause the
department a delay while attempting to confirm the building is evacuated and
everyone is accounted for.

5. The department should train firefighters and EMT’s regarding evacuation
equipment they may encounter for special-needs individuals, and teach carrying
and removal techniques for all types of individuals.

To any future readers, in order to determine if businesses in your community are
developing building evacuation plans and if developed plans appropriately address the
needs of all occupants, especially special-needs individuals, additional research will be
required to be performed. The reader’s community may have different ordinances and/or
code requirements that can determine the development, or lack of development of
evacuation plans and procedures. All readers are encouraged to have their department
take an active role in evacuation planning with the businesses in the community, which
will help develop good relationships and will allow the department to determine what the
businesses in the community expect of them.
REFERENCES


APPENDIX A

Survey

1. Do you have any employees that have limited mobility or who are disabled?
   Yes  No

2. Do you have a sign-in log for visitors?
   If yes, is the log used during evacuations to account for visitors?
   Yes  No

3. Do you have a written evacuation Plan?
   If no, thank you for taking the time to complete the survey.
   If yes, please continue with question 4.

   Yes  No

4. Do you train your employees on the evacuation plan?
   Yes  No

5. Does your evacuation plan contain procedures on how to handle special-needs individuals, such as the disabled?
   Yes  No

6. Do you practice your evacuation plan at least yearly?
   Yes  No

7. Does your plan address an area outside the building to meet in order to account for everyone's presence?
   Yes  No

8. Are the evacuation routes posted in the office or building?
   Yes  No

9. Can we have a copy of your plan?
   Yes  No

Business Name: ____________________________________________
Business Address: ___________________________________________
Floor Location: 1st 2nd 3rd 4th
Number of Employees: _______________
APPENDIX B

SURVEY RESULTS

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<tr>
<th>Surveys Attempted</th>
<th>Surveys Completed</th>
<th>Special-needs employees</th>
<th>Sign-in log</th>
<th>Log used for accountability</th>
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<td>119</td>
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<td>9.24%</td>
<td>31.09%</td>
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<th>Train employees</th>
<th>Special-needs procedures</th>
<th>Plan practiced yearly</th>
<th>Accountability taken outside build.</th>
<th>Evac. routes posted</th>
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<th>Special-needs employees</th>
<th>Evacuation plan</th>
<th>Special-needs procedures</th>
</tr>
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