An Assessment of a Revised Approach to Training for the Rockford Fire Department,
Rockford, Illinois
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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 National Fire Protection Association (NFPA) and the Insurance Services Office (ISO) require that firefighters maintain skills and be able to demonstrate competence on an annual basis in order to ensure their safety. The Rockford Fire Department had a problem with scheduling multi-company training and explored options to deliver quality multi-company training to firefighters. With the consistent development of new technologies, there are many options available to reduce out of service time of fire companies and occupy less calendar time. This allows for more training and other activities. The purpose is to identify alternatives to deliver multi-company training.

The research on the alternative delivery methods was conducted using the descriptive method and sought solutions to the following questions 1) How do other fire departments of similar size conduct multi-company training? 2) What are the costs associated with alternative training models? 3) What are the benefits associated with alternative training models? 4) How do personnel in our department suggest we deliver multi-company training? 5) How do other organizations in public and private sectors conduct training for personnel located at different facilities?

Following the literature review and research, the Rockford Fire Department used the information obtained to develop a program of alternative delivery for classroom portions of multi-company drills. This will minimize out-of-service time and maximize the effective use of time through the use of on-line training.
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An Assessment of a Revised Approach to Training for the Rockford Fire Department, Rockford, Illinois

The Rockford Fire Department is currently researching alternative delivery models to our current training programs. Due to increased run volume and other demands on our department members, we have found that it is very difficult to schedule training in the manner that we have historically. Our problem is the Rockford Fire Department is having trouble scheduling multi-company training.

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

a) How do other fire departments of similar size conduct multi-company training? b) What are the costs associated with alternative training models? c) What are the benefits associated with alternative training models? d) How do personnel in our department suggest we deliver multi-company training? e) How do other organizations in public and private sectors conduct training for personnel located at different facilities?

Each of these research questions will require a slightly different approach to ensure a complete understanding of the topic and to generate additional knowledge of the topic. As the needs of our department have changed and evolved over the years, so, too must the delivery methods that our training division uses. The department is exploring many options to make multi-company training as successful as possible.

The purpose of this applied research project is to determine if on-line or other distance-based learning modality has value and purpose for the Rockford Fire Department. This would be
a modification to our traditional multi-company drills that have involved classroom training followed by practical evolutions lasting a total of three hours.

Many sources have been used to conduct this applied research paper such as magazines, journals, books, on-line publications, and personal interviews. Data will also be obtained through a questionnaire distributed to other fire departments, department members, and course review questionnaires.

Background and Significance

The United States Fire Administration (USFA), has established five operational objectives 1) Reduce risk at a local level through prevention and mitigation 2) Improve local planning and preparedness 3) Improve the fire and emergency services’ capability for response to and recovery from all hazards 4) Improve the fire and emergency services professional status 5) Lead the Nation’s fire and emergency services by establishing and sustaining USFA as a dynamic organization (United States Fire Adiministration, 2010). The research and data obtained by this project will be used to reduce risk of our department by providing training for firefighters that will directly serve to reduce line of duty deaths and injury. It will also improve local planning and preparedness by increasing fire service personnel participation in the development of programs to enhance our local fire and EMS performance in response to all hazards. The third goal of improving fire and emergency services’ capability for response to and recovery from all hazards with also apply as it will serve to improve the fire and emergency services’ professional standards.

This project also directly relates to the Executive Development course with the established course goals of 1) Lead effectively and efficiently within a dynamic and complex
In order to better understand the specific challenges facing the organization, a complete understanding of the community is important. The City of Rockford is located in north central Illinois, approximately 70 miles west of Chicago and approximately 10 miles south of the Wisconsin border. According to the United States Census Bureau, Rockford is the third largest city in Illinois occupying a land area of approximately 61 square miles and having an estimated population of 152,222 (United States Census Bureau, 2013). The department has 282 firefighters, 11 fire stations, maintenance facility, training academy, and administrative headquarters. In 2012, the Rockford Fire Department responded to 24,557 calls for service. This includes 286 structure fires, 123 vehicle fires, 1,151 auto accidents and rescue calls, and 18,358 EMS calls (City of Rockford, 2013). These numbers represent a 3.5% increase in overall run volume and a continuing trend of additional calls for service year after year and the resultant increase on the demands placed on our department. The department provides these services by 9 engine companies, 1 ladder, 3 quints, 5 ambulances, technical rescue unit, hazardous materials response unit, 3 aircraft rescue and firefighting trucks, and numerous inspector and staff vehicles. The department provides a full spectrum of emergency services such as fire suppression, emergency medical services (EMS) transport, extrication, technical rescue, hazardous materials response,
and aircraft rescue and firefighting. The department also provides fire inspections, fire origin and cause investigations, public education, and many other ancillary services.

The city, as many similar communities, has also undergone significant budget challenges over the past few years. According to Greg Castronovo (2012), Administrative Division Chief for the Rockford Fire Department, we have been consistently required to produce more and more each year while seeing substantial reductions in budget allocations (Castronovo, 2012). The department has lacked a comprehensive capital budget replacement plan for approximately 10 years and has just recently explored and instituted a leasing program to replace apparatus that has been retired due to excessive maintenance costs and identified safety issues. This program has resulted in the purchase of 3 new quints, 1 new engine, and staff vehicles in 2012. In 2013, we will be accepting 4 new engines, 4 new ambulances, and additional staff vehicles.

The Rockford Fire Department conducts training in accordance with Illinois Office of the State Fire Marshal (OSFM) training objectives and the guidance established by Insurance Services Office (ISO), Illinois Department of Public Health (IDPH), and the various other mandates established by federal law. Most of this training occurs at our department’s fire training academy which is classified as an unlimited training facility by the Illinois OSFM. The training conducted at the fire academy includes training of new recruit firefighters, daily company level training, technical rescue (dive, confined space, rope, trench, and structural collapse), EMS continuing education, and various multi-company drills. This delivery of multi-company drills will be the focus of this paper and potential options to our traditional drill methods will be explored.

In order to better understand the various mandates of training, the department has established a multi-year training and exercise plan that divides the training into the following
categories: EMS, firefighting, officer development, and technical operations. All of this activity takes place under the auspicious of the training division. The training division has a division chief (who is also responsible for fire prevention due to recent budget cuts), a fire training coordinator, and an EMS training coordinator. The department also has established a fire training committee with the initial goal of conducting a needs assessment for a Federal Emergency Management (FEMA) Assistance to Firefighters Grant (AFG) for $405,000 that was provided for mobile fire training props. This committee has since evolved to provide input on drills and also to form our main instructor cadre of the department. At the disposal of the training division are also multiple instructors who generally work on the company level, but can be assigned to the academy to facilitate drill delivery. According to the Insurance Services Office, Inc., a fire department should conduct a minimum of 8 multi-company drills a year. Of these, four should be multi-company and two should be night drills (Insurance Services Office, Inc., 2012).

Another option available to the Rockford Fire Department has been the ability to broadcast training videos and PowerPoint presentations over a closed circuit television station viewable on a dedicated channel our local cable television network provides. This station is available 24 hours a day and the programming is easily changed to meet the department’s specific needs through a DVD player or computer video files that are accessible at the fire administrative headquarters building. The video training option has recently just been reintroduced to the department as a solid option for training. Within the last few years, our local cable provider rewired the entire city to create a high speed network. As part of this infrastructure improvement, a fiber optic connection was installed in our headquarters building. This type of training is easily customized and tailored to the specific needs of the personnel or the specific needs of the department. The department also has provided brief in-service training
via SharePoint, an on-line file sharing platform on computers placed in the fire stations that were purchased through utilization of a grant and specifically assigned them for training purposes.

Currently, the department hosts most multi-company drills at the fire training academy which is located at 3329 West State Street, Rockford, Illinois. This is situated on the far western edge of the city of Rockford. The Rockford Fire Department Training Academy is designated by the Illinois OSFM as an unlimited training facility, making our facility and personnel eligible to teach nearly all of the certification courses offered through the OSFM. This facility also is designated by the Illinois Environmental Protection Agency as an approved open burn site, allowing us to conduct realistic Class A burn evolutions, using primarily straw and pallets. Our facility also hosts a wide variety of specialized props such as multiple burn facilities, forcible entry props, a flashover simulator, and roof ventilation props. There are also areas designated for flammable liquids training, natural gas live burn training, automobile extrication, vehicle driving, and physical fitness. Our typical multi-company training sessions generally last 3 hours and consist of an hour to 1.5 hour classroom session followed by a hands-on practical training component. The ratio of classroom to hands-on is impacted by many variables but, is generally dependent upon the specific subject matter being taught, the skill level of the participants, and the training objectives established by the instructors and approved by the training division and the training committee. Other locations, if determined to be more suitable based on the specific type of training will be utilized. This may be a water rescue drill conducted at a river or lake, a large area search and rescue drill conducted at a vacant warehouse, a hazardous materials scenario conducted at an industrial location or an aircraft firefighting and rescue drill conducted at the airport.
This project is intended to determine if other solutions exist to more effectively deliver training to our personnel in a cost-effective and consistent manner. This is the revised approach to the more traditional training delivery that we will explore and develop further through the use of a literature review and multiple questionnaires. Specifically, investigation into the viability of on-line or video based training to conduct the didactic or classroom portion of the training will be explored.

The Rockford Fire Department is very active in many facets of training. In 2012, the Rockford Fire Department conducted 108,660.42 staff hours of training with 6,630.50 staff hours devoted specifically to multi-company drills (Russell, 2013).

Literature Review

The purpose of this literature review is to evaluate national standards and determine successes and failures experienced in alternative delivery styles of training. This information will then be used to determine the perceived effectiveness of alternative delivery styles for firefighters and other workers. This research was focused on adult learners and determination of acceptable alternatives to our current training methodologies. This research will also look at student motivations and ways to ensure understanding of the required educational topics while delivering the training in a cost effective and prompt manner. It is felt that an on-line training component to our current training program would be the most ideal scenario to explore. On-line training allows companies to remain in service and available to respond, personnel to learn at their own pace, and training to be better documented and measured to ensure compliance with the regulations.
According to FireHouse magazine (2012), multi-company drills should present realistic challenges, evaluate each individual crew member’s performance, determine team performance, determine how the crew works as part of the entire fire ground response, determine overall efficiencies and consistency, observe the team under realistic scenarios, observe the companies performing tasks in real time, test standard operating procedures (SOPs), introduce new SOPs, and build trust with mutual aid companies (FireHouse, 2012). Many training sessions are dictated by National Fire Protection Administration (NFPA), Illinois Office of the State Fire Marshal (OSFM), and Insurance Services Office (ISO) criteria. Multi-company drills are designed for firefighters to maintain proficiency in their skills and knowledge and to improve their skills and advance the profession through training and educational programs (Illinois Society of Fire Service Instructors, 2009). The NFPA Standard on Fire Department Occupational Safety and Health (NFPA 1500) recommends that departments develop the following:

1) Members shall practice assigned skill sets on a regular basis but not less than annually
2) The fire department shall provide specific training to members when written policies, practices, procedures, or guidelines are changed and/or updated
3) The fire department shall develop a recurring proficiency cycle with the goal of preventing skill degradation and potential for injury and death of members
4) The fire department shall develop and maintain a system to monitor and measure training progress and activities of its members
5) The fire department shall provide an annual skills check to verify minimum professional qualifications of its members. (Illinois Society of Fire Service Instructors, 2009, p. 1)
Since the typical way our department has conducted multi-company training historically no longer seems to be working due to the increased demands on our personnel, many other options are being considered. Training typically involves an instructor standing before a classroom and advancing through a slide show and canned program. This generally is enough to get the students to grasp the basic concepts and perhaps score a 70% on a multiple choice quiz (Buchanan & Davis, 2006). Many training officers have the feeling that they are just barely juggling all of the various aspects of training because of all the mandates, budgets, and reduction of time. This is similar to the concepts discussed in Buchanan (2006), where instructors feel that they hold basic firefighter training in one hand, officer training in the other, and multi-company training on the tip of their nose.

A major consideration on reducing demands on our personnel is to determine how technology can be leveraged. According to Morgenthaler (2012), many students welcome on-line training due to increased demands placed on them by jobs, family, and other life commitments (Morgenthaler, 2012). There are also numerous identified benefits to on-line training such as access, pace, student interaction, and support (Morgenthaler, 2012). Access to learning could be accomplished in various methods which are already in place such as our Sharepoint site, television station, or via on-line free educational sites such as Moodle, Schoology, or Blackboard or by paid commercial sites such as those by Target Safety, FETN, or Kaplan. Pace could be determined by a crew or an individual that spends as much or as little time needed to be able to demonstrate proficiency in the practical evolutions. However, a potential limiting factor in on-line training is the student interaction. Within a traditional classroom setting, the students and instructor are able to interact on a consistent basis. With on-line or other educational methods, there is a significant reduction in this type of interaction. Specific interactive tools such as
allowing the students to be able to email an instructor or peer group member is helpful, but the instant interaction and discussions that generally occur in more traditional classroom settings are difficult to duplicate. The last benefit that Morgenthaler (2012) discussed was to ensure that support mechanisms that are in place. Parallels are made to more traditional educational endeavors and the fact that on-line educational programs can be used to draw in additional resources to help the student, whether it be links to additional articles or videos. These could be additional resources and assistance that are easily accessible though the computer or human interaction. These findings are similar to the work performed by O’Malley (1999), who determined that on-line learning is perceived to have some substantial advantages over more traditional learning. The advantages were determined to be time savings, better alignment with schedules, the opportunity for students to take more classes (O'Malley, 1999). This study also identified that students reported that they didn’t necessarily learn more over traditional learning methods and also felt a reduction in interaction among other course participants. This study also looked at distance learning which was perceived to be less effective than those more traditional methods of teaching. McDonald’s approach to distance learning is to create a framework to influence and support the employees to take responsibility for their own personal development (Kalman, 2012).

One of the most inspirational and motivating speakers of the concepts of “Flipping the Classroom” is Salman Kahn. Kahn developed a concept of front loading education to ensure when students are in the classroom, they are ready to discuss and apply the concepts they have a more active and interactive learning experience. This training is highly dependent on video based training (Milian, 2012) and learning that is easily repeated and reviewed (Kahn, 2011). Kahn reports that in multiple experiments at middle schools, students and teachers both report major
advances in education over very short periods of time. Students and teachers alike reported that they actually liked the new learning style and the interaction that it allowed (Kahn, 2011). In this format, time is spent applying the new skills and allows for interaction and application of the lesson materials (Milian, 2012). For example, instead of showing slide after slide of PowerPoint to a class and only allowing a short period of time at the end of the drill for discussion, interaction, and application, the class is able to come to the drill prepared to discuss and apply the material. A similar experiment was performed for a group of firefighters at the Ohio Fire Academy (Milian, 2012). In this case, firefighters attending a train the trainer course for National Fire Protection Agency (NFPA) compliant live burn exercises were presented with all the course information ahead of time in easy-to-use on-line format. The learner was able to learn at their own pace and through multiple available formats as described by Milian. Milian (2012) also reported that the class was quickly introduced to developing live fire scenarios and safety plans as the first project of the class. Coursework was presented in a more logical manner, and was used to build on the class discussions. These discussions spilled over to afterhours’ events and during breaks (Milian, 2012). Milian said, “I began to understand how this flip may have incredible potential in emergency services” and it is easy to see the benefits of this educational model. Other benefits of this model of learning were realized by Microsoft in their development of an on-line academy (Connie, 2012). By allowing their workers to learn at their own pace in their own environment, they were able to break down the traditional classroom walls and perform the necessary education in shorter time periods with less interruption to the workforce. This is a similar approach outlined in industrial settings. On-line training can be used to augment more traditional classroom training and also free up instructors (Yadav, 2011). The on-line training component is not meant to replace instruction but, is intended to provide a solid
foundation and prerequisite knowledge and provide more time for practical evolutions (Yadav, 2011). The concept of flipping the classroom allowed students to learn at their own pace and in their own way. When the students attended class, they can instantly apply the concepts and engage in discussion based on learning and practical participation.

Other departments are taking lessons from higher education and delivering training through more traditional distance learning platforms. The three distance learning platforms are paper based, CD-ROM based, and internet based (Buchanan & Davis, 2006). Each of these types presents some options and each has distinct advantages. One of the most interesting concepts is, “If I can obtain the training objective in 30 minutes, why spend three hours? I know we’ve always done training in three hours, but is it really the best approach?” (Buchanan & Davis, 2006, p. 94). This distance learning concept and the embrace of technology is something that is also endorsed by the McDonald’s Corporation (Kalman, 2012). McDonald’s has long relied on Burger U, a traditional learning institution made of brick and mortar located in Oak Brook, Illinois. Due to the global scale of their operations, they are leveraging technology to encourage class participation and to expand teamwork (Kalman, 2012). McDonald’s Corporation has fully adopted the on-line training program which will continue to grow and develop, keeping current with new technologies and advances in on-line learning.

The Fire Department of New York (FDNY) is working on the development of training for business leaders on the importance of strong leadership good communications, and high performance teams (Pfeifer, 2012). This used a different model of education in that it is designed as an entirely hands-on approach. Business leaders were placed in stressful and dynamic situations where they were forced to make decisions with little or no information. This is similar to the work in what was researched by using tactical decision games (TDG) (Critchton, Flin, &
Rattray, 2000). Skills such as leadership ability, communication skills, situational awareness, and decision making all while under extreme pressure are all important to develop. The authors describe that, through the use of TDG, a low cost scenario that requires moderate set-up, a student can develop these necessary skills.

Other industries are also using on-line format to deliver education to its employees. Texas Engineering Extension Service (TEEX) developed an on-line course to educate students on the dangers of confined spaces, regulations, hazard control, and rescue (Yadav, 2011). This course was not designed to replace hands-on training but, instead, designed to reduce instructor time in the classroom and “provide more time in the field to practice potentially lifesaving entry, exit, and rescue procedures” (Yadav, 2011).

Benefits of on-line training or other forms of distance or blended learning are many. In the whitepaper developed by Summit Training Source, they describe that there are significant cost benefits due to travel expenses. As a fire department, we must also consider the out of service times and the added response times due to coverage of a geographical area by a more distant fire company than the one that is out of service. Other benefits include consistent curriculum, self-paced learning, easily tracked, and available when the student is available. The National Fire Academy is also embracing the changes in technology and assessing different ways to deliver education. According to Dr. Denis Onieal, “not everything can be taught on-line, and not every subject requires a 10-day classroom-based course” (Wilmoth, 2012, p. 2). Dr. Onieal goes on to say that with on-line training we have to know what we want the student to know or do, how we can measure the new knowledge learned, and determine the best method of delivery to accomplish those goals (Wilmoth, 2012). The NFA continues to expand its on-line course offerings year after year and is requiring other distance learning in most of its EFO courses.
It is also important to understand the requirements of annual continuing education requirements placed on firefighters. The National Fire Protection Administration (NFPA) 1001 Standard for Fire Fighter Professional Qualifications (2002), outlines the “general knowledge” and “general skill” requirements for the positions of firefighter I and firefighter II, but does not discuss the continuing education requirements necessary for certification maintenance. In Annex B.4, there is discussion on using job performance requirements (JPRs) for “employee evaluation/performance critiquing and employee development” so it is implied that the tasks outlined in chapters 5 and 6 are expected to be used to outline a comprehensive continuing education program. This is important information to evaluate to ensure that all personnel are trained to the appropriate level and that skills are maintained. The Illinois Office of the State Fire Marshal (OSFM) does not formally have any continuing education requirements, but in the Illinois Society of Fire Service Instructor’s Training the Training Officer Student Manual there is specific recommendations to the requirements of “required training”. The main topic of this are referenced in National Fire Protection Association (NFPA) 1500, Standard on Fire Department Occupational Safety and Health, which states that “a department should develop and maintain a training, education, and professional development program with the goal of preventing occupational deaths, injuries, and illnesses.” The goal of this program is also to maintain proficiency in their skills and continue with professional development (Illinois Society of Fire Service Instructors, 2009). There are also numerous other annual requirements such as bloodborne pathogens, respiratory protection, driver training, hazardous materials, incident command, technical rescue, hazard communication, fit testing, and personal protective equipment (Illinois Society of Fire Service Instructors, 2009).
The costs associated with on-line training are minimal, considering the expenses our department faces with overtime annually. In an attempt to answer how much we are currently spending on multi-company training overtime, it was determined that we do not have a cost center that adequately captures that data. All overtime is consolidated into one budget item and each day in 2012, we averaged over 5.5 hire backs a day. The Rockford Fire Department defines a hire back as a person working an overtime shift of 24 hours due to low staffing levels and in accordance with the minimum staffing clause in the collective bargaining agreement. This equated to an overtime expenditure of over $2 million in 2012. The cost savings of an on-line based learning platform could be significant. In a study conducted by RFG Research and presented in a White Paper by Target Safety Solutions, 87.2% of agencies saw a reduction in overtime costs, 57.6% reduction in instructor costs, and a 57.3% witnessed fuel and vehicle savings (Target Solutions, 2012). According to Goodwin (2010), EMS managers that have incorporated on-line training have said it has substantially reduced costs. More than 50% of the respondents to a survey conducted by the RFG Research, the same firm involved in Target Safety’s White Paper, stated that on-line training has reduced instructor costs and fuel charges (Goodwin, 2010). Even a larger success was identified by 86% of respondents who said the true benefit of on-line training was the flexibility in completing the assignments (Goodwin, 2010).

There are definitely risks associated with on-line training. Buchanan (2006) compares distance education programs in the fire service to nuclear weapons; both are powerful tools, but in the wrong hands, they can cause great harm and destruction. When the Edmonton, Canada Fire Department transitioned to an on-line training module, they realized that the firefighters were concerned that the on-line training would replace practical evolutions (Whybrow, 2011). They developed a committee to help other firefighters use the program. This committee was
tasked with familiarizing the staff with the new program. They also developed a program of key resources including a simulation allowing the members to learn and critique a past fire incident and a hazardous materials response (Whybrow, 2011). The last step the Edmonton Fire Department did to ensure a successful program was to introduce pre-course materials into the fire stations. An example provided was that the staff was reviewing pre-course materials for a CPR class when a call came in for cardiac arrest. In this typical similar scenario in Rockford, our personnel would be out of service at an off-site facility and unable to respond. In the same scenario in Edmonton, personnel quickly responded and used the just reviewed skills to make a difference in a citizen’s life (Whybrow, 2011). The ability to conduct training while remaining in service is probably the largest benefit of on-line training. Other benefits are that it is very cost effective, allows for access at all hours, can be delivered anywhere there is an internet connection and a computer, is interactive, self-paced, maintains records and records usage, and is consistent in the delivery so everyone receives the same information (Summit Training Source, Inc., 2010).

According to Forest Reeder, “Don’t do training just to be compliant and don’t do training to be popular…Train your members because it is the right thing to do!” (Illinois Society of Fire Service Instructors, 2009).

Procedures

The purpose of the research conducted for this is to identify how departments of similar size to the Rockford Fire Department are performing multi-company drills, identify the costs associated with alternative training methods, identify the benefits associated with alternative
delivery methods, assess how personnel in our department feel we should deliver training, and
determine how other businesses and industry perform training.

Research for this project began at the Learning Research Center (LRC) at the National Fire Academy (NFA) in Maryland. The library and associated staff were of great assistance in understanding the variety of reference sources available and the best ways to accurately obtain the data. The staff at the Illinois Fire Service Institute (IFSI) Library was also key to the research process. The staff at IFSI Library was able to assist greatly in obtaining research sources and provide additional information to ensure that the research questions were completely answered and the results were able to provide the necessary results.

In order to accomplish this research, the descriptive method was used. In accordance with the research practicum put forth in the Executive Development course (Federal Emergency Management Agency, 2011) a sample is necessary. A sample size of 25 departments was selected and questionnaires were distributed to 10 Illinois Fire Departments and also nationwide through an email list service specifically available to other peers involved in the National Fire Academy’s Executive Fire Officer Program (EFOP). Appendix A contains a copy of this document. This document was constructed using Google Docs and all the data inputted by the respondents is automatically added into a spreadsheet with the results as they were completed. In order to answer the research question that asked specifically about our personnel’s suggestions to training delivery, Captains and Chief Officers were asked about our training program. This was also accomplished through the use of a questionnaire handed out and collected at a scheduled Captain’s Meeting. This document appears in Appendix B. In an effort to order to gain more data and to better gauge our personnel’s attitude and feelings to alternative training mechanisms, a trial drill was conducted that allowed for slightly different perspective on training utilizing our
new flashover chamber. In this drill, we had been showing training videos using our television channel and then on the drill days, we conducted quick classroom training and then focused on the hands-on practical training. This class format lasted less than one hour. Following this class, we conducted a post training evaluation allowing the students to provide feedback.

The first questionnaire that was sent to other departments resulted in only twelve respondents. This was determined to be an inadequate sample size to determine 95% confidence level based on the procedures outlined in the EFOP Self-Study Course Guide (Federal Emergency Management Agency, 2011); it was however, determined that the data obtained and the limited options for answers available to respondents allowed one to obtain a representative sample of how the fire service is conducting training. The main focus of the survey was to identify if classroom or didactic training was conducted in a classroom setting, on-line, or by another distance learning model. Some follow-up was conducted in order to completely fill out the questionnaire. The second research tool, the questionnaire to the department personnel was submitted to the Captains and Chief Officers at a normally scheduled Captain’s meeting. In order to ensure completion of the questionnaire, a brief introduction was provided and a description of the project was conducted to the group. The last research tool was a post course evaluation. This was made available to all course participants to provide feedback on the flashover training in a modified delivery format. This tool was described in a “hot wash” debriefing following the training and was completed on-line through the use of our Department’s SharePoint site.

Results

Following the various research methods conducted, similar results were obtained. Most departments are conducting multi-company in a similar way as the “traditional” style that the
Rockford Fire Department is currently conducting. The research and literature review were also able to determine many alternatives that merit further exploration.

A total of three different survey tools were used to determine how best to move forward with this project. The questionnaire that was distributed to other agencies asked a myriad of questions to first determine the department make-up to see if it was similar as outlined in the procedures section. A department’s staffing level, approximate annual run volume, and staffed apparatus were all asked. The questionnaire also asked how the department schedules multi-company drills and if companies are out of service for these drills. The questions that we had difficulty answering- what is your annual training budget and what percentage of your training budget are allocated to multi-company drills- apparently was difficult for everyone else, also. We received no responses on those questions. The questionnaire also asked about drill format and how the classroom or didactic portions were presented and if post-drill evaluations were completed. The last questions were to provide information on the challenges to deliver quality training and provide any other information the respondent felt would be helpful to the project.

The first research question was: How do other departments of similar size conduct multi-company training? The research and literature review noted that most departments conduct a drill one to three hours in length consisting of classroom learning and then practical evolutions. This type of training is consistent with ISO requirements and those established by the NFPA. Training conducted in this manner seemed to provide training that met the needs of the department and also complied with the guidance established by the various governmental agencies that establish such mandates. One respondent noted that their biggest challenge was to change the past history of how training is delivered, an interesting concept as it is the main reason for the project. Most departments exhibited similar challenges to delivering training such as staffing issues, call
interruptions, and other logistical challenges. It is also important to understand how these drills are scheduled. Of the questions asked, approximately 42% of the respondents reported that the company officers and training officers work together to schedule the multi-company drills; 42% reported that the training officers scheduled them; and 17% reported that company officers alone planned the drills. 83% of the departments reported that their companies are out of service or may only be available for certain types of calls. The format was reported to be classroom and practical skills by 83% of the departments. The didactic portion of the class is conducted by predominately lecture format (58%) and lengths are varied with 50% reporting drills from 2-3 hours, 33% 1-2 hours, and 1 reported their drills are less than an hour, and 1 reported over 3 hours.

The second research question posed the question of the costs associated with alternative training methods. As part of this question, the intent was to determine the potential savings that could be realized through alternative training delivery. These true drills costs were difficult to account for as we do not have an accounting mechanism in place to account for fuel, maintenance, and personnel costs specifically assigned to multi-company training drills as discovered in an interview with the Division Chief of Fire Administration, Greg Castronovo. We will work on a solution to ensure accurate accounting for all these types of activities in the future. We were able to identify a potential for significant savings by minimizing idling vehicle time when the personnel are training at the fire academy. We also realize that personnel costs can be minimized by our personnel completing a majority of training on duty while also being able to accomplish other tasks. For a typical drill, we require 12-13 days to complete a full rotation of our personnel through training. The instructors teach two classes a day, one at 0900 hrs and one at 1330 hrs. Generally, we have four instructors, on average, to ensure proper student/instructor
ratios. This equates to approximately $14,500 in overtime for the instructors alone. If the drill could be reduced to encompass a short classroom session and then primarily practical evolutions, the drill could be reduced to 2 hours in length. This could mean that 3 drills would be conducted a day, reducing the time needed to conduct a drill to only 8 days. Assuming the instructor cadre remains the same, this reduction of one hour alone would result in a savings of over $4,000. Another major benefit that was realized is that by reducing the length that personnel and equipment are out of service for a multi-company drill, our coverage of the city by our department is reduced for a shorter period of time. During our multi-company drills, companies from throughout the city are taken out of service to complete the training. These companies are scheduled to minimize any service coverage but, still results in companies being out of service for extended periods of time. By conducting the training on-line and then just attending the academy for the practical portion of the drill means quicker turnaround and the potential to schedule more companies each day. This allows for more ancillary tasks to be completed throughout the week whether it is pre-plans, public education, or additional training events. We should expect to realize savings similar to the data presented by Target Safety Solutions, in which departments noted an 87.2% reduction in overtime costs, 57.6% reduction in instructor costs, and a 57.3% savings in fuel and vehicle costs (Target Solutions, 2012). We also have to consider that the estimated cost of $100 per firefighter (Kaplan Solutions, 2012) which totals approximately $28,000 a year for this type of service. Similar training could be obtained at a much reduced cost by utilizing free educational services such as Moodle or Schoology and the existing television channel.

The third research question was: What are the benefits associated with alternative training models? Numerous benefits can be realized by conducting the traditional classroom training on-
line and providing different educational options to our staff. The largest benefit is that our fire
and EMS companies would be able to complete the required and mandated training and remain
in service in their assigned still territories.

Our personnel would be able to learn at their own pace and solicit assistance from other
crew members and full cadres of instructors in case clarification of any issue was needed or
additional resources were required. Other benefits could be realized by reduced idle time of
apparatus, reduction in personnel costs, and a reduction in overtime paid to instructors for
teaching the drills.

The fourth question asked how our department members suggest we deliver multi-
company training. This was completed through a questionnaire made available to our personnel
and distributed to Captains and Chief Officers. This questionnaire asked specifically about the
concepts of flipping the classroom and the various concepts of alternative course delivery. The
possible answers were Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree, and Don’t
Know. Some questions also allowed for short answer and there was adequate room for additional
comments, as required. The first question asked “most of the classroom training we do, our
company could cover before the class, allowing for more time to be spent on practical skills and
reducing out of service time” resulted in 50% stating that they agree or strongly agree. 21%
disagreed with the statement, and 28% were neutral. 71% stated that the entire crew would
participate as a group if the training was delivered on-line or via our television channel, 7%
disagreed, meaning they would not participate as a group, and 21% stated they were neutral on
the subject.

A few questions were also posed to determine the experience level of our staff with the
various existing on-line courses. Of the respondents, only 57% had taken an on-line course. In
informal follow-up conversations, most of these courses were required entry level NIMS courses which were required by our department approximately five years ago. This provided us the understanding that our department does not have a firm grasp on on-line training potential and the prospective benefits to our department.

Question 5 asked: How do other organizations in public and private sectors conduct training for personnel located in different facilities? Clearly, technology has been embraced by the private sector in all fields of education. Each year, more and more students take college level courses on-line and more courses are offered in this format. The National Fire Academy has also endorsed on-line education and many businesses such as McDonald’s and many other large corporations manage training very effectively on-line.

While conducting the research for this project, an opportunity to conduct additional research and provide an experimental course offering was conducted. Following an experimental course layout for flashover training, as detailed in the procedures section of this project, we had a total of 15 people respond to an on-line post course evaluation on our SharePoint site. Questions such as station assignment, quality of the presentation, adequacy of the content, adequacy of the materials, adequacy of the facilities, length of program, overall rating, and a few short answer questions such as what was of most value, what was of least value, what additional training would you suggest, and any additional comments. 67% of the respondents felt this course was excellent, 80% felt the adequacy of content was excellent, 73% felt the materials were excellent, 80% felt the facilities were excellent, and 87% gave the program an excellent rating in terms of length, and a total of 87% rated the course as excellent. This course received ratings of 100% in all the categories asked above the satisfactory level. This course was prefaced by providing a train-the-trainer course for the training committee which allowed them to share their experiences
in their respective stations well in advance of the drill. The committee members sharing their experiences seemed to generate excitement and anticipation for the drill. This drill also featured video learning on the television station in the form of training videos. Once the firefighters arrived at our academy, they were provided a quick briefing and skills review. From there they immediately donned appropriate personal protective equipment and completed a full safety check. The students entered the flashover chamber and instructors led the learning experience. This training was followed up with a quick hot wash and discussion on completing the on-line course completion questionnaire. This was the first time our department has attempted an alternative delivery method to deliver multi-company training.

Discussion

The literature review and the surveys revealed similar data and point to a potential opportunity to conduct a shift in the training methodologies of the Rockford Fire Department. Our department data shows that our call volume is up significantly and the demands for service of the department in both its emergency and non-emergency roles are high. Modifying the training to account for advances in technology and provide more modern educational delivery methods may be overdue. In business and industry, we have seen a huge paradigm shift from traditional classroom learning of on-line or distance delivery styles such as those described by the McDonalds Corporation (Kalman, 2012). One also cannot help to notice that student’s perceptions to knowledge acquired from distance learning is equal to or greater than that of more traditional classroom participation (O'Malley, 1999) (Summit Training Source, Inc., 2010).

The results of the various questionnaires distributed revealed that there may be some resistance to changing or modifying the training program but, with the reduction of available time, there may be few options. It has been determined in numerous studies that student’s
perception of on-line learning can be positive (Seok, 2010) and that we have to look outside of
the fire service to inspire inspiration and further development of our training programs (Milian,
2012). The future of education appears to be on-line based. In statistics cited by Morgenthaler
(2012), a reported 20% of all undergraduates have taken at least one distance education course
and an estimated 22 million college students will take an on-line course in the next five years
(Morgenthaler, 2012). Institutions of higher learning have benefited from technology and the
student’s desire for more flexible educational offerings (O'Malley, 1999). The on-line component
must have a module to allow for student and instructor interaction (Snodgrass, 2011). We have to
understand that attitudes may be hard to overcome but, on-line education can save money and
overcome the scheduling challenges and the increased demands of mandated training (Whybrow,
2011).

In order to fully realize the financial benefits to on-line training, we will also have to
provide a mechanism to track costs and account for the modifications that are made to the
program.

Recommendations

Based on the feedback obtained through various questionnaires and a review of literature
related to the topic of multi-company training, it is recommended that the current means of
delivering training be modified. The traditional means of delivering multi-company training
takes a considerable amount of resources in instructor overtime pay, company out of service
time, personnel costs, fuel costs, and other maintenance costs. If training evolutions could be
reduced to just require companies to be out of service for the practical portion, we would
potentially see measureable cost savings but, more importantly reduced out of service times. The
recommendation is that the focus of the drills moving forward should be only skills based and be largely devoted to practical/hands-on learning. The didactic or prerequisite knowledge will be obtained through a combination of on-line learning, video based presentations, and a short review and safety briefing prior to the hands-on activities.

Attitudes that have surfaced such as those that say, “we don’t fight fires with computers” are absolutely correct. With our career, there has to be a practical component (Whybrow, 2011). Practical evolutions will continue to form the backbone of our training and will actually be reinforced in quality and quantity through the use of technology. It has been shown that students can actually be better primed to learn if provided the material ahead of time and have time to prepare for the practical evolutions. Videos and short on-line learning will be slowly blended and experimented with to find solutions to our decreased budgets and time allotments. The on-line or video component will be designed to entertain, excite, and generate interest in the lesson being discussed. The material will be presented in many different ways and formats to ensure it is appealing to all learning styles and available at all times. Prior to all multi-company training evolutions, there will be a short classroom review that will include a safety briefing followed by the practical evolutions.

The various mechanisms are in place to institute a modified form of this program immediately and we will begin with a test class to evaluate the effectiveness of the program. The department is also moving forward with development of a recommendation to City Council to consider the purchase of an on-line training provider portal to accomplish EMS and fire continuing education. This on-line portal will allow the department to expand our programs even further by conducting the required annual training such as blood borne pathogens, lock out/tag out, hazard communications, and other training on regularly scheduled intervals. The department
will also begin on-line learning by requiring our department members to take additional National Incident Management (NIMS) courses on-line.

Based on our survey results, we understand that on-line training may not the most effective delivery method to all students and we will develop a mechanism to evaluate the training program’s effectiveness in the future and ensure alternates are available to provide the most effective training medium. This training transformation will be a work in progress and through the efforts and insight of the fire department’s Training Committee, it will be sure to provide an effective solution to our current training issues. We will also work to establish a specific cost center to track costs associated with multi-company drills in the future. This will allow our department to better account for expenses and to measure the successes of a modified training delivery model.

This information obtained through this research project will be used to shape the future direction of training for the Rockford Fire Department.
References


Appendix A

Outside Department Questionnaire

The following questions were posed to training officers of other fire departments that are of similar size to the Rockford Fire Department. All questions are to be answered in short answer format.

1. How many members does your department have?
2. How many companies are staffed each day?
3. What is your department's run volume?
4. How does your department schedule multi-company drills?
5. Are companies out of service when attending drills?
6. What is your annual training budget?
7. What percentage of your training budget is allocated for multi-company drills?
8. What is the format for your multi-company drill?
9. How is the didactic or classroom information presented?
10. How are post-drill evaluations completed by personnel?
11. How long are your multi-company drills?
12. What is the biggest challenge you face regarding scheduling multi-company drills?
13. Please provide any additional information that you feel would be helpful?
Appendix B

Rockford Fire Department Chief Officer and Captain Questionnaire

Flipping the Classroom

The following questions were posed to chief officers and captains of the Rockford Fire Department. All questions were to be answered using a quality rating of strongly agree, agree, neutral, disagree, strongly disagree, and don’t know.

Additional Space was also provided for any comments.

1. Most of the classroom training we do, our company could cover before the class, allowing for more time to be spent on practical skills and reducing out of service time.
2. If a drill was delivered on-line or by our television station, our company would participate as a group.
3. What would you need to participate in this type of training and ensure your crew is prepared for the hands-on portion of the drill? (short answer)
4. Do you know what on-line courses are available?
5. Have you ever taken an on-line course?
6. If you have ever taken an on-line course, did you find it beneficial?
Appendix C

Post Course Questionnaire

The following questions were posed to course participants following flashover training at the Rockford Fire Department Training Academy. Questions were to be answered by rating excellent, above average, satisfactory, below average, poor. Additional comments were solicited.

1. Your Station assignment (Answer was to pick one Station 1 through Station 11)
2. Quality of the presentation
3. Adequacy of content
4. Adequacy of materials
5. Adequacy of facilities
6. Length of program
7. Overall rating
8. What was of most value to you? (short answer)
9. What was of least value to you? (short answer)
10. What additional training drills or exercises would you be interested in? (short answer)
11. Additional comments (short answer)