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A Life Safety Initiative: Promoting Fire Safety in Collegiate Off-Campus Housing

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**CERTIFICATION STATEMENT**

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

Signed: \_\_\_\_\_

## Abstract

According to the United States Department of Education, nearly 18,000,000 college students were enrolled in America's 4,100 colleges and universities in academic year 2010. In Iowa City, the University of Iowa experienced record enrollment in 2010 with 30,825 full-time students. The majority of students live in off-campus housing.

The problem was that the Iowa City Fire Department responds to a significant number of fire-related emergencies that occur in off-campus collegiate housing. The purpose of this research was to determine methodologies that the ICFD may use to reduce the risk of death, injury and property loss due to fire among college students residing in off-campus collegiate housing.

Research questions asked were: (a) what are the industry, state and local standards for fire prevention in off-campus collegiate housing, (b) what have other fire service organizations done to enhance fire safety among college students living in off-campus housing, and (c) what methods should the Iowa City Fire Department utilize to reduce the risk among University of Iowa students living in off-campus housing?

Descriptive research was conducted. Results of the literature review revealed national and state-recognized standards for fire prevention, while the literature review and interviews with 3 experts identified municipal prevention standards, best risk-reduction practices of other organizations, and specific initiatives to be used by the ICFD.

Recommendations included (a) increase and implement requirements of residential fire protection engineering, (b) adopt new initiatives for code enforcement, and (c) form a fire safety education partnership with the University of Iowa.

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## Introduction

Tragedy struck on January 30, 2010, in Gunnison, Colorado, the home of Western State College of Colorado. In the early morning hours, firefighters responded to a 911 call and found the front porch and living room of a historic home fully involved with flames. As the fire intensified and extended up the interior staircase, team after team of firefighters were repelled by violent conditions that could not be brought under control. The result of the fire is sobering: while 4 people escaped the fire, Western State College students Lucy Causley, 19 and Adam Lockhard, 21, lost their lives. While the home had two smoke detectors, the one upstairs, nearest the sleeping rooms, did not have a battery and failed to operate (Dickey, 2010).

Sadly, every year this scenario occurs repeatedly in the United States. Data related to collegiate fire fatalities has only been collected and analyzed since 2000; from that time to present it is reported that 143 college students have lost their lives in fires (Campus Firewatch, 2010). Further, data indicates that 85 percent of these fatal fires occur in off-campus collegiate housing (2010).

While the number of deaths is sobering, fire service leaders should hardly be surprised at where the incidents occur. It can be stated anecdotally that the disparity in fire-related safety between on-campus and off-campus housing is significant. For the most part, residence halls and dormitories on college and university campuses possess some degree of fire-safe engineering. Adherence to fire codes, frequent inspections, policies that regulate behavior, automatic fire sprinklers, and monitored alarm systems are far more likely to be found in on-campus housing facilities than in those off-campus.

An analysis of pertinent data reveals that common factors may be observed in fires that claim the lives of college students. Since January of 2000, more than 80 percent of fatal fires

have occurred in off-campus housing such as home and apartment rentals, the occupancies lacked fire sprinklers, smoke alarms were either missing or disabled, and careless disposal of smoking materials and alcohol-related impairment were factors (The People's Burn Foundation of Indiana and Campus Firewatch, 2007, p. 3).

It can be assumed that parents who send their children to colleges and universities harbor an expectation that their children will be afforded a safe environment within which to build the foundation of the rest of their lives. This is unfortunately not always the case, as defined by the three bright and promising young students who have been claimed by fire in the first month of 2011 alone (Campus Firewatch, 2010). Tragically, all three lost their lives in fires that occurred in off-campus collegiate housing.

The reality exists that these students, while away from home for the first time, become functional adults for the first time in their short lives. The vast majorities of these college students either immediately or eventually stake their new lives in off-campus housing and are not adequately educated to make well-informed judgments and create sound habits related to fire safety. When considering the chain of events that must take place for a damaging fire to occur, it seems evident that being ill-informed can lead to consequences that include property loss, homelessness, and financial hardship. Tragically, it can too often lead to death.

The problem is that the Iowa City Fire Department responds to a significant number of fires that occur in off-campus collegiate housing. The purpose of this applied research project is to determine methodologies that the ICFD may use to reduce the risk of death, injury and property loss due to fire among college students residing in off-campus collegiate housing. The descriptive method of research was used to answer the following research questions: (a) what are the industry, state and local standards for fire prevention in off-campus collegiate housing, (b)

what have other fire service organizations done to enhance fire safety among college students living in off-campus housing, and (c) what methods should the Iowa City Fire Department utilize to reduce the risk among University of Iowa students living in off-campus housing?

### Background and Significance

The City of Iowa City is located in the southeastern part of Iowa, approximately 115 miles east of Des Moines and 220 miles west of Chicago. A population of 68,000 resides within the city's 30 square miles. Iowa City is comprised of a mix of residential, commercial, and both medium and heavy industrial occupancies. Iowa City is home to a Big Ten University, the University of Iowa, which increases the city's population by about 35,000 during the academic year. Iowa City is also home to the world's largest teaching hospital, the University of Iowa Hospitals and Clinics, as well as Proctor and Gamble, Oral B, and ACT, which develops and administers standardized testing solutions. The City of Iowa City is divided by the Iowa River and bordered by Interstate 80.

The Iowa City Fire Department is the oldest fire department in the state. Its roots go back to 1842, four years before Iowa's statehood, when the Legislative Assembly of the Territory of Iowa issued Council File 109, which authorized the formation of the Iowa City Fire Engine Company, largely for the protection of the new territorial (and later State of Iowa) capitol building (Brown, 1993).

For the next 70 years, Iowa City would see the formation of several autonomous volunteer fire companies, generally funded by and named for a local benefactor. On October 12, 1912, the Iowa City Fire Department was formally established as a paid full-time fire department. The Iowa City Fire Department has maintained that status since and currently serves

the city from three fire stations. Emergency and preventive services are provided by 58 uniformed personnel, including 36 Firefighters, nine Lieutenants, three Captains, and three Battalion Chiefs. Administrative functions are performed by one Training Officer holding the rank of Lieutenant, one full-time Inspector holding the rank of Captain, one Fire Marshal, one Deputy Chief, and one Chief Officer.

Considerable department resources have been committed to improving the functional responsiveness of the organization. In 1997, the Iowa City Fire Department began a three-phase organizational planning process. Phase One included faculty from the University of Iowa's Tippie School of Business assisting department members in the formulation of a mission statement, a statement of core values, and a statement of organizational vision and values. Phase Two was comprised of department leadership embarking on the Commission for Fire Accreditation International self-assessment, which further led to the ICFD's pursuit of Accredited Department status. Phase Three focused on the design of a comprehensive strategic plan for the ICFD. In 2002, the Iowa City City Council formally accepted the *Iowa City Fire Department Strategic Plan*, endorsing the goals and objectives detailed in the ten-year plan. The Iowa City Fire Department fulfilled the chief goal of the vision statement when the Commission on Fire Accreditation International conveyed an *Accredited Agency* designation in August 2008. In the spring of 2010, the ICFD joined forces with the Center for Public Safety Excellence to form and implement a new five-year strategic plan. As part of the strategic planning process, the ICFD engaged all personnel in developing a new mission statement, which is *the mission of the Iowa City Fire Department is to protect our community by providing progressive, high-quality emergency and preventive services.*

In the fall of 2010, the United States Department of Education estimates that 19.6 million people packed their bags and headed off to colleges and universities (U. S. Department of Education [U. S. DOE], 2010). There never before have been so many college students in the United States. In accordance with the nationwide trend, 2010 enrollment at the University of Iowa in Iowa City shattered all previous enrollment records, registering 30,825 full-time students (University of Iowa, 2010).

These increasing numbers are significant because they represent a growing number of young people who are leaving the relative safety of home for a new and uncertain future. Some college students will, at least for a short time, live in the relative safety of monitored, sprinklered residence halls that have been engineered for fire safety. The majority, however, will either immediately or ultimately establish their residence in off-campus collegiate housing. Not unlike most colleges and universities, the University of Iowa does not have adequate facilities to house all students. In 2011, the University's Office of Student Life reports that they are operating at full capacity, which is 5,800 beds, and that they will be unlikely to keep up with demand generated by the growing enrollment projections for coming years (K. Fitzgerald, personal communication, February 15, 2011). It seems more likely, then, that this growing number of students will be increasingly likely to make their homes in off-campus residences.

The problem is that the ICFD responds to a significant amount of fires and fire-related incidents in off-campus collegiate housing. Off-campus housing is considered to be one-and two-family homes, apartment buildings, manufactured housing, and single-family homes that have been retro-fitted into rental units. Members of the Iowa City Fire Department can proudly say that there have been no fire-related deaths, civilian or firefighter, for more than 12 years. It is

common knowledge among department members, however, that there have been a considerable number of close-calls.

Iowa City is a college town, and like comparable Midwestern collegiate cities has a diverse mix of housing options. Tens of thousands of units exist in Iowa City that are routinely rented to college students. The level of engineering for fire safety varies widely, from newer buildings protected by automated fire sprinkler systems, hard-wired smoke detectors, and monitored alarm systems, to balloon frame houses more than a century in age and heavily modified from the original use to rental units. Most of the latter, sadly, are generally only protected by a battery-operated smoke detector. While the Iowa City Fire Department data collection systems do not currently allow for specific and reliable data recall related to events that involve students living in off-campus housing, it must be realized that disparate levels of fire-safety engineering, coupled with a broad array among students of personal responsibility, education, and lifestyle choices, defines a lack of fire-safety continuity in the community that has the potential to lead to disaster.

Directly related to the problem of off-campus fire safety in Iowa City are two points of significance: the operational objectives of the United States Fire Administration (USFA) and the goals of the USFA's National Fire Academy Executive Fire Officer Program (NFA EFOP).

This research paper is related to the USFA operational objectives. The first three objectives specifically address the commitment of the USFA to reduce the loss of life in the demographic aged 14 years and younger, the demographic aged 65 years and older and the group that is comprised of firefighters, respectively. The fifth operational objective defines the USFA's commitment to toward responding to emerging issues (United States Fire Administration [USFA], 2001). By answering the research questions formulated as part of this project, the

author contends that the ICFD will be positioned to consider a strategy to address the emerging issue of fire-safety in off-campus collegiate housing. Further, the research will show that the problem of fire fatalities involving college students living in off-campus housing mirrors the national problem of fatalities occurring in residential occupancies. The author will contend that any action, particularly related to education of a populous and relatively youthful demographic may eventually have a positive impact on fire fatalities in all USFA risk groups.

This research paper meets the course goal of the Executive Fire Officer Program's (EFOP) Executive Analysis of Community Risk Reduction related to developing leaders in comprehensive multi-hazard community risk reduction, researching best practices within the fire service, and preparing to respond to all hazards in an effort to reduce severity of potential threats and emergencies within the community.

### Literature Review

The literature review for this Applied Research Project (ARP) was initially undertaken by the author at the National Fire Academy's Learning Resource Center (NFA LRC) in Emmitsburg, Maryland. The author surveyed an extensive number of periodicals, trade journals, audio-visual media, and other publications relevant to the research topic. Upon the author's return from that NFA, research was continued by examining resources on file at the University of Iowa Main Library, the Iowa City Public Library, and the Iowa City Fire Department's library of training resources. Those resources included textbooks, journal articles, fire-service trade magazine articles, reports, PowerPoint presentations, and Executive Fire Officer Applied Research Projects. Further research was conducted via the internet, as well as personal

communications and formal interviews with both fire service leaders and University of Iowa officials.

Fire service leaders at all levels of government are challenged by the fact that the United States has a considerable civilian fire fatality problem. In 2009, the United States experienced 1,348,500 fires, which resulted in 3,010 civilian fire deaths (Ahrens, 2010). These statistics represent 59 percent decreases in each category when compared with the first data set, collected in 1977. While that might seem like good news, the reality remains that fire deaths remain far too high for a country that has invested so much in fire protection advances.

Data compilation related to U. S. fire deaths paints a sobering picture. Ahrens states that in 2009, 78% of all structure fires occurred in residential properties (2010). Of the 3,010 people who lost their lives in fires during that year, 85% of them died where they lived – in single-family and two-family homes, apartment buildings, and manufactured housing (p. 3).

Analysis of data also indicates that, while the United States has ready access to the world's most advanced and proliferate fire protection and detection systems, many people are dying without the protection that those systems provide. During the years 2003-2006, nearly 12,000 people lost their lives as a result of fire (National Fire Protection Association [NFPA], 2010, table 1). Of those 12,000 people, Ahrens (2009) reports that 40% lost their lives in home fires where no smoke detector was present, and another 23% lost their lives in homes where a smoke detector was present, but was disabled – most commonly because the battery had been removed and not replaced, or because the battery was dead.

These statistics reflect some of the major concerns of the fire problem that happens in the world in which we live. In that world, according to Kiurski, the parents of millions of American college students prepare the details to help their children transition from the relative safety of

home to a new and strange setting as one of the nation's nearly twenty million college students (2007). He further contends that all too-often, those parents and prospective students become so busy that they may overlook the consideration of fire safety when securing housing.

Any literature review related to the topic of fire-safety in off-campus collegiate housing – and anyone hoping to truly reduce the risks associated with these fires – must first start with defining the gravity of the problem.

Ed Comeau is a former chief investigator for the National Fire Protection Association, founder of the Center for Campus Fire Safety, and the publisher of Campus Firewatch, an organization that since 2000 has been a national watchdog helping to define the problem of collegiate fire safety. Campus Firewatch is both a repository and publisher of data, statistics, and public education information related to campus and off-campus fire-safety, and is responsible for promoting legislation that helps to create recognition of the collegiate fire problem, and provide resources to reduce the associated risk (Comeau, 2009).

Campus Firewatch provides many resources that help to draw an important correlate between the U. S. problem and the collegiate fire problem. An accumulated data set that reflects the seriousness of collegiate fire fatalities has only been kept since 2000, when Comeau began the efforts. Between that time and the writing of this ARP, it is reported that at least 143 college students have lost their lives in fires (Campus Firewatch, 2010). The consideration of this problem as a nationwide risk-reduction priority is still in relative infancy, as experts have only begun to translate data revelations into intervention strategies since Comeau began data collection. Even after more than a decade of focus on the problem, statistics reveal that the problem is not getting better. An average of 13 students have died in fires during each academic year since partial data collection began in 2000, and the academic years 2006-2007 and 2007-

2008 registered the highest student fatality numbers, with 20 and 18 fatalities recorded respectively (Campus Firewatch, 2010, table 3). While the two complete academic years since have yielded a smaller fatality total, with 6 in 2008-2009 and 5 in 2009-2010, the current academic session saw three deaths in its first month, possibly putting 2010-2011 on pace to yield a much higher number of young students killed by fire (table 3).

Knisely (2010) reports that 66% of the nation's nearly 20 million college students live in off-campus housing. At the University of Iowa in Iowa City, only 5,800 members of a record enrollment of 30,825 live on campus (K. Fitzgerald, personal interview, February 15, 2011), meaning that the number of students living off-campus is much higher, at nearly 82%.

Campus Firewatch (2010) reports that, of the 143 collegiate fire-fatalities recorded in the past decade, 85% or 121 fatalities have occurred in off-campus housing, while 7% or 10 fatalities have occurred in residence halls and fraternity / sorority housing, respectively. The percentage of collegiate fire fatalities that occurred in off-campus houses and apartments mirrors precisely the national percentage reported by the National Fire Protection Association, which has released data reflecting that 85% of all United States fire deaths in 2009 occurred in residential occupancies (Ahrens, 2010).

The People's Burn Foundation of Indiana (PBF) and Campus Firewatch (2007, p. 3) report that there are more common factors between the national fire-fatality problem and the fire-fatality problem at college and university campuses. Aside from the fact that there is a similarity between where fires occur and where people die, the PBF and Campus Firewatch also contend that the following are contributing factors.

*Occupancies that lack automatic fire sprinklers.* Ahrens findings (2009, p. 5) support PBF and Campus Firewatch contention by saying "Fire sprinklers were present in only 5% of

home fires. The death rate per 1,000 reported home fires was 83% lower when wet-pipe sprinklers were present compared to reported home fires without any automatic extinguishing systems.” (§ 3).

*There were missing or disabled smoke alarms.* Ahrens (2009, p. 5) findings again support those of the PBF and Campus Firewatch when he indicates that “Properly installed and maintained fire protection can prevent most deaths. Forty percent of fatal home fire injuries resulted from fires in properties with no smoke alarms at all. Twenty-three percent were caused by fires in which smoke alarms were present but failed to operate.” (§ 5).

*Careless disposal of smoking materials was a common factor in the fire cause.* Hall reports in his research that of fire-related deaths occurring in 2008, 1 death in every 4 was caused by the careless disposal of smoking materials (Hall, Jr. , 2010). He further quantifies the danger of smoking, stating that in 2008 114,800 structure fires had this phenomenon as a cause, which resulted in 680 civilian deaths. Sadly, he also reports that of those fires, 25% of the people who sustained a fatal injury were someone other than the careless smoker (p. 3).

*Impaired judgment from alcohol consumption played a role.* NFPA data also supports this correlate between collegiate fatal fires and the national problem, as Hall (Hall, Jr. , 2010, p. 30) “Impairment is much more likely with smoking-material fires than with other fires. The percentage of fatal victims with possible alcohol impairment was 23% for smoking-material home fires in 2004-2008, compared to 11% for all other home structure fires with known heat source in ignition.” (§ 7).

A national media outlet, USA Today, in 2006 conducted a comprehensive study of 43 fatal-fires that involved college students. Having occurred between 2000 and 2006, USA Today also determined some contributing factors that support the data from the NFPA, PBF and

Campus Firewatch, but they made their findings related to alcohol the centerpiece for their investigative journalism. USA Today (Davis & DeBarros, 2006) found that of the fatal fires studied, 1 in 4 occurred after a party that involved alcohol, and that in 59% of the fatal fires, at least one of the students who died had been drinking.

According to the People's Burn Foundation and Campus Firewatch, the correlation between the nation's fire problem and the collegiate off-campus housing fire problem is significant because the factors found in off-campus fires are identical to the factors found in fires among the general population (2007). Of further significance is the fact that the similarities define the undertaking that faces fire-service leaders and stakeholders on every plane of the fire-fatality conversation: "If we can address the campus fire safety problem, this will have a dramatic impact in the next five, ten, or fifteen years in terms of fire safety across the nation as these students graduate and move onward." (2007, p. 3, ¶ 4).

There may be few places where this sort of undertaking could have a more dramatic effect than in Iowa City, Iowa. According to information from the 2000 United States Census, nearly two-thirds of Iowa City residents aged 25 and older possess a Bachelor's degree or higher – a statistic that more than triples the national average (United States Census Bureau, 2000).

During calendar years 2007-2009, Firehouse data collection records for the Iowa City Fire Department show that the ICFD responded to at least 278 fires and near-fire events that occurred in occupancies that could be classified as off-campus housing.

While a review of published literature related to collegiate off-campus fires clearly defines specific incidents, the demographic involved, and the contributing factors, Knisely (2010) offers that it is also important to create a specific definition for off-campus housing,

because “. . . you could find a differing opinion from just about everyone you ask. Off-campus housing varies greatly from town to town.” (§ 1).

Knisely further describes a setting very similar to Iowa City, when he states that off-campus housing could be defined as, among other things, Greek housing and other large apartment buildings that are privately-owned and not under university or college control (2010). Further, he states that the large majority of off-campus housing stock is comprised of older housing that is within proximity to campus. Most of these homes, he says, were

. . . once single-family homes that have been chopped-up and divided into apartments or rooming houses. Often times this was done long before there were fire codes in place that required building components or building structure to prevent or slow the spread of fire, and even longer before smoke alarms were required. (§ 2).

Investigative reporters Robert Davis and Anthony DeBarros at USA Today agree with Knisely’s contention that, in order to appropriately consider the problem of off-campus collegiate fire fatalities, the majority of housing stock within close proximity should be defined as off-campus housing. As part of their investigative report, they found that 76% of fires that claimed the lives of college students occurred in residential units within 2 miles of campus, while 73% occurred within 1 mile of campus (Davis & DeBarros, 2006).

Knisely states that in 2007, stakeholders gathered at Campus Fire Forum 9 in Austin, Texas, with the intention of defining what constituted off-campus housing (2010). In order to further understand all aspects of the off-campus fire problem, panelists considered events that seemed to be out-of-the-ordinary, such as 6 students from Clemson University who died in a fire at a beach vacation home, hundreds of American students who were safely evacuated from a fire at their spring-break hotel in Acapulco, and off-campus fires where victims included non-

household residents, such as family and friends. Knisely concluded that “. . . no definite determination could be reached and it was agreed that more discussion was needed to define the question.” (¶ 3).

Defining what constitutes off-campus housing is an important consideration for both understanding the problem and developing a strategy to reduce the associated risk, according to Iowa City Fire Department Deputy Chief Roger Jensen (R. Jensen, personal communication, January 29, 2011). The growing number of collegiate students who must live in off-campus housing and the non-centralized nature of the University of Iowa campus coupled with the thousands of rental apartments, single-family homes modified for multiple occupancy, and likely high number of residents who rent rooms illegally to students, all cause him to consider a great portion of the city’s residential districts to be considered off-campus housing. Jensen further states that his experience as an officer on the Iowa City Fire Department, and particularly his experience as the long-time Fire Marshal for the ICFD, lead him to believe that the residential areas within a two-mile radius of the University of Iowa campus are almost exclusively off-campus housing for college students (personal communication).

Jensen’s assertions are supported by a comparison of United States Census Bureau data for the City of Iowa City and the rental permit data maintained by the City of Iowa City Housing Inspection Services. Census data reveals that in 2000 Iowa City had 26,083 residential units (United States Census Bureau), while the Iowa City Housing Inspection Services database reveals that Iowa City has 16,795 residential rental units, providing 33,178 bedrooms (Appendix A).

The adoption and enforcement of fire codes is critical to impacting the off-campus fire problem, according to Ed Comeau of Campus Firewatch (Comeau, 2007). “There is no question

about it that the greatest risk to students and firefighters is in the off-campus environment. A vast majority of the students live off-campus, and there are a number of conditions that can lead to not only fires occurring in these occupancies, but also fire injuries and deaths, because of the unique problems they present. Improved building stock, frequent inspections, and strong codes can go a long way towards improving these conditions in the long term” (Comeau, ¶ 34).

Certainly, according to Comeau, who is one of the nation’s preeminent experts on the subject, fire codes are a critical piece to the puzzle. Any careful review of published literature, when conjoined with a responsible analysis of the factors that contribute to the problem of fire fatalities in off-campus housing, should determine what – if any – codes and standards seek to provide for occupant safety in Iowa City rental occupancies.

Because the direction offered by experts indicates that codes and standards are a critical component of addressing the student fire-fatality problem, a research question was formulated to reveal what standards exist at the industry, state, and local level to promote fire prevention in collegiate housing, with a focus on off-campus housing. Research reveals that standards in the fire-service industry are straight-forward and directly related to the factors contributing to fatal fire injuries.

*Industry standard.* In order to improve the likelihood of surviving a potentially disastrous fire, Ed Comeau (2010) identifies five steps for students to adhere to when selecting off campus housing. Directly related to contributing factors in student fire deaths, Comeau encourages students to (a) only consider off-campus housing that has no furniture or combustibles on the front porch, (b) make sure that any prospective living quarters have two clear, easily-accessible escape routes from every room and floor, (c) make certain that any occupancy have working smoke alarms, preferably interconnected electronically, (d) never allow a smoke alarm to be

disabled, and (e) make certain that any prospective apartment or house be equipped with a life-saving automatic fire sprinkler system.

Ahrens agrees with major points presented by Comeau, when he reports NFPA statistics that 63% of fire fatalities occur in occupancies where smoke alarms are either disabled or do not exist (Sept. 2010), and that people were 83% less likely to die in a fire that occurred in a home that was equipped with a sprinkler system (March 2010).

Many municipalities that host a college or university have adopted requirements for fire-safe construction and fire-safety engineering, and Calderwood and Bruno, both leaders in the fire-service industry, independently agree that enforcement of those codes and standards is an important piece of the puzzle. Bruno says that “When it comes to the off-campus rooming-houses and make-shift dorms, the local fire department has full responsibility to provide fire protection, which should include the power to inspect premises and order correction of code violations” (2008, ¶ 7). Calderwood concurs, offering an a multi-pronged initiative that includes (a) informing property owners that illegal apartments and occupancies that violate code requirements will be dealt with swiftly and seriously, (b) recommending that a building inspection task force inspect these occupancies, with representatives including housing inspectors, electrical inspectors, and professionals from the fire and health departments, and (c) a reporting function should be engineered to allow both fire department company officers and concerned tenants to report violations to the building inspection task force (2004).

Education is a key factor to resolving the college fire-safety problem, according to the collaborative study produced by the People’s Burn Foundation and Campus Firewatch, particularly because the collegiate fire-related fatalities and associated contributing factors have direct correlates among the fatalities and factors in the American fire problem (2007). According

to the study, a distinct lack of education – and a corresponding lack of fire-safety knowledge – exists in the ages between 10 and 65. This is due, according to the study, to the nationwide focus on providing public education resources to primarily the young and the aged (2007). The study issues a stark and sobering challenge when it asks why the fire service largely ignores educational opportunities for nearly 70% of the population, and yet expresses dismay when an elderly citizen is the victim of a preventable fatal fire injury. The PBF and Campus Firewatch contend that our expectations are unreasonable if we think it is more effective to change an elderly person's habits through education, rather than teach them to adopt a fire-safe lifestyle much earlier in life (p. 3).

*State standard.* The State of Iowa is governed in matters of fire safety and protection codes by Iowa Administrative Code 661, chapter 201.2, which subjects all buildings owned by the State of Iowa, and all municipalities, to the fire safety requirements of the International Fire Code, 2009 edition, published by the International Code Council (State of Iowa Administrative Code, 2010).

As a State of Iowa Regents Institution, the University of Iowa Residence Halls are subject to the fire safety requirements of the 2009 International Fire Code. Kate Fitzgerald, Assistant Director of UI Residence Halls, says that the University of Iowa is and has been committed to maintaining the strictest obedience to the International Fire Code (IFC), and all Residence Halls currently meet or exceed every fire safety requirement of that document (personal communication, February 15, 2011).

The scope of the 2009 IFC is broad, and its requirements – particularly as they relate to large residential occupancies like the University of Iowa Residence Halls – are exceedingly specific. The IFC governs such things as fire-safe interior finishes in chapter 8, installation,

inspection, testing and maintenance of fire protection systems in chapter 9, automatic fire sprinkler systems in section 903, means of egress in chapter 10, and a myriad of other features and systems intended to provide the safest possible environment to college students.

According to the University of Iowa Assistant Director of Residence Halls Kate Fitzgerald, the University's committed submission to the highest standards of the fire code do very little to prepare students for safe living when they transition to off-campus housing, because she feels that the high level of protection in the residence halls is taken for granted (personal communication, February 15, 2011). To help promote and even safer living environment, and also to instill safety-conscious living habits, Director Fitzgerald has instituted a number of living regulations that are carefully spelled-out in the *University Housing and Dining Guidebook* (2010).

In support of Fitzgerald's assertion that the University values life-safety education for students, the 5<sup>th</sup> point of the mission statement for University Housing and Dining states "*Safety* – University Housing and Dining creates and maintains a safe environment in which students can live and learn. Acknowledging that student safety is a partnership, we are dedicated to educating residents to make informed choices (§ 9). In an effort to promote both a safe environment and life-long safety habits, the University of Iowa imposes policy requirements on a number of student habits, proclivities and behaviors. Page 3 of the student rules acknowledges that alcohol consumption can lead to poor decision-making, and outlaws the consumption or possession of alcohol in on-campus residences, punishable by a \$700 fine and possible expulsion from the residence halls.

The guidebook also acknowledges that residential decoration can represent a significant fire hazard, and thereby forbids candles, decorations on any fire-safety equipment, anything

suspended from the ceiling or walls, and anything suspended that obstructs doorways, corridors, stairways, or any fire egress (p. 4). The guidebook also forbids any electrical appliance that draws more than 9 amps, as well as space heaters, cooking appliances, unauthorized extension cords and adapters, and overloaded electrical outlets (p. 5). Explosives and combustibles are expressly forbidden (p. 6), and specific procedures for notification of and evacuation in case of fire are detailed as required actions (p.6).

The guidebook also governs the malicious discharge of fire extinguishers and propping-open of fire doors (p. 9), mandates that smoke detector and sprinkler systems shall not be intentionally or accidentally disabled, and bans the use of cigarettes (p. 11).

According to Fitzgerald, the University requires that students attend multiple meetings in their first two weeks of residence where all rules and requirements related to fire safety are clearly detailed (personal communication, February 15, 2011).

*Municipal standards.* While State of Iowa Code adopts the 2009 International Fire Code, for the state and municipalities contained therein, an amendment exists in the adopting chapter to allow municipalities the latitude of home-rule in adopting fire codes. Iowa Code 661-201.5 (100) mandates that any building, structure, or facility shall comply with the 2009 IFC unless that structure exists in a local jurisdiction that has adopted any other edition of the IFC, any version of the Uniform Fire Code published by the National Fire Protection Association, or the 1997 edition of the Uniform Fire Code published by the Western Fire Chiefs Association (State of Iowa Administrative Code, 2010).

The City of Iowa City complies with the requirements of the Iowa Administrative Code by mandate of the 2010 Iowa City City Code, which establishes the adoption of the 2009 International Fire Code (2010).

The City of Iowa City Housing and Inspection Services is the Authority Having Jurisdiction for all rental occupancies within the corporate city limits. The housing inspection program has been in existence since the early 1970's according to Senior Housing Inspector Stan Laverman, and has experienced continuous improvement in both codes and enforcement measures that have resulted in a safer environment for students who live off campus (personal communication, February 15, 2011).

According to Laverman, Iowa City's rental properties are governed in matters of construction and fire safety by the International Building Code edition under which the structure was built, and the 2008 edition of the Iowa City Housing Code (personal communication).

The International Building Code is both a model and comprehensive building code which established minimum regulations for buildings, building materials, and building practices which set forth prescriptive and performance-based standards. Where it pertains to a safe living environment for college students, the International Building Code sets standards for fire-resistance-rated-construction, interior finishes, fire protection systems, means of egress, and electrical systems (International Building Code, 2009).

The City of Iowa City Housing Code contains a myriad of references to the International Building Code, and also sets forth local amendments (City of Iowa City Housing and Inspection Services [Iowa City HIS], 2008). The purpose of the code is declared to ensure that housing facilities and their associated living conditions are of sufficient quality to protect and promote the health, safety and welfare of both occupants and the general public. It also sets forth the responsibilities of all stakeholders in maintaining compliance, to include the owner, landlord, occupants, and officials of the city (2008).

The City of Iowa City Housing Code defines a legal and operable dwelling unit as “Any habitable room or group of adjoining habitable rooms located within a dwelling and forming a single unit with facilities which are used or intended to be used for living, sleeping, cooking, eating of meals and sanitation” (Iowa City HIS, 2008, p. 17-5-3).

The Housing Code requires that all structures containing rented dwelling units, as well as the units themselves, be inspected by a code official on an annual basis, and that legal habitation of any buildings or units is predicated upon the issuance of both a Certificate of Structural Compliance and a valid Rental Permit, both of which are predicated upon the positive findings of the housing inspector (Iowa City HIS, 2008).

According to Stan Laverman (personal communication, February 15, 2011), the Housing Code refers largely to the requirements of the 2009 International Code Council where matters of fire safety are concerned. One problem, he cites, is that buildings constructed in decades past are primarily only required to meet the minimum standards of the building code that was valid at the time of construction. He states that this creates a wide line of fire-safety demarcation between rental units in newer buildings and units in older, retro-fitted houses that once were single-family homes and may be between 100 and 150 years in age. According to Laverman, the latter has deficiencies in electrical systems, fire separation, alarm and suppression systems, and fire-resistance-rated construction, while the former are likely to have monitored alarm systems, automated fire protections systems, fire-rated building construction materials, and modern electrical systems (personal communication, February 15, 2011).

The Housing Code does contain local amendments to the International Building Code that seeks to instill a degree of fire safety in all rental units, even those that are subject to an antiquated version of the International Building Code. Specifically, the City of Iowa City

Housing Code requires every structure containing a dwelling unit to have at least one unobstructed and continuous means of egress to a public way, and further requires occupancies that exceed 3,000 square feet or 10 occupants to have at least two independent and unobstructed means of egress, located remotely from each other, that discharge directly to a public way (Iowa City HIS, 2008). Similarly, the Housing Code requires that units located either below or above the first floor have no less than two exits, in addition to escape and rescue windows that must be located in each sleeping room (2008).

The Iowa City Housing Code also contains local amendments that require rental occupancies, regardless of their classification or construction date, to contain a ICFD Fire Marshal approved 5 pound, 2A, 10BC fire extinguisher in every common area, utility room, laundry room, and dwelling unit. Further, the code requires all occupancies to have installed a functional, ICFD Fire Marshal approved smoke detector to be located “on each floor level, including basements, in each bedroom, and hallways serving bedrooms (p. 17-5-18).

While experts agree that fire codes can have a considerable impact on the American fire fatality problem in general, and the off-campus fire fatality problem specifically, many sources also indicate that codes are only a part of the solution. According to the editor of *Campus Firewatch* and the former lead fire and arson investigator for the NFPA “A phrase that is often heard is that you can build the most fire safe building in the world, until you put people in it” (Comeau, 2007, ¶ 35).

Paul Calderwood is a career Deputy Fire Chief and also a fire safety engineer for Tufts University – a university that has lost students to fire in off-campus residences. Calderwood contends that college students a reasonable expectation to live in a safe environment, no matter where they live, learn, and enjoy recreation time (Calderwood, 2004). Calderwood believes that

students seeking an education should get one, and that an important part of that education should include equipping students with the knowledge, skills, and abilities to protect themselves, make wise decisions, and develop habits that will help to minimize the risk of preventable injury or death (2004).

The People's Burn Foundation and Campus Firewatch teamed together and produced a comprehensive study regarding the attitudes and views toward fire safety of college students (The People's Burn Foundation of Indiana and Campus Firewatch, 2007). The study methodology utilized focus groups, questionnaires, and open dialogue that included 584 students at 20 colleges and universities from all geographic regions of the country. The findings of the study revealed that students have a significant lack of knowledge related to fire and burn safety that was clearly demonstrated at every phase of the project. The study concludes that the insufficient knowledge base is not the fault of the students, but the responsibility of the fire safety community at-large, which has failed to develop and deliver educational programs geared toward educating the student population (2007).

The PBF and Campus Firewatch study yields interesting data that reveals a significant lack of fire safety knowledge among college students. Of the hundreds of students surveyed, only 28% were able to identify smoking as the leading cause of fatal home fires. The remainder either identified the incorrect multiple-choice answer, or admitted that they didn't know (The People's Burn Foundation of Indiana and Campus Firewatch, 2007, p. 9). When asked what steps a student should take when they are in a room that is on fire, only 108 of 492 respondents selected "evacuation activities" as the correct multiple-choice answer. The remaining 384 students either answered that they did not know the actions to take, or they chose an incorrect action (2007, p. 8).

The PBF and Campus Firewatch report concludes that of the students studied, very few showed acceptable attitudes, knowledge, and abilities toward fire safety. The report states that “Much of this is because fire safety education stopped when the students were in elementary school and has not started up again until they were in college. The message did not mature with the audience and it is an opportunity to fill in this gap and start them on a new continuum of learning throughout the rest of their lives” (The People’s Burn Foundation of Indiana and Campus Firewatch, 2007, p. 27).

Kanterman and D’Amore Jr. lament the state of post-elementary public education, and the effect it is having on the collegiate fire-fatality problem by saying that an irony exists that grade school children display a higher level of fire safety acumen while adults remain uneducated (2001). In most jurisdictions, according to those authors, fire safety education generally is suspended around the sixth grade, and as people progress in age they either forget important fire safety lessons, or develop an attitude of indifference (2001).

Paul Calderwood is one of many fire service experts to offer a model program based on reducing the fire-fatality risk among college students living in off campus housing. His program, developed as a result of a fatal off-campus fire at Tufts University, where he is employed, focuses on risk identification, enforcement, and fire safety education (2004).

According to Calderwood, Tufts utilizes an inspection task force, comprised of members of the fire department and other code enforcement experts to convey the message to landlords and property owners that illegal units, overcrowded apartments, and negligence with regard to maintaining required fire safety and suppression equipment will result in legal action by authorities (2004). Also, easy reporting systems have allowed concerned residents to anonymously report fire safety concerns, and fire department company officers, who respond to

emergencies in problem occupancies to relay information directly to the task force for follow-up (p. 2).

Calderwood also contends that education is an important component, not just for students, but for other stakeholders as well (2004). He states that company officers who discover unsafe conditions at off-campus residential units should immediately have the owner of the building contacted so that the unsafe condition or the violation of code can be explained. Further, the company officer then has a teaching opportunity to convey to the property owner that the fire department values code compliance and life safety, and that an expectation for timely mitigation exists (p. 4).

Students also must be educated, and Tufts University requires all incoming freshmen to attend a life safety seminar entitled *Operation Awareness* (Calderwood, 2004). This seminar allows the Fire Marshal's office to educate students on the importance of fire safety, and convey information that will allow the students to make wise decisions related to off-campus living (p. 4).

Ed Comeau reports on the unique program developed by Wesleyan University in his hometown of Middletown, Connecticut in response to the 2000 fire that killed 3 students at Seton Hall University and sent subsequent shock waves through the nation's colleges and universities (Comeau, 2008). Comeau reports that Wesleyan University owns a considerable stock of single-family homes that have been converted to multiple-occupancy, and operates them as rooming houses where the majority of students live (p. 2).

The leadership of both the Middletown Fire Department and Wesleyan University interpreted the fatal incident at Seton Hall as a wake-up call, according to Comeau's article, and

immediately purposed to undertake an aggressive initiative that would culminate in educated students and housing that was retrofitted with fire detection and suppression systems (2008).

Comeau reports that the leadership of the local fire department and the administration of the university forged a strong working relationship that agreed to initially identify all collegiate housing that was occupied by five or more students, and commit to equip those occupancies with modern alarm systems and automatic sprinkler systems. This action culminated in a bond referendum that provided the millions of dollars necessary to initiate work on the student housing.

While many dozens of buildings have been painstakingly retrofitted with advanced sprinkler systems, at great expense and in a number of phases, Comeau states that detailed planning and a close working relationship between community and university stakeholders has proven invaluable.

Ronald Kanterman, the Chief of New Jersey's Merck Emergency Services, and Frank D'Amore Jr., a career Fire Marshal in the same state, report on an intervention program that Merck developed, also as a result of the Seton Hall University fire that killed three and injured 53 people (2001).

The authors recommend that fire safety professionals rethink their approach to risk reduction, when they say that the our country has "the worst civilian fire death record of all industrialized nations despite technological improvements in protective gear and equipment and code development" (Kanterman & D'Amore, Jr., 2001, p. 1). They continue to say that it isn't necessarily model codes, fire alerting devices, and suppression systems that make the difference in fire prevention, but that the human factor – people and their behavior, attitudes, and knowledge that define our ability to prevent incidents, rather than respond to them once they

occur (p. 1). Kanterman's organization has designed two different programs that aim to student attitudes about fire safety awareness and the lifestyle habits that are common contributors to fires in off-campus housing:

*Student Emergencies in Life and Fire (SELF)*. This program intends to address the lack of fire prevention awareness training beyond the grade school age in most municipalities, and is geared primarily toward reinforcing fire and life safety lessons in the demographic that is transitioning from high school to college, and their parents (2001). The class utilizes lectures, college fire safety videos produced by the United States Fire Administration, and hands-on evolutions to convey the importance of fire safety.

The SELF program utilizes easy-to-understand lessons about physiological effects of fire gasses, fire behavior, growth, and spread, and common causal and contributing factors to fires that occur in off-campus housing (2001). Practical demonstrations also play a prominent role in helping students identify with and appreciate the problem. The authors state that audience members who have been affected by fire are asked to share their experiences, and are subsequently asked to answer questions related to their behavior in a fire environment, whether or not they were scared at the time, if they believe they acted appropriately at the time, and if they lost anything valuable in the fire (p. 2).

Volunteers from the audience are solicited to come before the class, and are asked to spend a moment studying their surroundings, in order to commit their familiarity to memory. Participants in the program are then asked to don a zero-visibility mask, and are spun several times in circles, at the same time that recordings of fire ground noises are played over the audio system. The participants are then asked to get on hands and knees and quickly work toward the door of the classroom or auditorium. According to the authors, participating students generally

become disoriented quite easily, and a subsequent debriefing in front of the entire group proves very profitable as participants describe what they thought and how they felt, with students from the audience being encouraged to ask questions and provide input (Kanterman & D'Amore, Jr., 2001).

*Fire and Injury Prevention in the Home (FAITH)* – This program was created in order that fire department personnel in the authors' home jurisdictions would have objective, clearly-defined guidelines by which to assess fire safety in residential occupancies (p. 4). The major catalyst for this program was the collaborative effort between the Eveready Corporation and the International Association of Fire Chiefs that resulted in the *Change Your Clock, Change Your Battery* campaign. This program presented the first opportunity for fire department personnel to enter residential occupancies and create a fire safety dialogue with residents (p. 4).

From that initial opportunity, the development and implementation of *Fire and Injury Prevention in the Home* allowed solicited fire department personnel a means to provide local residents with education and training regarding fire prevention inspections, smoke detectors, home fire escape plans, household hazardous materials, cooking safety, smoking safety, and other important topics related to fire and life safety in the home (Kanterman & D'Amore, Jr., 2001).

*FAITH* also provides for a post-incident neighborhood canvassing component (Kanterman & D'Amore, Jr., 2001). When a significant event occurs, such as an accidental structure fire, fire department members may initiate a letter-canvas campaign of the neighborhood, inviting citizens to attend the scene and receive a pertinent fire prevention message that people can relate to, and as a result of which people are more likely to change their behavior (p. 5).

While not all incidents are recommended for this sort of campaign, such as arson fires or fires involving juvenile fire setters, inviting people back to the scene for a carefully supervised lesson, conducted strictly in the interest of fire safety, can yield great results. The author's recount a story regarding a fatal fire in their jurisdiction that investigators determined to have been caused by combustibles stored too close to the furnace. Fire department educators were able to educate neighbors about the events leading up to the fire, the incident itself, the fire cause, and ways to prevent a similar incident from occurring in the neighbors' own homes (Kanterman & D'Amore, Jr., 2001).

Marketing and funding are also critical components necessary to support the education effort, according to the authors (Kanterman & D'Amore, Jr., 2001). To that end, *FAITH* provides guidelines for marketing the program, including promoting the program through local media outlets, utilizing banners and billboards, and conducting formal kick-off ceremonies at the city administration building, which may include a proclamation by the municipal government (p. 4). *FAITH* also stresses the importance of internal marketing strategies, as well, and requires that all fire department members are well-versed in the program, and have easy access to pamphlets promoting its educational opportunities. According to the authors, this invaluable component helps make certain that no citizen ever contacts the fire department for program information only to be asked to call back at a later time when a single program coordinator may be reached (p. 4).

*FAITH* encourages fire departments in cash-strapped municipalities to establish a list of community partners that are willing to contribute funds and in-kind resources (Kanterman & D'Amore, Jr., 2001). The program provides a general list of possibilities for partnership, to include the local chamber of commerce, insurance agents, fraternal organizations, lumber yards and hardware stores, and utility companies (p. 5).

While the United States is the richest and most well-developed nations in the world, and possesses both fire departments and fire protection engineering that may be considered the global standard, the sad reality is that far too many people die every year in residential structure fires (Ahrens, 2010). While the victims comprising these statistics come from diverse backgrounds, wide-ranging economic status, and locales ranging from rural area to the largest cities, the literature reviewed as part of this research project indicates that a majority of these deaths may be easily preventable (Ahrens, 2009).

The fire service has been increasingly involved in fire safety and fire prevention education for many decades, yet authors have begun to continually criticize the lack of vision that leads most of these endeavors to stop somewhere around the 6<sup>th</sup> grade (The People's Burn Foundation of Indiana and Campus Firewatch, 2007; Comeau, 2007; Kanterman & D'Amore, Jr., 2001). Where the problem of collegiate fire fatalities in off-campus housing is concerned, a terrific opportunity exists to educate people who are living on their own for the first time, and not only instill living habits that will keep students safe in their homes, but create a lifelong culture that may ultimately help reduce the larger problem of fire fatalities in America (The People's Burn Foundation of Indiana and Campus Firewatch).

The literature review conducted as part of this research project illuminated answers for the three research questions, which are: (a) what are the industry, state and local standards for fire prevention in off-campus collegiate housing, (b) what have other fire service organizations done to enhance fire safety among college students living in off-campus housing, and (c) what methods should the Iowa City Fire Department utilize to reduce the risk among University of Iowa students living in off-campus housing?

The literature review also provided facts and figures, both nationwide and in Iowa City, related to the number of college students, the number of college students who live in off-campus housing, the conditions of the housing stock in which they live, the number of fatal fires involving college students in the past decade, and an overview of the codes, standards, and varied educational initiatives that seek to mitigate those fire deaths. Perhaps most importantly, the literature identified some common causal and contributing factors to fires that have claimed the lives of college students.

### Procedures

The procedures utilized in this applied research project included identification and formulation of a problem statement and research purpose, selection of the descriptive research methodology, and identification of research questions related to both the research problem and purpose. Further procedures included an intensive review of related literature, the administration of three interviews conducted in person. It should be noted that a specific portion of the research related to programs at the University of Colorado focused on materials, notes, and personal communication from the researcher's attendance at a *Campus Fire Forum* symposium conducted in Boulder, Colorado in the summer of 2005. Due to the time elapsed since, written permission was obtained from the Boulder Fire Department Fire Safety Education Coordinator to reference these resources.

The research problem and purpose were identified by the researcher's experience as a member of the Iowa City Fire Department Fire Prevention Bureau command staff, a company officer who has responded to thousands of emergency calls in off-campus collegiate housing, and a public safety educator.

Research questions were developed to determine: (a) what are the industry, state and local standards for fire prevention in off-campus collegiate housing, (b) what have other fire service organizations done to enhance fire safety among college students living in off-campus housing, and (c) what methods should the Iowa City Fire Department utilize to reduce the risk among University of Iowa students living in off-campus housing? Interview subjects were carefully considered, and interview questions formulated to identify what codes, standards, policies and initiatives were currently in place to mitigate the risk of fire fatality, as well as to identify the opinions of experts regarding the effectiveness of those efforts.

A literature review was conducted to identify plausible answers regarding what codes and standards exist to reduce fire-related risk in off-campus collegiate housing, what other organizations have done to enhance fire safety in these occupancies, and identify initiatives that may be recommended for use by the Iowa City Fire Department. Separate in-person interviews were conducted with Iowa City's Senior Housing Inspector and the University of Iowa's Assistant Director of Housing to provide insight into the first and third research question. An in-person interview was conducted with the Fire Marshal of the Iowa City Fire Department to provide answers to all three research questions. The literature review and all interviews were also invaluable in helping the researcher better define the scope of the problem statement and the purpose of the research.

The literature review was first undertaken at the National Fire Academy's Learning Resource Center (NFA LRC) during September 2010, when the researcher attended Executive Analysis of Community Risk Reduction (EACRR). The LRC afforded the opportunity to explore collections related to the fire fatality problem in general and the collegiate off-campus fire problem specifically. The researcher reviewed dozens of publications including books, trade

journals, magazines, EFO ARP's, and multimedia sources. Subsequent searches for literature were conducted in the researcher's home town of Iowa City, at the Iowa City Public Library. References were also consulted from the ICFD training resource library, the ICFD Fire Prevention Bureau library, and the code enforcement library located in the Iowa City Department of Housing Inspection Services. The researcher's personal collection of fire service professional publications was also utilized, which included publications, notes, and media from previous personal attendance at a symposium related to the research topic. The internet was used to research media archives, web pages of fire departments, colleges and universities, and to access the databases maintained by professional fire service publications. Finally, a list of electronic resources related to effective research practices and project development techniques, supplied to this researcher in 2009 by Mr. Bernard Becker, was referenced frequently.

Three interview instruments were used to gather critical information related to fire-fatalities in off-campus collegiate housing. The first interview was conducted on February 17, 2011 at ICFD headquarters, and had as the subject Iowa City Fire Marshal John Grier. The Fire Marshal has 20 years of experience in the ICFD and is a graduate of the Executive Fire Officer Program. He holds a Bachelor's Degree in Psychology and a Master's Degree in Fire Science. He currently serves as President of the Iowa State Fire Marshal's Association. A transcript of the interview is located in Appendix A.

The purpose of the interview with Fire Marshal Grier was to validate and further define the research problem and purpose. The interview instrument was also designed to answer, in part, the first and third research questions, which are: (a) what are the industry, state and local standards for fire prevention in off-campus collegiate housing, and (c) what methods should the

Iowa City Fire Department utilize to reduce the risk among University of Iowa students living in off-campus housing?

In addition to the general goals of the interview as stated above, the researcher consulted the *Community Risk Reduction Model* found in the EACRR handbook and attached as Appendix D. The researcher concluded that some, but not all steps of the risk reduction model could be partially satisfied by interview responses.

With that supposition in mind, questions 1, 2, 3, 4, 5, 8, and 10 were developed by the researcher to provide an analysis of community-specific information, identify hazards and causal factors in fires, and assess the vulnerability of college student living off-campus. Questions 6 and 7 were developed to identify organizational and personal responsibility, as well as identify resources. Question 8 was developed to create risk reduction objectives, in addition to the goals listed previously in this paragraph. Question 10 was developed with the intention of determining if current standards, codes, and initiatives defined a level of risk that was determined to be acceptable. All of the goals related to these ten questions are classified under the assessing community risk, intervention strategies, and action plans of the community risk reduction model (Appendix D).

A second interview was conducted on February 15, 2011 in the City Hall office of Stan Laverman, the Senior Housing Inspector for the City of Iowa City. Mr. Laverman is the senior code enforcement official for the City of Iowa City in matters pertaining to residential and rental occupancies. He is certified as an International Residential Building Code Inspector. The results of the interview are located in Appendix B.

The purpose of the interview with Mr. Laverman was to validate and further define the research problem and purpose. The interview instrument was also designed to answer, in part,

the first and third research questions, which are: (a) what are the industry, state and local standards for fire prevention in off-campus collegiate housing, and (c) what methods should the Iowa City Fire Department utilize to reduce the risk among University of Iowa students living in off-campus housing?

Questions 1, 2, 3 and 4 were developed to analyze the rental housing stock of the community, particularly where compliance to minimum code requirements is concerned, and to assess related vulnerabilities. Question 3 additionally was designed to determine the degree to which Iowa City rental units are equipped with automatic suppression systems. Question 5 was developed to identify common code violations related to fire risk, in order that hazards might be identified and associated vulnerability assessed. Questions 6 and 7 were designed to determine if there are non-compliant occupancies in Iowa City that are being rented illegally to college students. It was assumed that the answer to these questions would help further analyze the community, assess risk and identify hazards, and establish priorities based on those risks, if any existed. Question 8 was designed to determine the attitudes of property owners, to help define stakeholder-engagement strategies. Question 9 was developed to solicit Mr. Laverman's expert opinion regarding priorities for rental unit selections, based on how he would counsel a family member conducting a housing search.

On the afternoon of February 15, 2011, a third in-person interview was conducted with Kate Fitzgerald, the Assistant Director of Housing Services for the University of Iowa. The researcher has extensive experience working with Ms. Fitzgerald to develop and institute a Fire Academy for Resident Advisors at UI. In her capacity as Assistant Director, Ms. Fitzgerald is directly responsible for every aspect of student life in the UI residence and dining halls. Academic and social programming, the oversight of residence halls and their respective

managers, policy development and enforcement, the student discipline process, crisis management and roommate management, and the safety and security of residence halls all fall within her areas of responsibility. Aside from being an experienced and progressive director of these services, Ms. Fitzgerald is the daughter of a career firefighter and is known to be a strong and informed advocate for fire safety initiatives. The interview instrument is included as Appendix C.

The purpose of the interview with Kate Fitzgerald was to validate and further define the research problem and purpose. The interview instrument was also designed to answer, in part, the first and third research questions, which are: (a) what are the industry, state and local standards for fire prevention in off-campus collegiate housing, and (c) what methods should the Iowa City Fire Department utilize to reduce the risk among University of Iowa students living in off-campus housing?

Question 1 was designed to define Director Fitzgerald's areas of influence and responsibility at the University of Iowa, and to establish her qualification as the University of Iowa's (UI) leading expert pertaining to the subject matter of the interview. Question 2 was developed to analyze the record size of 2010 UI enrollment, and to characterize the institution's responsibility to provide for student safety. Questions 3 and 4 intended to analyze the student community, identify potential hazards, and assess vulnerability of the demographic. Questions 5, 6, 7, 9, 10, and 11 were developed to analyze the student community, assess vulnerabilities, establish priorities based on rated risks, and provide insight toward the creation of risk-reduction objectives. Question 8 was appealed to Director Fitzgerald's expertise in educating a diverse and dynamic student population, in order to potentially create risk-reduction objectives and identify potential strategies. Question 12 sought to evaluate the authority and politics surrounding

development of a risk-management partnership, and provide insight into how a plan might be developed toward that end.

There are pertinent limitations that became apparent during the course of the research. The most notable limitation is the relatively short time that student fire-fatalities in off-campus housing has been clearly defined as a problem. The Center for Campus Fire Safety and the Campus Firewatch program is the first organization to carefully monitor and define the problem. The relatively young organization has only been compiling collegiate fire-death statistics for a decade, and associated research into causal and contributing factors is even younger (Bruno, 2009). A great deal of information has been published in trade journals and professional fire service magazines regarding the problem. Very few comprehensive research studies have been conducted, however, and virtually no books have been published on the topic.

The lack of reliability in accurate reporting of fires in off-campus housing generally, and in collegiate fire fatalities specifically, is also classified by this researcher as a limitation to the project. Campus Firewatch relies mainly on a survey of media reports to collect fatality data, and it is almost certain that some fatalities have gone under-reported. Further, as a function of nationwide incident reporting, it is often problematic for local fire jurisdictions to accurately identify whether fire-affected occupancies are defined as off-campus collegiate housing.

A research limitation that is associated with the first research question pertains to the sheer overwhelming volume of fire safety and fire prevention components present in the International Code Council series of standards. The researcher believes that a thorough research project would seek to identify each code component related to fire safety and summarize its impact on the problem and purpose, but the reality remains that any such effort would simply be a chapter-by-chapter review of hundreds of code sections.

Finally, the researcher's inexperience in developing a comprehensive risk-reduction program must be identified as a research limitation. During the course of the research, it became increasingly apparent that the logistical problems are numerous. Tens of thousands of college students, possessive of virtually no current fire-safety knowledge, live in a diverse and high-tempo environment, and their limited attention is coveted by innumerable interests. The researcher endeavored to minimize the limitations of scope and inexperience by carefully developing interview questions in accordance with EACCR's *Community Risk Reduction Model* (Appendix D) and the research problem and purpose.

#### *Definition of Terms*

Automatic Fire Alarm System – a fire alerting system comprised of electrical circuits and devices that are designed to detect products of combustion or actuation of fire suppression systems and alert occupants.

Automatic Fire Sprinkler System – An engineered system of piping, connected to a water supply on one end and sprinkler heads on the other, which is specifically designed to actuate during a fire, discharging water to control the growth and spread of fire.

Automated Fire Suppression System – An approved system of devices and equipment which automatically detects the presence of fire and releases an approved extinguishing agent onto the area of fire.

Balloon Frame Construction – A system of framing a wooden building that allows open stud spaces along the full height of the building frame; allows for rapid fire communication to all levels of the building.

Building Code – a model set of minimum standards and local amendments used by architects, builders, and governmental plans review and code enforcement agents that set forth

construction requirements during the design, construction, and inspection phases of a structure's life.

EACCR – Executive Analysis of Community Risk Reduction

NFPA – National Fire Protection Association.

PBF – The People's Burn Foundation of Indiana.

Residence Hall – a large building comprised of many residential occupancies used by colleges and universities to house large numbers of students.

Resident Advisor – a student leader living in a residence hall who is charged with managing a specific area of the hall, generally an individual floor. The Resident Advisor is tasked with enforcing safety rules and regulations, education resident students about policies and procedures, and incident specific training, such as fire evacuation drills.

USFA – United States Fire Administration.

## Results

The literature review and three separate interviews answered the first research question. The interviews were conducted with ICFD Fire Marshal John Grier, City of Iowa City Senior Housing Inspector Stan Laverman, and University of Iowa Assistant Director of Housing Kate Fitzgerald.

1. What are the industry, state and local standards for fire prevention in off-campus collegiate housing?

Nearly every piece of literature consulted in the course of the research referenced the importance of codes and standards in general, and the use of modern and functional fire detection and suppression systems specifically, as being critical components in mitigating fatal fire

injuries. The International Code Council series of regulations, to include the International Fire Code, the International Building Code, and the International Residential Code, among others, is the most widely accepted and adopted version of codes in the country (International Code Council, 2010, ¶ 1). The International Code Council is the result of many regional code standard authorities combining in 2000 to create a single internationally-recognized series of codes related to design, construction, maintenance, and operation of buildings. Currently, the International Building Code (IBC) has been adopted at the state and/or local level in 50 states and Washington, D.C. The International Residential Code (IRC) has been adopted at the state and/or local level in 48 states, Washington D.C., and the U.S. Virgin Islands. The International Fire Code has been adopted at the state and/or local level in 42 states and Washington D.C. (ICC, 2010).

Defining the scope of the IBC, IFC, and IRC is a staggering undertaking. For the purposes of this research however, the individual scope of authority is defined for the IBC as pertaining to fire-safe building practices and the design of fire detection and suppression systems in all buildings and residential occupancies, excluding one-and-two family homes. The residential occupancies governed by the IBC are classified as Group R-1, R-2, R-3, and R-4 (International Building Code, 2009, p. 34). These occupancies are generally classified as hotels, motels, apartment buildings, dormitories, fraternities and sororities, and certain care and congregate facilities (p. 34).

The IRC defines fire-safe building practices and the design of fire detection and suppression systems in one-and-two family occupancies, which are classified as Group R (International Building Code, 2009). These occupancies are defined as buildings or structures used for sleeping purposes that are not classified as Group I, which in-part are hospitals, nursing

homes, residential care facilities, group homes and jails (2009, p. 33). Group R also specifically excludes Groups R1 through R-4, which are governed by the IBC (p. 34). Effectively, these definitions illuminate all potential occupancies used for sleeping and habitation, with the exception of one-and-two family homes.

While the IBC and IRC govern the design and building requirements for occupancies during the construction phase, the International Fire Code governs the operation and maintenance of any building, relating to fire prevention, which has been completed.

The wide-spread adoption of the IBC, IFC and IRC, as well as the adoption of these code standards in the researcher's home state and city, define it as an industry, state, and local standard related to fire prevention (IBC, 2010; State of Iowa Administrative Code, 2010; Iowa City City Code, 2010).

A survey of these codes reveals a pertinent finding – that all three code standards require automatic and manual fire detection systems and automated fire suppression systems where people live and sleep. The IBC and IFC both contain strict requirements for alarm systems in their respective Section 907 (IBC, 2009; IFC, 2009), while the IRC list requirements for detection systems in Section R313 (IRC, 2009). Likewise, the IBC and IFC contain requirements for sprinkler systems in Group R occupancies in Section 901 (IBC, 2009; IFC, 2009). The IRC contains a notable requirement in the 2009 edition, which requires all new residential one-and-two family occupancies, as of January 2011, to be built with a NFPA 13D-compliant automated fire suppression system (IRC, 2009).

The researcher discovered that, based on the specific grouping and use of the occupancy, exceptions and variations to requirements are far too numerous to summarize. Generally speaking, however, all Group R occupancies are now required to be protected by an automated

fire suppression system in accordance with NFPA 13D or NFPA 13R. The IBC and IFC require automatic fire detection systems in all Group R occupancies, generally requiring smoke detectors to be located in each sleeping room, in every common area, and on every floor of the building (IBC, 2009; IFC, 2009). Similarly, the IRC requires smoke detectors to be located in every sleeping area, immediately outside each separate sleeping are, and on all floors of a new home (IRC, 2009).

There are limitations and exceptions to these requirements, however. While these codes have increased fire safety and prevention requirements, it must be noted that they have had their effect only largely on newer buildings. This means that generations of older – and potentially more dangerous – housing stock is only required to comply with older sections of the codes, thereby subjecting them to lower standards (S. Laverman, personal communication). Another notable limitation is the fact that adopting states and municipalities are generally allowed by their own code of laws to make local amendments to IBC, IFC, and IRC requirements. This is notable in Iowa City, where a successful lobby against the residential fire sprinkler requirement was successful. Opponents cited increased construction costs and a less-competitive housing market in convincing the City Council to pass an amendment ignoring the sprinkler system requirements of the 2009 IRC (Iowa City City Code, 2010).

Several fire service experts have concluded these codes, as written, can be the most important agents in reducing fire fatalities, both in off-campus collegiate housing and nationwide. Data compiled by the National Fire Protection Association reveals that 66% of people who lose their lives in residential fires were never alerted by a detecting device, because one was either not present, or was not functional (Ahrens, 2009). The NFPA also published

information that concluded that a person involved in a fire had at least an 86% greater chance of survival if automatic fire sprinklers were present (2009).

Campus Firewatch and the People's Burn Foundation found that statistics related to collegiate off-campus fire deaths almost perfectly mirror those of the greater U.S. fire fatality problem. They conclude that of 5 contributing factors in off-campus fire fatalities, 2 of the most common are lack of automatic fire sprinklers and lack of functional detection instruments (The People's Burn Foundation of Indiana and Campus Firewatch, 2007).

ICFD Fire Marshal John Grier contends that implementation of model codes requiring fire sprinklers is the most important initiative the ICFD could undertake to reduce the risk of fatal fire injuries in off-campus housing (personal communication).

As a result of the research and the literature review, the researcher has concluded that the industry, state, and local standard for fire prevention in off-campus collegiate housing is adoption of and compliance with the 2009 editions of the International Building Code, International Fire Code, and International Residential Code. These codes provide numerous standards to prevent fatal fires, most notably the installation of approved, automated sprinkler systems in all residential occupancies. The researcher has determined emphatically that these are the model standards, and that the sprinkler requirements must be left intact by adopting authorities for these to be considered sufficient standards.

The literature review was largely used to answer the second research question. Other information relied upon was the material and notes the researcher gathered while attending *Campus Fire Forum* in Boulder, Colorado in 2005. Notes taken by the researcher during that symposium reflect personal communication with and lecture content by Sherry Kenyon, the Fire Safety Education Coordinator for the Boulder Fire Department.

2. What have other fire service organizations done to enhance fire safety among college students living in off-campus housing?

The research related to this question revealed that the American fire service has largely failed to establish fire-safety education as a priority for college students and those preparing to attend college.

A study prepared by the People's Burn Foundation and Campus Firewatch poses a challenging question:

Across the nation, there is a distinct lack of fire safety education being provided to the public between the ages of 10 and 65. This means that approximately 68% of the population does not receive regular fire safety information that can help to save lives. So often we are dismayed when an elderly person dies because they did not have a smoke alarm and were smoking while on oxygen. What we're asking is unreasonable – for a person to change a lifetime of unsafe habits and practices. Wouldn't it be better to change these when they are younger? (2007, p. 3)

After a fatal fire at Seton Hall University in 2000, colleges and fire service professionals across the country began to more seriously consider the problem of collegiate fire deaths.

Wesleyan University, in Middletown, Connecticut, performed a risk-assessment of their campus and concluded that the 130 wood-frame, unprotected, multiple-occupancy houses the university owned and operated as student housing represented a significant risk (Comeau, 2008). Prior to the Seton Hall incident, Comeau reports that local fire department officials and university administration were never able to find common ground when assessing fire prevention requirements, largely because of the financial impact (2008). A realization of the seriousness of

the problem, however, caused both parties to join a partnership designed to identify best practices for securing the fire safety of Wesleyan students (§ 6).

After identifying the problem, Wesleyan immediately hired an administrator who was an expert in fire safety. The team comprised of fire department and university officials decided that their guiding principle would be that the fire and life safety of students was their highest priority, and they agreed that the most effective way to accomplish their mission was retrofit all 130 residential occupancies with sprinkler systems (Comeau, 2008).

Initially, the cost alone seemed staggering. The partnership decided to forward a bond proposal for funds to accomplish their goal in a set of phases. The bond referendum passed, which was an indicative of the high value community members placed on fire and life safety (2008).

In 2006, retrofit of sprinkler systems began, and 17 houses were outfitted. In the years since, all Wesleyan University-owned houses have been protected by automatic fire suppression systems, greatly improving the fire and life safety of Wesleyan students (2008).

Paul Calderwood reports that Tufts University, near Boston, adopted a similar code-compliance initiative following the death of one of their students in an off-campus fire (Calderwood, 2004). Calderwood says that this fire was especially tragic, because the fire broke out in an illegal apartment over a garage, where code enforcement personnel did not have the opportunity to inspect. Further, the apartment had grossly insufficient egress for the student to escape safely, and there was no working smoke alarm in the illegal occupancy.

The Tufts University fire official outlines a number of initiatives that can have a dramatic impact on student life safety. First, a collaborative effort should be undertaken by city officials, fire department company officers, and tenants in rental units. The city officials should work hard

to convey to property owners that illegal rental spaces, overcrowded apartments, and absence of required fire and life safety equipment will result in prosecution (2004). Fire department company officers should have an easy way to report serious safety violations that they observe while on emergency calls in these apartments, so that city code officials can follow up directly. Finally, the University or the municipal code enforcement authority should establish an on-line reporting tool where tenants can anonymously voice their concerns about alleged safety violations (§ 6).

Enforcement is only one part of the puzzle, according to Calderwood, and there is a need for colleges and universities to educate students on fire and life safety principles. Tufts University annually conducts a life safety seminar for all incoming freshmen titled *The Operation Awareness Program* (Calderwood, 2004). During this presentation, officials from the Tufts university Fire Marshal's office educate students on fire and life safety principles and habits, and they are issued a booklet of university fire safety policies and guidelines, which are reviewed during the presentation (§ 14). Also, students are provided with a comprehensive off-campus housing checklist that identifies dozens of important safety features for the students to investigate before choosing an apartment (§ 14). Calderwood stresses the importance of creating a student mindset of preparedness, as emergencies such as home fires can happen without warning. Personal responsibility is an important factor to stress, according to Calderwood, because "Being prepared also means that they cannot put themselves at risk by ignoring the lessons that have cost other students their lives, such as disabling the fire detection systems. Smoke detectors will save their lives only if they are working" (§ 20).

Ronald Kanterman and Frank D'Amore, Jr., prefer an educational approach to reducing the risk of fatal fire injury among college students in off-campus housing (2001). They believe

that fire protection technology is not necessarily the ultimate difference-maker in fire prevention, because it is human behavior that is the greatest contributing factor in fatal fires (§ 1). While statistics indicate the high likelihood that fire will negatively impact each American twice during their lifetime, almost no one truly believes it will happen to them. According to the authors, this defines an ill-informed culture (§ 2).

Following the Seton Hall fire, Merck Emergency Services in Rahway, New Jersey, developed a comprehensive educational program aimed at educating college students and prospective college students (2001). The authors state lament the irony that most grade school children possess a strong knowledge base regarding what to do in the event of a fire, but adults cannot – likely because they have either forgotten with age, or because they have grown indifferent (§ 5).

In most places throughout the country, fire safety education ceases at around the sixth-grade level (2001). Kanterman and D'Amore, Jr. believe that the American fire service is missing an important opportunity to reduce fire deaths in all age groups by establishing educational initiatives that should continue through high school and into college (2001).

As defined in the literature review, Merck Emergency Services developed a program called *Student Emergencies in Life and Fire or S.E.L.F.* (2001). The program is designed to educate high school juniors and seniors, and their parents, about fire safety in collegiate housing. The course consists of lectures by fire department public education officials, fire safety videos, power point presentations, and hands-on demonstrations (2001). During the course of the program, students are taught about fire growth and behavior, the physiological effects of fire and fire gasses, the importance of selecting housing with fire protection features, and the importance of reacting quickly and consistently when fire alarms sound (p. 3). Instructors also cover proper

use of a fire extinguisher, and review case studies of fatal fires, to include causal and contributing factors. Finally, students are asked to participate in a blind-folded disorientation drill, designed to make all of the subject matter personal and relevant (p.4).

Finally, the students are given handouts with detailed information regarding how to respond if a fire alarm sounds, how to preplan multiple escape routes and practice them, and tips for maintaining a safe building, even during times when a student might host a social function in their residence (p. 6).

University of Colorado and the Boulder Fire Department formed one of the nation's first and most progressive partnerships designed to educate students about fire and life safety. Sherry Kenyon, the Boulder Fire Department's Fire safety Education Coordinator believes that education should be the ultimate consideration when the goal is to reduce the incidences of fire and fatal fire injuries, because behavior is the key contributing factor in fires (personal communication, 2005).

Many fires can be prevented by education that intends to change behavior, according to Kenyon, and by extension many fire fatalities are also preventable. "Careless disposal of cigarettes is a behavior, leaving cooking or candles unattended is a behavior, and that can be changed," according to Kenyon (2005). "But disabling smoke detectors, putting rugs on extension cords, and choosing to rent unsafe apartments are also behaviors, and these are behaviors that students can change if we teach them how" (2005).

To achieve that goal, Boulder Fire partnered with University of Colorado to create a national-model fire safety program that has multiple initiatives. While their educational partnership has many profitable components, there are three initiatives that have had a particular

impact in reducing off-campus fires, according to Sherry Kenyon, the Boulder Fire Department Fire Safety Education Coordinator (2005).

The crown jewel of the University of Colorado fire safety education program is the RA Fire Academy, where Resident Advisors, the floor managers in the CU residence halls, spend two days with University administrators, residence hall directors, and fire department personnel learning about a wide range of topics (S. Kenyon, personal communication, August 25, 2005). Much of the curriculum covered deals with residence hall policy related to fire safety, fire drills, sanctions for violating policies and the RA's role in reporting, case studies of collegiate fire fatalities, and several hands-on evolutions with Boulder Fire Department personnel. These drills include fire extinguisher training, turn-out drills, and disorientation and escape drills in residence hall occupancies that are filled with theatrical smoke (2005). The University has devised curriculum and established social events that enable the RA's to return to their floors and deliver fire safety education to all students in the residence halls. Because of this, all students living in residence halls are subjected to a similar fire safety message that will stay with them when they move to off-campus housing.

The Boulder Fire Department and University of Colorado also reaches the entire student body by mailing pamphlets of information to them prior to the beginning of each school year. The pamphlets, intended for both student and parents, carefully detail CU's policies and procedures related to fire safety in the residence halls, the disciplinary measures for infractions, and advise them of what products and appliances are allowed by the school's fire safety standards. Also, students are mailed checklists, prepared by Boulder Fire, to use while selecting off-campus housing. The list defines responsibilities for both the renter and the landlord, and contains some of the following questions for students to ask.

1. Is this a licensed rental unit?
2. Does the apartment have a working smoke alarm?
3. Is the kitchen equipped with a fire extinguisher?
4. Is the furnace inspected every year?
5. Will I change the battery in my smoke detector when it chirps?
6. Will I blow out candles before I leave the room or fall asleep?
7. Will I remember to check for smoldering or burning trash after a party?
8. Will I always evacuate for a fire alarm?

A recent development that Kenyon says has generated a very positive response among college students is the implementation of the Leadership Academy (personal communication, March 1, 2011). The Boulder Fire Department hosts a day-long fire academy for 28 student leaders from Greek organizations, student government, and other campus leadership organizations (2011). An internet press release states that the students perform a day of activities as a fire company, and are subjected to simulated emergencies that require teamwork and cooperation to mitigate. Alongside Boulder firefighters, the students hook fire hydrants, advance attack lines, perform high-rise evacuation evolutions, and perform the search for and rescue of a mannequin while wearing full firefighter PPE in a zero-visibility environment (City of Boulder, 2010).

Kenyon informed the researcher that admission to the academy was purposefully made very competitive, to guarantee that student leaders in attendance had demonstrated a strong desire to attend (personal communication, 2011). Applicants are required to answer a questionnaire that defines their desire and qualifications to be chosen for the academy, with an attached personal essay highlighting the student's leadership accomplishments, motivation to

attend the training, and plan to educate members of the CU student body. Upon completion, Kenyon requires that the students present a comprehensive fire-safety class to their organization(s), after which a ceremony is held to award them a certificate of completion (2011). Kenyon states that the competitiveness of program admission and training alongside the firefighters has caused the program to become a leading educational initiative on the University of Colorado campus (2011).

A comprehensive review of available literature, the researcher's attendance at the 2005 Boulder symposium, and personal communication with Sherry Kenyon clearly identified that other organizations employ varied initiatives to provide for the fire safety of college students.

Overwhelmingly, however, those initiatives fall into three major categories: (a) engineering, (b) enforcement, and (c) education.

Engineering initiatives, like the one at Wesleyan University, seek to promote fire and life safety in off-campus housing by installing those fire protection systems that are most likely to save lives in case of fire. Enforcement initiatives, like the ones described by Calderwood, seek to promote student safety by strictly enforcing existing codes, as well as identifying and dealing with problem and illegal occupancies. Also, fire department response personnel and students should be treated as assets, and systems to allow easy reporting by these members of safety concerns can allow them to effectively serve as eyes and ears of housing inspection divisions.

Finally, the value of the educational component cannot be overstated. It is true that poor habits and dangerous behaviors can, both deliberately and unknowingly, significantly contribute to the risk of fatal fires in off-campus housing. Progressive and effective educational programs, like the ones developed by Merck Emergency Services and the Boulder Fire Department, are the most likely way to transform a standard of poor behavior into a safety-savvy base of knowledge.

In summary, the answer to the second research question is that other organizations have utilized fire protection engineering required by fire and building codes, prioritized enforcement of those codes and other local standards, and employed educational initiatives to create students with fire-safe habits and increased levels of fire prevention knowledge.

The literature review and three separate interviews answered the third research question. The interviews were conducted with ICFD Fire Marshal John Grier, City of Iowa City Senior Housing Inspector Stan Laverman, and University of Iowa Assistant Director of Housing Kate Fitzgerald. Answers to the first two research questions also provided significant insight into the third research question.

3. What methods should the Iowa City Fire Department utilize to reduce the risk among University of Iowa students living in off-campus housing?

Research associated with the first two research questions revealed that three categorical imperatives for addressing the problem of college students losing their lives in off-campus fires are (a) engineering (Ahrens, September 2009, March 2010, September 2010; Comeau, 2008), (b) enforcement (Calderwood, 2004), and (c) education ((Kanterman & D'Amore, Jr., 2001; The People's Burn Foundation of Indiana and Campus Firewatch, 2007; Bruno, 2008, and Kenyon, 2005).

A gap analysis is defined by the Business Dictionary in the following way:

Technique for determining the steps to be taken in moving from a current state to a desired future state. It begins with (1) listing of characteristic factors (such as attributes, competencies, and performance levels) of the present situation (what is), (2) cross-lists factors required to achieve the future objectives (what should be), and then (3) highlights the gaps that exist and need to be filled.

A justifiable and objective approach to determining the answer to the third research question would be to compare the core areas and model initiatives identified by the research with current ICFD and University of Iowa initiatives, in order to determine what must be done to address the problem.

*Engineering.* The State of Iowa, which governs regent's institutions like the University of Iowa, has adopted the 2009 edition of the International Fire Code (State of Iowa Administrative Code, 2010), as has the City of Iowa City, where UI is located (Iowa City City Code, 2010). Every UI residence hall is equipped with modern fire detection, fire protection, and fire suppression systems (K. Fitzgerald, personal communication, February 15, 2011) and all new residential occupancies, to include any residential space, is built to the strictest standards of the 2009 International Building Codes (S. Laverman, personal communication, February 15, 2011), which requires model requirements for fire-rated building components and fire separation, as well as fire detection, fire protection, and fire suppression systems (IBC, 2009).

Fitzgerald states that university managed housing is very safe because of the level of protection these systems provide (personal communication, 2011). Laverman makes the same assertion about the newer rental occupancies off-campus, because the city has required them all to be built in accordance with modern codes.

Newer buildings, because of the engineered protections systems, don't tend to represent as much of a risk to college students as older occupancies, according to the Iowa City Fire Marshal (J. Grier, personal communication, February 17, 2011). Fire Marshal Grier states that older residential occupancies represent broad fire-safety challenges because there is a wide line of demarcation between how they are used now and how they were built to be used (2011). Grier (2011) and Laverman (personal communication, February 15, 2011) agree that many of

these structures were built and intended to be used as single-family homes, but they have been significantly modified into multi-unit, multi-family occupancies. Grier characterizes the specific risks in these occupancies as being unkempt, having overloaded electrical systems, and they lack both automatic sprinklers and monitored alarm systems (2011). Laverman concurs, identifying the lack of fire separation, sprinklers systems, and advanced alarm systems as key hazards in Iowa City's older rental occupancies (2011). Ed Comeau, a strong advocate of sprinklers in off-campus collegiate housing, concurs with the findings of both Laverman and Grier by saying that a key problem is that sprinkler systems are not being installed in these off-campus occupancies (Bruno, 2009).

When asked what local code amendments contributed to student safety in off-campus housing, Laverman pointed to an amendment that requires any rental unit to have working and approved smoke detectors installed in every bedroom, in every hallway, in every common area, and on every floor. Laverman believes this requirement to be a significant one because it is one of the fire safety amendments that applies all rental units, regardless of age, and it at least provides a measure of fire protection in the older housing stock, which he believes to be the most dangerous (personal communication, February 15, 2011).

Fire Marshal Grier was asked if building and fire codes in Iowa City require a level of fire-safety engineering that is adequate to protect college students living in off-campus housing. He responded by saying that new and newer buildings are adequately protected largely because of the fire-protection engineering requirements (personal communication, 2011). Grier states that all new and newer rental occupancies in Iowa City have remotely-monitored alarm systems, and they have a high-level of protection provided by NFPA 13-compliant sprinkler systems (2011).

Related to the engineering component, Grier defines the key shortcoming to be the lack of political will to implement sprinkler requirements in one-and-two family homes (personal communication, 2011). Grier believes that older construction is not as safe as newer, primarily because the engineering protections are not present (2011). Grier points out that because of the political problems associated with increasing code requirements in older housing, it is necessary for the fire department to educate students and parents to choose off-campus housing that is equipped with automated fire protection systems (2011).

*Enforcement.* Paul Calderwood believes that an effective enforcement component is critical in mitigating off-campus fire deaths (2004). He believes that inspections of rental occupancies, performed frequently and by a task force of qualified professionals from all disciplines will yield positive results causing fire hazards to be identified and rectified (2004). Bruno agrees, stating that “the local fire department has full responsibility to provide protection, which should include the power to inspect premises and order corrections of code violations” (2009, ¶ 7).

Stan Laverman, the Senior Housing Inspector in Iowa City, places the creation of his department in the early 1970’s, and states that the overriding goal of all department members since has been to accomplish continuous quality improvement of enforcement measures (personal communication, February 15, 2011). Laverman believes that the dedication to progressive enforcement measures has had a positive impact on the safety of all residents, to include college students living in off-campus rentals (2011). The adoption of model codes like the IBC and associated local amendments allow experienced housing inspectors to enforce a standard that is explicitly designed to increase the safety of building occupants. Further, according to Laverman, the inspection rotation guarantees that a certified inspector will

conduct a thorough and progressive inspection of every room in every rental occupancy biennially (2011).

Laverman is largely pleased with enforcement measures in Iowa City, and claims that local property owners generally work very quickly to rectify any code violations scheduled for re-inspection (personal communication). The Housing Inspection Services division in Iowa City is also on the cutting-edge of limiting over-crowding and non-licensed occupancies in illegal spaces, according to Laverman (2011). Because of the significant hazard represented by these violations, Laverman's division and the City of Iowa City Internet Technology Services have partnered to create programs and databases that monitor advertising mediums such as craigslist and utility company billing databases.

Laverman says that these programs automatically monitor online advertisements and compare advertised leases with zoning occupancy restrictions, in order to identify cases where property owners attempt to over-rent, or overcrowd a rental space. Similarly, technology is used to cross-reference names on utility accounts with the names of property owners. Primarily in the case of one-and-two family homes, this investigation tool can be used to identify rooms and houses that are being rented illegally and therefore not subject to inspection (personal communication). These initiatives are very successful, according to Laverman, with his division identifying more than 100 unsafe and illegal occupancies every year (2011). According to Laverman, "we have a pretty progressive and reliable system that will only get better as we build our database and refine our investigative techniques" (personal communication).

An analysis of best practices revealed in the research and those practices currently employed by the City of Iowa City reveal that enforcement initiatives are considered to be

adequate. The City of Iowa City Housing Inspection Services, however, is already utilizing technology and web-based applications to assist their investigation and enforcement services. The research reveals that no web-based reporting solution exists to allow either fire department responders or concerned tenants to quickly and effortlessly report safety concerns, as recommended by Calderwood (2004).

*Education.* The research reveals that many experts support the use of fire-safety and fire prevention education as the key factor in reducing off-campus fire fatalities (Bruno, 2008; Comeau, 2007; Kanterman & D'Amore, Jr., 2001).

The Iowa City Fire Department and the University of Iowa have already formed a strategic partnership dedicated to fire-safety and fire prevention education. Kate Fitzgerald, Assistant Director of University Housing, believes that the most profitable endeavor to date is the Resident Advisor (RA) Fire Academy (personal communication, February 15, 2011). This endeavor was first conducted in the Fall of 2006 and modeled after the RA Fire Academy at the University of Colorado.

During the RA Fire Academy, residence hall student-leaders learn fire safety tips, receive lectures from fire department education professionals and watch college-student specific video presentations prepared by student advocacy groups. Also, students do pre-tests and post-tests to determine their fire-safety knowledge base, conduct case studies of fatal fires in collegiate housing, and finally participate an evacuation drill in a floor of a residence hall that has been filled with theatrical smoke.

According to Fitzgerald, prior to the RA Academy, her students spent an hour during orientation covering fire safety. She believes that the entire day of hands-on important fire training offered by the RA Fire Academy truly educates the student managers and equips them

to carry a fire safety message back to the students who live on their residence hall floors (personal communication, February 15, 2011).

Fitzgerald also references a mock room burn that the ICFD does an important campus-wide educational initiative (personal communication). Fire crews build two identical, furnished residence hall rooms. The rooms are located next to each other in the college green, and one is equipped with a single sprinkler head, while the other remains unprotected. Crews then start small fires in each room's trashcan, and the rooms are allowed to burn. The large crowd of students who witness this event will see that (a) the unprotected room will quickly become completely engulfed, and (b) the sprinkler head in the protected room will either control or extinguish the incipient fire. Fitzgerald believes that this is a popular and effective educational tool (2011). University officials have, in fact, discussed how to more effectively market the tool, to include requiring all Greek students to attend, and creating a documentary on University of Iowa TV (2011).

Students receive adequate briefing regarding fire safety in the residence halls, according to Fitzgerald (personal communication, February 15, 2011). During orientation they attend a seminar of UI fire-safety policy, where candles, cooking, appliance, alarm systems, and safe and unsafe behavior are discussed (2011). When students check into residence halls, they are officially issued the residence hall policies related to fire safety. During their first week on campus, they are required to attend a class with their RA, where educational elements of the RA Fire Academy are conveyed. Following those meetings, fire drills and fire drill debriefings are conducted by UI and ICFD staff. In total, according to Fitzgerald, on-campus residents are formally exposed to fire-safety messages 6 times in their first 14 days on campus (personal communication February 15, 2011).

Despite fire-safety educational endeavors by UI and the ICFD, Fire Marshal Grier (personal communication, February 15, 2011) believes that students are largely unprepared for fire-safe living when they move off campus, because the ICFD is currently only able to share educational opportunities with a very small percentage of students. Fitzgerald agrees with the premise, and states that student apathy may play a contributing role (personal communication, February 15, 2011). She believes largely that students living in residence halls take fire protections systems and fire safety policies for granted, and that when they look for off-campus housing they are distracted by matters of location, comfort, and convenience, rather than fire safety (2011).

Director Fitzgerald believes that there currently exists a rare opportunity to grow the ICFD and UI fire safety partnership to include other programs and initiatives (personal communication, February 15, 2011). The time to institute a higher degree of educational exposure, according to Fitzgerald, is when a student chooses to live off-campus (2011). She states that students must declare to the university, prior to a semester, whether they plan to live on or off campus. The time that they declare for off-campus housing would be the ideal time to institute an online educational requirement. Already the UI has required online courses for binge drinking and sexual assault, and she claims that they are very successful (2011). She believes that the UI Vice President of Student Services would be very willing to explore collaborations that reach more students.

The research has revealed that the Iowa City Fire Department should reduce fire risk in off-campus collegiate housing by (a) promoting and increasing fire-safety engineering, particularly fire detection and fire suppression systems, (b) exploring new initiatives in code enforcement, particularly with regards to online reporting for fire department officers and

concerned tenants, and (c) approaching UI administration with ideas for both growing the ICFD / UI fire-safety partnership and increasing fire safety and fire prevention educational efforts.

## Discussion

The results of this applied research project are directly attributed to information gathered through a comprehensive literature review process and personal interviews with experts from a Big Ten University, the Fire Marshal of Iowa City, and the City of Iowa City's expert on residential housing inspection and code enforcement. Results of the personal interview with Fire Marshal John Grier are recorded in Appendix A, while the results of personal interviews with Senior Housing Inspector Stan Laverman and Assistant Director of University of Iowa Housing are located in Appendices B and C, respectively. The model for community risk-reduction, referenced extensively in National Fire Academy Risk reduction curriculum and used to formulate interview questions is located in Appendix D.

The findings revealed by these research undertakings identified several significant findings related to the research problem. The problem that formulates the basis of this research is that the Iowa City Fire Department responds to a significant number of fires that occur in off-campus collegiate housing. The problem is confirmed by the researcher's experience as a company officer responding to emergencies in Iowa City, as well as Fire Marshal Grier's contention that many of Iowa City's fires occur in occupancies that may be defined as off-campus housing (personal communication, February 17, 2011).

The purpose of the research is to determine methodologies that the ICFD may use to reduce the risk of death, injury, and property loss due to fire among college students residing in

off-campus housing. The research revealed 3 findings of particular interest to the researcher, namely that (a) the greatest majority of students who die in fires die in residential structure fires in occupancies off-campus, and nearly every important statistic in this group mirrors the those found in an analysis of the national fire problem, (b) off-campus housing, particularly in Iowa City, may be defined as nearly any residential occupancy located within 2 miles of the main campus, and (c) the major initiatives that should be undertaken to reduce the problem must focus on fire-protection engineering, code enforcement, and education.

Of great interest to the researcher is the fact that the fire-fatality problem among college student mirrors the fire-fatality problem nationally. The NFPA reports that in 2009, 85% of America's 3,010 fire fatalities occurred in residential occupancies (Ahrens, 2010) while Campus Firewatch reported in 2010 that 85% of all collegiate fire fatalities occur in residential structure fires. The NFPA also reports that in 2009, 63% national fire fatalities occurred in homes that either had no smoke detector or had a smoke detector that had been disabled (Ahrens, 2010). By the same token, the People's Burn Foundation identified missing or disabled smoke detectors as one of the leading contributing factors in fatal off-campus fires (2007). Similarly, both organizations have identified that fatal fires rarely occur in residential occupancies with automatic fire sprinkler systems.

While the Iowa City Fire Department maintains a modern database of emergency incident information, shortcomings in data input make it nearly impossible to identify specific occurrences of fire in off-campus housing. USA Today, in a study published January 24, 2006, stated that 76% of students who die in off-campus structure fires do so in residences that are

within a 2-mile radius of campuses, while 73% of fatalities occur within 1-mile (Davis & DeBarros, 2006).

Iowa City is geographically defined by the central University of Iowa campus in its center, surrounded by high-density residential housing that transitions in all directions to residential neighborhoods. University of Iowa data reveals that the University of Iowa, in fall 2010, UI experienced its largest-ever enrollment of 30,825 students (University of Iowa, 2010). Director Fitzgerald reports that University of Iowa residence halls have 5800 beds, and operate at capacity (personal communication, February 15, 2011). City of Iowa City housing data reflects that rental properties in the city make available 33,178 bedrooms in 16,795 housing units (Laverman, 2011). A comparison of this data leads this researcher to conclude that 5800 college students live in university housing, leaving 25,025 students to choose campus housing from the stock of 33,178 available rental bedrooms. While it is likely an invalid assumption that all 25,025 of those students live in Iowa City rental properties, it can anecdotally be assumed that the vast majority of rental occupancies in Iowa City house college students. Therefore, the contention by USA Today that most student fatalities die within two miles of campus is validated for Iowa City, and it may be assumed that almost all fires that occur in rental occupancies affect college students. This more clearly defines the problem for the Iowa City Fire Department, as it identifies many of the city's citizens and residential occupancies as being at risk.

The third significant finding of the research focused on three particular areas where risk-reduction initiatives should be focused – engineering, enforcement, and education.

Fire protection engineering is the first of three key components revealed in this finding. Because Iowa City has adopted the 2009 editions of the International Building, fire and

Residential Codes (Iowa City City Code, 2010), building and operation requirements for all new and newer off-campus housing are deemed to be appropriate (J. Grier, personal communication, February 17, 2011). Iowa City has, however, amended out the code requirement for residential fire sprinklers due to a powerful opposition lobby (J. Grier, personal communication, February 17, 2011). The importance of fire sprinklers in residential occupancies revealed by the NFPA (Ahrens, 2010) and Comeau (2008), make it apparent that the Iowa City Fire Department must increase efforts to encourage council members to adopt the IRC standard for sprinklers.

The second of three key components was identified by the research to be enforcement of adopted codes. Laverman contends that initiatives undertaken by Iowa City's housing inspection department are progressive and appropriate, and that their level of expertise, inspection cycles, use of technology, and dedication to continuous improvement define Iowa City as having a model code enforcement program (S. Laverman, personal communication, February 15, 2011).

That dedication to continuous quality improvement may be augmented, however, by a recommendation of Paul Calderwood (2004). Calderwood states that fire department company officers, who respond to thousands of incidents in residential properties, can be utilized as extra eyes and ears for housing code officials (§ 6). Calderwood contends that housing inspection departments should have an easy reporting system whereby fire department members can report on safety and code violations that they witness while on emergency calls. Similarly, an online and anonymous reporting system should be established to allow tenants a way to communicate concerns to housing inspection officials. Given the high volume of calls that ICFD members run, the significant risk identified by this research, and Laverman's willingness to use

technological initiatives to improve services (personal communication, February 15, 2011), the ICFD should consider advocating such a service.

The significant findings identified by this research are of high importance to ICFD risk-reduction efforts, because they more clearly define perhaps the most proliferate fire-fatality risk the community faces. Currently, fire prevention and education efforts are focused primarily on grade-school children, while very few are committed to college students, and none are dedicated to high school students transitioning to college.

Kanterman and D'Amore, Jr. believe that education is the key component the resolving the off-campus fire-fatality problem, even above those of engineering and enforcement (2001). They state that poor behaviors are the greatest contributor to fatal fires, and believe that this is primarily because they have been subjected to very little fire-safety education beyond the sixth grade.

This becomes the most significant finding of the research, because it defines how efforts may be focused to reduce the off-campus fire fatality risk while simultaneously realizing a reduction in the nationwide fire problem. Accordingly, the study published by the People's Burn Foundation and Campus Firewatch concludes that "the fire safety problem at our nation's campuses mirrors the fire safety problem throughout society. If we can address the campus fire safety problem, we will have a dramatic impact. . .in terms of fire safety across the nation as these students graduate and move onward" (2007, p. 3).

This is an emphatic truth for ICFD leaders to keep in mind when considering allocation of risk-reduction resources. The PBF study says that college students who value fire safety will become adults who value fire safety. Census data for Iowa City defines the municipality as one of the most educated cities in the nation, with nearly 60% of adult residents having a bachelor's

degree or higher (United States Census Bureau, 2000). This means that the best way to reach the citizenry of America, and of Iowa City, with important fire safety training is to engage college students. Over time, as college students graduate and become part of the community, it is likely that the off-campus fire-fatality problem and the fire-fatality problem across society's broader cross-section would simultaneously decline. In this researcher's opinion, this could be one of the most important educational initiatives ever undertaken by the fire service, and should be made the top priority for ICFD risk-reduction efforts.

The specific findings of the research reveal that the ICFD should immediately engage University of Iowa leadership and officially form a fire safety education committee, where important strategic initiatives might be considered. Fire Marshal Grier indicated that the IVFD would be very willing to act on findings of the research, and commit resources to where they might be most effective in reducing the risk of off-campus fire fatality (personal communication, February 17, 2011). Kate Fitzgerald states that the Vice President of Student Services at the University of Iowa is receptive to partnering on new educational initiatives, particularly related to large-group presentations like mock burns, and online educational opportunities for incoming students (personal communication, February 15, 2011).

Sherry Kenyon states that one of the most profitable new educational efforts at the University of Colorado is the Student Leadership Academy, a highly competitive and intensive fire training program that requires participants to educate fellow students (personal communication, March 1, 2011). Because resources at the ICFD and the University of Iowa are limited, partnership endeavors with student leadership groups, effectively training and enlisting students as fire safety instructors, should be adopted.

In summary, it is the researcher's opinion that the applied research has identified a clear and pressing need to establish engineering, enforcement, and particularly educational initiatives to reduce the risk of University of Iowa students being killed or injured in off-campus fires. It is further empirically established that efforts to reduce fire-fatality risk among college students will realize the collateral benefit of reducing the fire-fatality risk among the general population. These facts are in keeping with the Iowa City Fire Department's Mission Statement, which is *to protect our community by providing progressive, high-quality emergency and preventive services.*

It is the researcher's opinion that while the literature review and personal interviews were sufficient in scope, there are further concerns regarding the lack of comprehensive information regarding educational initiatives at other fire departments, colleges and universities. Cost-effective resource allocation is more important now than it has ever been, and the ICFD is faced with considerable fiscal challenges. This researcher's position in the Fire prevention Bureau has recently been eliminated, thereby eliminating the official that would be largely responsible for designing and implementing any educational programs, symposiums, or academies. It is noted by this researcher that further research is required to accurately identify the most effective and efficient ways that the ICFD could undertake fire safety educational programs for college students in general, and those living off-campus specifically.

### Recommendations

The problem is that the Iowa City Fire Department responds to a significant number of fires that occur in off-campus collegiate housing. While it is considered by the researcher that the Iowa City Fire Department has a progressive, modern fire department that places an

emphasis on fire prevention education, the research has revealed that the ICFD has not adequately addressed the community's largest at-risk group for fire fatalities – college students living in off-campus housing. It is the purpose of the research to determine methodologies that the ICFD may use to reduce the risk of death, injury and property loss due to fire among college students residing in off-campus collegiate housing.

The research presented in this applied research project confirmed that college students living in off-campus housing are a large at-risk group prone to experience fire-loss, injury or death as a result of a residential structure fire. The research concluded that measures promoting fire-safety engineering, fire and building code enforcement, and fire-safety education are the keys to addressing and reducing risk among this demographic.

The following recommendations are the result of exhaustive research related to fire fatalities in off-campus collegiate housing. They are respectfully submitted by the author as the foundation for a risk-reduction program that will achieve the goal of reducing the risk of fire death among college students in Iowa City, and realize a collateral benefit of reducing fire deaths among the general population of the city.

1. Convene a committee of fire department and fire prevention bureau leaders to consider the results of this applied research project.
2. The committee shall obtain support of senior leadership for creating new initiatives and forming a formal fire-safety education partnership with University of Iowa leadership.
3. The committee shall establish goals for a risk reduction program associated with off-campus fire safety.
4. The committee shall form a sub-committee to further research best practices of fire service organizations

5. The committee shall solicit a meeting with leaders from the University of Iowa Office of Student Life, with the purpose to formally present the findings of this research and recommendations for forming an exploratory partnership or task force.

6. The committee shall recommend to University of Iowa leaders that effective mediums for educational delivery be identified, with general recommendations for on-line learning, fall orientation lectures, and educational academies with hands-on components.

7. The committee shall consider partnering with University of Iowa Admissions to send educational mailings – particularly material that focuses on choosing fire-safe housing – to the home addresses of all incoming students.

8. The committee shall consider the feasibility of sending at least one committee member and at least one University official to Boulder, Colorado, to observe the *Leadership Fire Academy*.

9. The committee shall align the goals of an off-campus fire fatality risk reduction program with departmental strategic planning initiatives.

10. The committee and / or the ICFD / UI task force shall identify specific educational initiatives to be adopted.

11. The committee and / or the ICFD / UI task force shall establish a timeline for the design and pilot implementation of all educational initiatives.

12. The committee and / or the ICFD / UI task force shall develop an evaluation strategy for all educational initiatives.

13. The committee and / or the ICFD / UI task force shall modify risk-reduction initiatives as needed.

14. The ICFD Fire Marshal should identify a means within Firehouse incident reporting software to accurately record what fires occur in defined off-campus housing and how many college students are affected by each fire, so that accurate evaluations may be performed.

15. The committee shall consider making a presentation to the city council, using the findings of this research and the goals of a risk-reduction program to achieve the reinstatement of the eliminated captain's position in the Fire Prevention Bureau.

16. The committee shall make recommendations to Iowa City Internet Technology Services and Housing Inspection services to create a web-based violation reporting tool for both fire department members and housing tenants.

17. The committee shall explore and consider best practices for promoting the adoption of the residential sprinkler code requirement contained in the 2009 International Residential Code.

18. Implement the risk-reduction program.

Implementation of these recommendations will have a positive impact on the ability of the Iowa City Fire Department to fulfill its mission, and will also have a positive impact on the life safety of college students choosing to live in off-campus housing in Iowa City.

A final recommendation, while outside the researcher's scope of authority, is for some stakeholder organization like Campus Firewatch, the People's Burn Foundation, The United States Fire Administration, the National Fire Protection Association, or the Department of Education to consider development of a comprehensive database containing best-practice risk reduction strategies employed by fire departments, colleges, and universities. This research has identified the importance of reducing fire fatalities in off-campus housing, and its correlate on the national fire fatality problem is of high significance, particularly to the USFA's operational

objectives. A central point of data collection, or some comprehensive electronic database would be of great benefit to any risk-reduction leader hoping to impact this problem in their communities. It would also further EACRR's goal of developing leaders in comprehensive multi-hazard community risk reduction, researching best practices within the fire service, and preparing to respond to all hazards in an effort to reduce severity of potential threats and emergencies within the community.

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Appendix A

Personal Interview

February 17, 2011

John Grier, Fire Marshal

Iowa City Fire Department

Note: This appendix represents the content of a personal communication between the author and the interview subject. Results may not be reproduced without the expressed consent of the interview subject.

1. What percentage of fires in Iowa City involve college students?

Unfortunately, our records management software system does not allow us to track that data. Rather, I am certain that the system has some capability that would allow us to track fires that involve college students, but to date we have not sought to collect that data set.

Your question, though, hints at something that I think is a bigger problem than just fires involving current college students, and that is what percentage of fires in Iowa City involve someone who either is or once was a college student? If we were to begin tracking some related data set, I would like to see us capture the bigger picture. I think the Department of Education has reported that up to 70% of American adults have attended some amount of secondary school. Here in Iowa City, more than 70% of residents over age 25 have at least a Bachelor's Degree. There is a huge educational component here that we are not necessarily taking advantage of on a local or national scale, and that is the number of people who we have had the opportunity to educate while in the secondary education system. American college students eventually become

citizens and home-owners. If we want to impact the fire problem in the greater population, I think an ideal place to start would be with the college population.

With all of that said, I think the best answer I can give to your question is that a majority of fire incidents in this city involves someone who either is a college student, or was a college student at one time. Unfortunately we just don't have the refined data to look at.

2. What are the leading causal factors of fires in Iowa City that involve college students living in off-campus housing?

The causal factors in Iowa City are consistent with the national trends. We haven't yet broken down the structure fire data in Iowa City to account for causal factors in fires that involve off-campus collegiate housing and residential housing in general, but national data indicates that the causal factors are nearly identical between the two groups, and my experience tells me that holds true here in Iowa City. Unattended cooking is the leading fire cause, and careless disposal of smoking material continues to be a significant fire cause in our community. The great majority of our fires are accidental as opposed to intentional, but our leading causes certainly indicate that the root causes are related to behaviors that can be changed. It is also significant to note that a contributing factor to many fires is alcohol intoxication, as the consumption of alcohol adversely impacts awareness, lowers inhibition, impedes judgment and slows down reaction time.

3. In your experience, do more fires occur involving college students living on-campus or off-campus. Why?

The answer to that question is off-campus, by a landslide. There are many reasons. Students who live off-campus lack oversight, they are more prone to use poor judgment because of the excitement of living on their own for the first time, they have more freedom to do things that might contribute to an unsafe environment, and in this city, they generally live in a structure

that fewer engineered protection features. Also, students are more likely in off-campus housing to own things that are not allowed in residence halls because they are unsafe, such as candles, incense, unauthorized outlet adaptors and extension cords, portable space heaters, etcetera.

It is also significant to note that a contributing factor in many fires is alcohol intoxication, as the consumption of alcohol adversely impacts awareness, lowers inhibition, impedes judgment and slows down reaction time. In my many years as a company officer, I can say that – by far – the most frequently occurring hazard that I saw in off-campus housing was late-night cooking that had become unattended because the intoxicated occupant came home, put food on the stove, and then passed out. I certainly believe that most or all company officers would agree with me on that. I also believe, however, that these incidents have fallen sharply in just the past few months, after the local law was changed to allow only people 21 and over into bars. We have seen a dramatic decrease in intoxicated college students in the past months, and that has produced a decrease in the number of fire calls where alcohol intoxication was a contributing factor.

4. What level of involvement does the ICFD have with fire-safety education at the University of Iowa?

For the past few years, our involvement with fire-safety education at the University has primarily focused on a day-long campus fire academy for Resident Advisors (RA's), who are really the student-managers of the residence halls. We have, in recent years, attended the University of Iowa's annual Off-Campus Housing Fair, attempting to share some information that would help students to make both safe lifestyle choices in off-campus housing, and also help them choose housing that is fire safe. Our efforts have really been limited, though, because the housing fairs do not see good attendance at all – I think we average maybe 60 contacts per year – and we really only reach probably about 100 students when we do the RA Fire Academy in the

fall. I do not know the extent to which the RA's pass along their fire-safety learning experience to the student body. I think they have tried to do a good job on that, but it is something that I haven't been able to follow-up on. I'm sure we could do better, and we need to develop the right plan that reaches out to the students with an effective message and also allows us to overcome the hurdle of very limited resources.

5. In your opinion, are college students in Iowa City educated appropriately on fire-safety topics?

Unfortunately, I am sad to say that I don't think they are. I do think that the people we have contact with in educational settings are educated appropriately, due to the fact that we are equipped to share the appropriate knowledge that can be used to help the students keep themselves safe. What they do with that knowledge cannot be quantified, really, and unfortunately we currently only have contact with a very small percentage of the University of Iowa student population.

6. In your opinion, who is responsible for educating University of Iowa college students about fire-safety in off-campus housing?

I think it really has to be a three-pronged approach when you talk about that. First of all, there is a high-degree of personal responsibility that the college student bears. While a student cannot always be expected to make the appropriate decisions without a specific knowledge base, nationwide and locally we see a pattern of irresponsible behavior that should be able to be prevented with common sense – patterns like smoking in bed, cooking late at night while intoxicated, shooting fireworks and discharging fire extinguishers in the hallways of apartment buildings, a disabling smoke detectors should all be prevented if a college student could exercise some responsibility.

The University of Iowa obviously bears responsibility in helping to deliver messages of fire-safety and personal accountability, and the ICFD, as an organization, understands the problem and has the experts in the field of fire-safety public education, and we certainly have a responsibility and a desire to be involved in any conversation. Essentially, I think when we look at those groups we see the major stakeholders that share responsibility, and if we can engage all of the stakeholders, then we can have a positive impact on the problem.

7. Does the ICFD have resources available to develop and deliver new fire-safety initiatives for college students?

That's a good question. We will have for a few months, until the position eliminations for FY12 take effect. Unfortunately, we have so many other things going on in our department that we do not have the time or the resources to dedicate anyone to give this program the attention it deserves. I think our department will eventually get it done with a tram approach, but it will take much longer, and perhaps be less effective, than if we had a point-person who had a passion and a vision to help develop and deliver programs. We are certainly willing to dedicate time and money to this problem, but our limited personnel and financial resources continue to see both increased responsibility and increased scrutiny.

8. A review of case-studies reveals that most fires involving the fatality of college students living in off-campus housing occur in occupancies similar to those found in Iowa City. In your opinion, does the potential for an incident of this type exist in Iowa City?

The potential most definitely exists. There is a great deal of houses, particularly in the neighborhoods nearest campus, which began life in the 1800's and early 1900's as single-family homes. They present a wide-range of fire-safety challenges because they are no longer being used as intended – most have been chopped-up into multiple-unit, multi-family occupancies. So

they are being used in a way that isn't consistent with the original intent, and they were built long before any adequate codes were in place to protect the occupants. So the hazards we see in these are that they are often unkempt, their electrical systems – while sufficient for the loads of 60 years ago, can't keep pace with all of the electrical devices that kids bring to school now. They aren't sprinklered and don't have monitored alarm systems.

9. You have had considerable involvement with the residential fire-sprinkler debate in Iowa City. How do automatic fire sprinklers impact the incidents of fatal injuries sustained in residential fires?

Residential sprinklers are engineered for life-safety. Alarm systems – even advanced ones – seek primarily to alert occupants that there is a fire, but they don't provide a lot of assistance for a safe escape. Sprinklers do that – they afford a potential victim the opportunity to escape a fire without being seriously injured or killed. When someone's life is at risk, conservation of the property is a secondary concern, and so in life-safety situations we would rather see a person afforded the opportunity to escape a fire, and worry about everything else second.

I think the latest research released by the NFPA reveals that a person's chances of surviving a residential structure fire are nearly 90% greater if that fire occurs in a residential occupancy that has automatic fire sprinklers. I don't know of any other initiative that we could adopt that would immediately have that type of impact. We just have to find a way to get everyone on the same side when it comes to the sprinkler battle. We know that people don't die in fires that occur in sprinklered buildings. Our goal is to keep people from dying in fires. It only makes sense, then, that we turn to sprinklers as a major part of the solution.

10. In your opinion, do codes in Iowa City require a level of fire-safety engineering that is adequate to protect college students living in off-campus housing?

When you are talking about newer buildings, I would say most definitely they possess adequate fire-protection engineering. All of our new and newer rental buildings are required to have a remotely-monitored alarm system, and depending on the size of the structure they are required to be sprinkler-compliant with either NFPA 13 or NFPA 13R. NFPA 13 deals with occupancies that require full-protection, and in 13R there are a lot of concessions available to the property owner. Almost all of our newer buildings fall under NFPA 13, and so they have a much higher level of automatic sprinkler protection.

Existing construction is not as well protected, because our code does not require them to have the level of protection required in newer buildings. It does not mandate retrofits for alarm systems or sprinkler systems, except in cases where structural additions or significant modification of the structure occur. Because of the cost associated with those fire protection systems, most builders seem to be very aware of what sort of modification triggers those retrofit requirements, and they stay just on the other side of the line. And that is perfectly legal for them to do. A number of residential rental units meet the minimum requirement of the code, which again is perfectly legal.

I think because of the politics associated with increasing code standards in existing housing, it is incumbent on us to try to encourage college students – and their parents – that when looking for off-campus housing, they should look for those newer occupancies that have fire-protection systems.

Appendix B

Personal Interview

February 15, 2011

Stan Laverman, Senior Housing Inspector

Iowa City Housing Inspection Services

Note: This appendix represents the content of a personal communication between the author and the interview subject. Results may not be reproduced without the expressed consent of the interview subject.

1. What standards govern the fire safety of rental units in Iowa City?

There are two major codes that govern a rental unit – that is the building code under which the structure was built, and the Iowa City Housing Code. So, already when you talk about these structures, you're talking about places that aren't sprinklered, structures that don't have alarm systems. So there is kind of a graduated scale that as the properties you are looking at become newer, you have more advanced levels of building construction and fire-safe engineering that allows for the safety of the occupants, and that is because the codes that structures are built under are always evolving, and by relation the safety features are evolving, too. The Iowa City Housing Code doesn't really reach back and put some of those major safety features into existing housing. It does reach back and put smoke detectors in all bedrooms; because of the state fire code those smoke detectors, as they age-out, are becoming the dual-sensing type. But certainly the fire separation isn't there in older buildings, nor are fire alarm systems or fire sprinklers. So there are many instances where we are inspecting an existing rental unit, and we have to go back to the fire codes of the 1970's to see what was required of that structure when it was constructed.

And it gets really interesting, because you can see how the codes have evolved over time just by looking at the volumes. In the 1970's, all construction was governed by one volume that was relatively small. Now the codes have just grown and expanded to the point that there are volumes upon volumes, and they are much more complex.

2. Are there any local amendments that have a significant impact of fire safety in these units?

In my opinion, our local amendment that requires a specific size of fire extinguisher to be installed in each unit and inspected annually is a big thing for the safety of the residents. Obviously not all people know how to use a fire extinguisher appropriately, but it is one more piece that has been added that could increase the chances of a person to safely escape a fire and limit fire growth prior to the arrival of the fire department.

Also, the retroactive requirement for smoke detectors in all units, which is one of the few that we have that reaches back to any occupancy regardless of age, which is extremely important. That at least provides a minimal amount of notification for people living in the most dangerous structures.

3. What percentage of rental housing in Iowa City is protected by sprinklers?

That is very hard to say, because you are looking across a broad range of occupancies and a broad range of structure age. But that requirement took place within the last decade, so off the top of my head I would say that you could look at all rental housing that has been constructed during that time frame, and those are the units that are protected by sprinklers.

We have not really seen any property owners voluntarily retro-fit existing structures with sprinkler systems. Most of the sororities have, and that is huge. The fraternities have been a different story, and there has been considerably less success. Some have started a retro-fit, but

they get a stand-pipe in and run out of money, and the project stops and becomes stagnant. But for the most part, Iowa City has a great deal of older housing stock, especially the old single-family houses that have been converted to apartment units, and they are our most dangerous housing. And we aren't seeing any retro-fits in any of those units.

#### 4. How is a legal rental unit defined?

Well, the way we look at it is that it has a living area, a sleeping area, a cooking area. Our City code defines a legal dwelling unit as “and habitable room or group of adjoining habitable rooms located within a dwelling and form a single unit with facilities that are used or are intended to be used for living, sleeping, cooking, eating of meals, as established herein.” And then we get into a specific section of code that defines what the minimum structure standards are for all dwellings. It goes into health and safety, square footage, where you can have fuel-burning equipment.

I'll give you a copy of this City code, but there are so many things that I don't think kids would ever think about. A big one, in my mind for instance, is the spacing of electrical outlets so that people aren't stretching extension cords all over and overloading existing outlets, causing a fire hazard. I think that there is a huge potential for education there, because after a while you have seen so many frayed extension cords, cheap extension cords, and electrical outlets that are overloaded to frightening degree, and you talk to the kids about them, and they sort of give you the eyeball, and you come to understand that they don't believe at all that those cords and outlets represent a significant risk. People tend to think that we are imposing these rules because we are the enemy of fun, and they sometimes don't realize that we are doing it because we really do care, and there is plenty of information out there that proves that this situation has resulted in the death of people just like you, and we really want to prevent that.

5. What are common fire-safety violations that you see during inspections?

I would say that 5 years ago we most commonly saw a lot of light gauge extension cords, but now I think we are seeing a lot less of those violations. That is because power strips have become so cheap, and they do offer a small level of built-in safety.

Our biggest problem is that we see a lot of smoke alarms that are down. The good thing about having smoke alarms in the hallways, and on each level and in each bedroom is that we are getting to a point where we have so many smoke alarms in an apartment that at least one of them is going to work. So we will usually find at least one working smoke alarm in an apartment, but most are required to have four or five, and it isn't uncommon to see the majority of those disabled or taken down completely. Effective in 2008, we required these smoke alarms in all of these bedrooms and common areas in all rental properties, and so that was a retro-fit measure that was required of even existing housing.

We also saw a high failure rate among a particular brand of fire extinguisher. The plastic top Kiddes we were finding about 30 percent of them to fall below discharge pressures within two years, but we were able to identify that and have really been able to work through that with the property managers.

Our housing inspection program has been around since the early 1970's, and we have really worked on making continuous incremental improvement in our enforcement measures, and I think that has had a real impact on resident safety. We go into each of these living areas every two years, inspect it, and when violations exist we have them rectified and re-inspected within 30 days, typically. While I think we are doing a pretty thorough and progressive job, there are just some things that we can't monitor at all times, and the biggest of those is probably the smoke alarms. We can inspect an apartment building, make certain all of the alarms are installed and

functional, and the next time someone burns a pizza in the oven the alarms come down, the batteries come out, and they frequently aren't put back up until we inspect again. The good aspect is that everything in newer buildings are hard-wired, and in those we see many of them that are just unattached from their mounting bracket and hanging from the wires – presumably because the person trying to disable it couldn't figure out how to detach it from the wire harness. The good thing is that smoke detector is still functional. It is the battery-operated alarms in the older buildings that we see are frequently taken down completely, and those are the real problem.

6. Are there illegal apartments in Iowa City?

Absolutely. We have a couple of issues there that we have identified. Our biggest problem is the single-family homes – some people might rent a room in their home, while others have a home on the market and can't sell it, so they rent it. Still others exist where parents buy an investment property for their kids at college, and then rent it when the kids move on.

There is also an issue of occupancy classification. Landlords tend to look at occupancy limitations as the government seeking to limit their ability to make more money by over-occupying a room or building. We have instances where the occupancy limit is determined by the zoning designation and number of bedrooms, and I just think of a typical case that we ran across yesterday where a home had a rental occupancy limit of 3 due to the zoning designation. The home had three bedrooms and a storage room in the basement, without proper egress, that was being used as a non-conforming bedroom. The landlord's message for the tenants was that all four could live there and all four could pay rent, but only 3 of them could have their names on the lease so that the over-occupancy wouldn't be noticed by our department.

7. How is your department able to identify and control the number of illegal apartments in Iowa City?

We do a pretty good job – we identified well more than 100 unsafe and illegal over-occupancy issues in single-family homes last year alone. Everything is online now, and we use the internet as our friend. We have a nice program set-up that allows us to monitor Craig’s List for landlords that are seeking to rent a unit to more people than what is allowed. We also have access to utility records, as far as who is the responsible party and who is paying for utilities, and that allows many opportunities to identify housing that is being rented illegally. We also have a history of certain occupancies and certain landlords that try to violate the occupancy requirements, and we know that is a certain landlord has a history of trying to cram 12 renters into a space that allows only 6, then we check-up on that pretty frequently. We have a pretty progressive and reliable system that will only get better as we build our database and refine our investigative techniques.

8. Is the attitude of property owners toward fire safety a positive one, or a negative one?

I am pretty pleased with the majority of property owners in Iowa City. We have a specific individual that owns a great many of the much older housing stock, and he is very conscientious. In fact, we have found that he tends to try to write more of the violations than we do. He has a great deal of personal responsibility when it comes to codes and safety measures, and we know that he will not short-cut anything, nor will he allow an unsafe situation to exist in his buildings. We have some of the major property-holding companies in Iowa City that are very responsible when it comes to building and planning for safety, and they maintain their properties in accordance with the strictest codes, and we know that kids that choose to live in those properties are choosing to live in a place that was safe.

We have had some owners in the past that grumbled and tried to push back, but even that has begun to change. I just spoke yesterday with a long-time rental property owner in Iowa City,

and he said to me that a decade ago, he really wasn't concerned with safety in his buildings, and felt that code enforcement was an inconvenience to him that took away from his bottom line. But he shared with me how his attitude had changed, and that he realized both the liability and the responsibility that he bore, and that now he is a great advocate for helping to ensure safety and code compliance in his buildings. All of this, in my experience, is pretty typical for our community, and I think that it is somewhat atypical for similar communities.

9. You are sending your child off to college – what are your encouragements and warnings?

I have experience with this. I have had family members move here to attend the University, and I require that they go through me. We made sure that we narrowed down a list of apartments and chose one that was a little farther away from campus, but was fully-sprinklered and had a good alarm system, as well as other health and safety features. Safety features in these buildings are the highest priority, even over convenience and location.

Appendix C

Personal Interview

February 15, 2011

Kate Fitzgerald, Assistant Director

University of Iowa Housing

Note: This appendix represents the content of a personal communication between the author and the interview subject. Results may not be reproduced without the expressed consent of the interview subject.

1. As Assistant Director of University Housing, what programs fall under your supervision?

From the time a new student gets assigned to the residence halls and prepares to move in, to the time they move out, basically everything. I oversee programming for the students, both social and academic, I oversee the residence halls and their respective managers, I oversee the discipline process, as well as crisis management and roommate management, safety and security of the residence halls, and many other collateral programs.

2. This year, a record number of students enrolled at UI. How do you characterize the University's responsibility to ensure that they are kept safe while at UI, whether living on or off-campus?

I certainly think that if they are living in designed campus housing, or in housing that is off-campus and leased for our use – and we are doing more and more of that as our enrollment and our demand on housing continues to climb – there is definitely a high-level of responsibility on us to guarantee for the student a safe place to live that has working safety systems. That can

range from properly locking doors to fire alarm and fire sprinkler systems. I certainly think that in the case of Greek houses, even though they are privately owned, the university still has responsibility to guarantee or require the safety and security of the structure, simply because that fraternity or sorority would not exist but for the having the University's official recognition.

I think in the private rental properties that are used for off-campus housing, the University does not have any authority to mandate any requirements, but they certainly do have influence with state and local government. I think that they can use that influence to make certain that fire safety regulations are crafted in a certain way and that landlords are building and maintaining these properties in a certain way, and I think that the University should use its influence to make certain that these properties are as safe as they can be.

3. Is there any group of students required to live in the Residence Halls for any specific length of time?

Officially, no. There are some cases involving specific programs that are offered through the Center for the Talented and Gifted that have a program requirement for the students that are typically 16 and 17 years old where they are required to live in the residence halls for one year. But that's all, and that is a program requirement and not a University of Iowa requirement.

Some colleges and universities have a policy that certain underclassmen – typically freshmen, or freshmen and sophomores – must live in the residence halls. We do not have any such policy, but we do house 98% of the freshman class in the residence halls, so the policy isn't really needed, as we seem to get almost all of those students as a matter of their choice.

4. What is the capacity of UI Residence Halls?

We currently have 5800 beds in our residence halls and our residences that we rent off-campus, and we are currently running at full capacity. And all of those spaces have monitored

alarm systems, automatic sprinkler systems, and all of the building code requirements that would help to prevent fire problems.

5. What initiatives are currently in place to educate students on the dangers of fire? Are any new initiatives being considered?

We have a comprehensive body of rules and regulations in our guidebook, which is the document that we refer students to for everything that they might do or think of doing while they live in the residence halls. When students come here for orientation in the summer and fall, they all go through a session in the residence halls where we talk about fire safety and what our rules are regarding that. This covers candles, cooking, what appliances are allowed and what are not, safe and unsafe behavior, response to fire alarm systems, and a whole host of things related to fire safety. When they check in to the residence halls, they are issued a copy of the guidebook, which again addresses fire safety. In their first 24 hours of being an official resident on-campus, they are required to attend a policy meeting, where again fire safety is one of the major topics covered. In their first week of classes every campus resident must attend a floor meeting with their Resident Advisor, where again fire safety is stressed heavily. In their second week of campus, we have fire drills that are monitored and critiqued by the fire department. These drills are debriefed, and later there is a follow-up e-mail to each student detailing how they did during the drill, and again stressing expectations related to fire safety. So within that first impact, we formally address fire safety with each student six times before they have been on-campus for two weeks.

Another initiative that has had an important impact is the Resident Advisor Fire Academy, which the Iowa City Fire Department developed and helped to implement about five years ago. Prior to that, when our RA's were going through their week-long orientation, we spent

about an hour or two covering fire-safety topics. We now dedicate an entire day of hands-on, important fire training that really opens the eyes of our RA's and enables them to carry the fire safety message back to their students.

As far as new initiatives go, the mock-dorm room burn that the ICFD has recently implemented as a training tool has really been identified as an important educational tool. Now we are looking to move that to Hubbard Park in the middle of campus, so that we can expose all students to that, rather than just the RA's. Our Assistant Director for Greek Housing is also very excited about this as well, and hopes to require all fraternity and sorority members to attend this demonstration as well, and we have definitely talked about making this a much bigger deal in the coming fall. I think doing that so that all students can be exposed to that would be great, and then having University of Iowa TV document that so that we can get it up on the TV's around campus would be helpful.

6. In your experience, how have these educational initiatives impacted students' understanding of fire safety?

When I first started my position 8 years ago, and I reviewed policy violations, I know that we had at least one trash-room fire every year, as well as multiple incidents of people lighting the contents of bulletin boards on fire. It was about that time that we really started to emphasize our commitment to fire safety education and beefed-up our enforcement of the discipline programs. Since that time, we have had one trash room fire, and – knock on wood – we haven't had those incidents of bulletin board fliers being set on fire.

Also, 8 years ago I remember that we could not go one weekend without having a majority of our exit lights – either with them being disabled, damaged, or stolen – and through monitoring, education, and enforcement of our policies we have minimized that problem.

We also used to have a problem with residents discharging the fire extinguishers in the residence halls, but through enforcement of our policies and education we have also minimized that problem. I think that as we have done a better job of educating the RA's, and really stood behind our policies, we have empowered the RA's to efficiently and effectively address unsafe behavior when they see it, and I think that has made all the difference.

I think the only area of concern that we still have is students that like to hang things from the sprinkler heads, and some wind-up breaking them. When that happens, though, the entire residence hall becomes affected to some degree, and peer pressure then helps us to address the problem.

But the RA's are definitely the critical component here, and when I started the RA training process really had an inadequate focus on fire safety. Now that we have increased that training to a full day, and it is conducted by firefighters who can really make the education hit home from a completely different perspective. For instance, the training evolution that the ICFD conducts with the RA's where they have to escape the hallway that is completely filled with theatrical smoke, they have a very different and much more educational perspective on what happens if they are caught in a fire, and we have empowered them to want to be more proactive to prevent a fire, and also educated them on what to do if a fire occurs.

7. When students leave the residence halls for off-campus housing, do you think they have been adequately prepared to make informed decisions regarding fire safety?

No. I think that the students, because they are so well-taken care of here with fire alarm systems and pull-stations and sprinklers and bells and strobes that are guaranteed to activate, I don't think that our students really focus on it that much. I mean, we train them how to prevent fire, and enforce a whole host of rules to make the residence halls safer, and make certain that

they are trained what to do if the fire alarm sounds. But I don't think that your typical 19 or 20 year-old is going to go look for an off-campus apartment and ask the landlord about the fire-safety capabilities of the building. Having known that when we took over, through a rental-agreement, hundreds of units at the Lodge apartment complex, and found exit lights that had dead batteries that would not have activated in case of fire, and smoke alarms that were disabled so that they would not sound in case of fire, really opened our eyes. And it was us walking through these buildings with the ICFD Fire Marshal that revealed these existing problems, and led the management of the Lodge to fix those problems, not only in the buildings that we were going to rent, but also in the existing buildings that were under their control, and that are used primarily for rental to college students.

So I don't think that it is something that people think about. They live in a building that has fire safety equipment and they take it for granted, and when they move into another building they don't bother to check to see if it has that equipment.

8. In your opinion, what is the key to deliver the fire-safety message to students so that they understand it and appreciate it?

I think you have to bring it to them. So in an instance where the ICFD could do the burn of the mock dorm room, with one side being a dorm room that has a working sprinkler head and the other one that does not, if you could bring that to them and let them see it that would really make a difference.

I think of drawing from personal experience – for instance, a couple of years ago there were several arson fires in the same neighborhood, and one of the homes that was burned was occupied by a former RA, and his girlfriend was a current RA that lived in the residence halls happened to be in the house at the time of the fire. He went out to student groups and did some

talking about it, and she was part of the University Student Leadership group, and she went out and did some talking about it, and I think that making it real for some students is the key to getting through to them. I don't believe that the majority of students in off-campus housing even think about the fire escape plan for their house, or develop a contingency for how to get out of a room if it is on fire. The way that students describe off-campus housing to me, I think that there are probably a lot of non-conforming occupancies with non-conforming bedrooms that don't even have two exits. So I think that helping students think about that and develop plans, like when you are in elementary school and you have to go home and draw a map and make a plan and have a fire escape drill – I think that we have to share that perspective that will help encourage students to come up with a plan, because when your house is on fire and your room is filling with smoke, you don't have time to stop and develop a plan then. I think the whole University needs to do some more education in that area.

We also have to find ways to use new technology to deliver the message. If you make a You Tube video and can send it to their cell phones, they will watch it. So finding those real-life ways that educates on a perspective that they don't have, like video-taping a fire the next time a student apartment building catches fire, and that will help students be educated about it.

9. What rules does the UI require students to obey to keep residence halls fire-safe?

Those are spelled out in our student guidebook, but we have changed our discipline system over the years to make fire-related violations much more severe when it comes to punishment. If a student were to start a fire, they would be expelled from both the residence halls and the University. If you disable fire-safety equipment, you will be removed from the residence halls. Also, we have changed it so that any student that has violated any of our fire-safety rules – no matter how minor – comes to see me, and we have a very serious conversation about it. And

there is latitude for me to get creative – one of the last students that I spoke with regarding a fire safety violation had a father who was a firefighter. So I made it mandatory that the next time his parents were in Iowa City, the student and his father had to come talk to me together. And when I shared with the father what the student had done, and his father became very angry, and reacted in such a way by sharing instances from his personal experience where a similar prank had led to the deaths of innocent people, that the student had a totally different perspective, and I was confident that we would never again see a fire-safety violation out of that young man.

10. In your experience, what fire-safety rules are most commonly violated?

Dismantling or disabling the smoke detector is the most common violation, primarily because it interferes with the students' ability to smoke in their rooms illegally. Thankfully, all of our alarm systems in the dorms are being upgraded so that if a smoke alarm is disabled or removed, it will transmit an alarm signal that will allow us to investigate it immediately.

The other thing is decorations in the room. We have a constant fight with people that want to have a little bit of privacy, so they hang a blanket or a sheet around their bed for a partition, so I think it is bringing those sorts of things to their attention, and constantly reminding our RA's that when they are in these rooms visiting their students, that they have their eyes open for these sorts of violations for what could be a possible safety problem. It certainly isn't anything that the typical student would think about.

But we don't have a problem anymore with illegal appliances, we have upgraded all of the electrical systems to safely handle whatever the student brings from home, we don't have people playing with fire extinguishers anymore, and we have greatly reduced the amount of "false alarms" that we have in the residence halls, so the smaller number of alarms we have, the more likely the students are to take them seriously and evacuate the building without us having

to do a lot of follow-up and enforcement. So whenever we have a building where there are starting to be alarms either through behavior or through malicious pulling of the alarms, we get on that right-away to figure out what is causing that and how do we stop that, because those are the things that are going to cause people not to respond when there is a real fire.

11. In your experience, what student behaviors that are observed in the residence halls might be most likely to contribute to a fire incident in off-campus housing?

I think that unattended cooking is a big thing. Every fire that we have had in the Married Student Apartments since I have been here has been from unattended cooking. Also falling asleep with a candle, or incense, or a cigarette going, and that is coupled with the uncleanliness of putting your cigarette out, but not knowing where the ashes went, or if the cigarette is really out, or if the ashtray is going to topple over. So I think that careless behavior is the big thing.

Also, I don't know this for a fact when you are talking about the off-campus housing in Iowa City, but we used to have instances left and right where the electrical system wasn't able to handle all of the appliances the students were bringing in, because it was designed in a time that they didn't have that much stuff, and we were popping breakers all the time. I have to believe that, especially in some of these older houses, electrical fires can be problem because all of the things we have today are just overloading the capabilities of the electrical system.

12. In your opinion, what is the University of Iowa's attitude and capability for adding an formal education requirement for all incoming students?

I would almost think that the time we would want to do that is when a student makes the decision that they do not want to live on-campus. I feel like when they choose to live on-campus, they are getting a safety net from us already. So I think that whenever they choose to live off-campus that they would have to take a course. I also think that right now, because of the new

relationship between the University and the City of Iowa City in combating binge drinking, that the Vice President in charge of student services would be very receptive to something like that. We have an alcohol and sexual assault program on-line that students are required to complete when they register, and if they do not complete according to a timeline then they drop their registration. Whether we would take it to that extreme I don't know, but I do know that when you tell our students that they are required to do something, they comply quickly and voluntarily. For instance, even before we began to enforce the penalty on the alcohol and sexual assault class, we already had 84% compliance. So even if we did not attach a penalty, you would still have a high degree of compliance. And if you institute a culture change, you take an incoming class, and when we confirm whether or not people will be living on-campus, we would take all of the people choosing to live off-campus and require that they complete some sort of module. Then in 4 years you have covered all students, and then it is part of the University culture.

Appendix D

EACRR Community Risk –Reduction Model

