Regulatory Guidance of Incident Management/Command and Control Training for United States ARFF Departments

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Certification Statement

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Abstract

This action research project was designed to develop a regulatory document for the Federal Aviation Administration (FAA) in the delivery of initial and recurrent Incident Management/Command, and Control Training for the nation's five-hundred and twenty-four certificated ARFF Fire Departments. The problem that is identified by the research project is that while the nation's ARFF Departments possess adequate firefighting training benchmarks for personnel to complete on an initial and recurrent status, no current requirements exist for any training for officers who are placed into incident management roles at airport/aircraft-related incidents. The purpose of this project was to develop an end-user regulatory document that could be submitted to the FAA that could be adopted for ARFF departments to utilize in the training of their officer personnel. This document was developed by using other FAA related ARFF statutory documents along with information that were provided by officers at airports from around the country. The action research project answered three questions and consisted of 1. What do Airport Fire Departments in the United States do to educate and train ARFF Officers who may be placed into command and unit officer positions during an airport-related emergency or incident; 2. What training and education topics do current ARFF Chief's and Officers think would be beneficial in a regulatory document to train and educate their unit and command officers; and 3.What barriers would exist for ARFF departments to implement officer-related initial and recurrent related training within their departments and would a regulatory document aid in providing a framework in implementation. The research was conducted through an extensive literature review and a survey tool that asked fourteen questions. The final recommendation includes a ready-made, draft advisory circular that was submitted to the FAA for their approval and adoption for the US ARFF industry.

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Introduction

In the United States and around the world, airports are considered critical infrastructure and are vital fixtures to the communities they surround. Commercial (Certificated) airports are even more crucial to their communities as they are essential to passenger and cargo transportation to other parts of the world and, even with small airports, provide large economic impacts their regions. These economic impacts are often not visibly observed but do exist and are measurable to their communities. Airports also provide lifelines to the rest of the country and the world, especially in times of crisis when a natural or man-made disaster strikes an area surrounding the airport and the airport is utilized to bring in critical supplies and resources to help get the area functional again. According to the Bureau of Transportation Statistics, in 2018 there were 19,636 airports that comprised of certificated, public and private use and military airports in the United States (United States Department of Transportation, 2019) and each has at least a small impact in their communities. An emergency incident at an airport has the ability to disrupt service to the airport and may have economic impacts on the airport and the areas surrounding them if the airport is not reopened in a timely manner. Officers that serve in roles of command and unit positions in an Aircraft Rescue Firefighting (ARFF) Department must understand this and prepare themselves to not only mitigate the incident in a timely manner but work with other stakeholders to get the airport or part of the airport operational again. This is done by having highly trained and competent ARFF incident managers that understand the life cycle of the airport and its community.

Within the United States, certificated airports are required, at a minimum, to have fire and EMS services during air carrier operations as per 14 CFR Part 139 (Federal Aviation Administration, 2004). Certificated airports are defined as airports that comply with 14 CFR

Part 139 and split into five indexes and further divided into four classes. The five indexes delineate the minimum amount of fire protection that is available on each airport based on the longest length of the aircraft that has five or more daily departures of commercial passenger aircraft (Federal Aviation Administration, 2019) during air carrier operations (Federal Aviation Administration, 2004). In some instances, air carrier operations may mean that the airport is staffed 24-7 with personnel who provide full-time or part-time ARFF services but at a minimum is at least fifteen minutes before the first scheduled flight of the day and fifteen minutes after the last scheduled flight of the day. Fire protection and EMS services are based on the five indexes, with A being the lowest and E being the highest. Fire and EMS services at our nation's airports are the only federally mandated fire service in the country. As of May 2019, there are five hundred and twenty-four certificated airports in the United States (Federal Aviation Administration, 2019). On a national level, ARFF departments account for approximately 1.7% of the fire departments nationwide (National Fire Protection Association, 2019)[1]. Airports are also divided into four classes based on scheduled and unscheduled arrivals and departures of large (thirty or more seats) and small (ten to thirty seats) aircraft at a specific airport (Federal Aviation Administration, 2019). The classes of airports are important to the management of the airport as it details the number of requirements that an airport is required to comply with for its specific certification requirements.

Training and certification in both initial and recurrent training of ARFF firefighters come from 14 CFR Part 139 in section 319 (Federal Aviation Administration, 2004). This federal

[1] This percentage was taken by dividing the number of fire departments that NFPA recognized in 2017 and dividing that number from the certificated airports that are required to provide fire protection at an airport. This number did not take into an account of a municipal department that may provide fire protection to multiple airports in their jurisdiction such as Chicago or Houston or an Authority Department that is one department but has multiple airports such as the Metropolitan Washington Airports Authority (IAD and DCA) or the Port Authority of New York and New Jersey (TET, SWF, EWR, LGA and JFK).

mandate spells out the necessary training elements that each firefighter must carry out before they can be counted as minimum staffing (initially) and every twelve consecutive months (recurrently). Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5210-17C further dissects 14 CFR Part 139 and provides a much more comprehensive framework of what the training programs for ARFF departments must provide.

While the 14 CFR Part 139 and 150/5210-17C documents are comprehensive documents for ARFF departments and their respective training officials, one aspect that is not addressed in these documents is training and education for ARFF Officers in the form of incident management or command and control training (IM/CCT). Currently, there is no recommendation or training requirement for ARFF Officers[2] that are comprised of unit and/or command officers to complete initial or recurrent level training that better hones their skills to successfully lead and manage an incident that involves an aircraft or airport-related event. The problematic aspect of this fallacy is that an ARFF department could determine based on the language that officers do not have to comply with the basic firefighter training requirements as set for in the 150/5201-17C document based on their positions. Further compounding the problem is when off-airport resources join on-airport resources during an event or incident, and the expectation is that the incident management framework is expected to be seamless, which may or may not be the case depending on the relationship between the two parties and the technical skills knowledge of those working together.

[2] For purposes of this research, an ARFF officer is defined as any person who fills an officer role, either formally or informally within an incident management structure. Unit officers are defined in this research as anyone who is an officer on an apparatus and a command officer is defined as someone who fills the initial incident commander role and/or arrives and provides command level integration into the incident like a group or division supervisor, branch manager or command/general staff functions.

As firefighters' transition into unit and command officer roles, a much needed and vital skillset is the ability to initiate and sustain command and control frameworks to manage and lead the incident. Many incidents in the course of the United States Fire Service demonstrate this need, and with the current tools that exist with the incident command system (ICS) and the National Incident Management System (NIMS), officers are now able to quickly build out escalating incidents for the betterment of the responders on the scene and those that need help. When these frameworks are utilized, and on-scene personnel contains technical skills and knowledge in their personal toolboxes, a successful outcome and mitigation of the incident can be accomplished. Both the utilization of ICS structures and the technical knowledge and skills must be present in unison for this to take place with all stakeholders (fire and non-fire stakeholders) participating in their designated roles. This applied research project (ARP) will address the lack of requirements of IM/CCT that exists at our airports via regulatory mandates and provide a framework of a regulatory document that can be implemented and utilized by ARFF departments that operate at certificated (and non-certificated airports should they wish to use) airports.

On July 6th, 2013, Asiana Airlines flight 214, a Boeing 777 hit a sea wall while landing on Runway 28L at San Francisco International Airport. On this fateful day, three passengers out of the three-hundred and seven occupants were fatally injured in the crash with many others sustaining injuries. First responders from the San Francisco ARFF Division (a division of the San Francisco Fire Department) and surrounding mutual aid assets performed heroic measures that included fire extinguishment activities, conducted multiple rescues and established patient triage, treatment and transport within a short amount of time. These activities ultimately led to the low number of fatalities not being larger. While the investigation revealed many issues with

the parties involved in the incident, the National Transportation Safety Board (NTSB) revealed several problems with the response to the incident by the San Francisco Fire Department and the ARFF Division at San Francisco International Airport, most notably a lack of command and control structure to manage an incident of the this magnitude (National Transportation Safety Board, 2014).

Another significant incident with relevance to this research but without a direct tie to IM/CCT challenges took place in Philadelphia, Pennsylvania. On February 7th, 2006, United Parcel Service (UPS) flight 1307 landed at Philadelphia International Airport (its destination airport) with an onboard fire in the rear of the main deck cargo compartment of a DC-8 freighter aircraft (National Transportation Safety Board, 2007). During this emergency, all three crew members collectively and flawlessly worked to safely land the aircraft despite deteriorating smoke and fire conditions that worsened on final approach and misdirection from the air traffic controllers in the Philadelphia Air Traffic Control Tower on the landing runway (National Transportation Safety Board, 2007). The ARFF crews at Philadelphia International Airport fall under the umbrella of the Philadelphia Fire Department. One of the significant challenges that took place during this incident was the inability of the ARFF personnel and ancillary mutual aid assets from the Philadelphia Fire Department to make access to the aircraft and extinguish the fire in a timely manner, causing the aircraft to be destroyed. This delay in extinguishing the fire was primarily due to a lack of understanding basic aircraft familiarization of cargo aircraft, especially once off-site mutual aid resources arrived at the incident site. While it was not directly mentioned in the NTSB report, the incident depicts the need to not only have competent and skillful personnel at the task level but also qualified and knowledgeable incident commanders who are ARFF specifically trained. This includes if they are at the airport or if they

respond from off the airport property as part of a response area. The Philadelphia incident is also relevant to this research because it brought about change in the ARFF industry with respect to cargo aircraft and led to a stand-alone regulatory document (FAA AC 150/5210-23) that outlines driver/operator training qualifications for ARFF vehicles that are at airports. An IM/CCT regulatory document would live in the United States ARFF industry as a similar document.

For the last several decades, travel via aviation has continued to grow and is utilized by millions of people each day. Aviation travel is easier than ever to get from side of the world to the other in a short amount of time with the advances that have been made with the aircraft of today. In 2018, over one billion passengers flew on both domestic and foreign flights (Bureau of Transportation Statistics, 2019) in the United States from the five-hundred and twenty-four airports commercial airports. Travel via commercial aviation is widely considered to be the safest mode of mass transportation in the world, with relatively few numbers of significant accidents (Preske, 2017). While a tremendous amount of effort (from a multitude of responsible stakeholders) is put into ensuring that aviation is safe, accidents and incidents do occur, oftentimes requiring various assets of the emergency response systems to activate and become involved in the incident including fire/rescue and law enforcement agencies. During these incidents, collaboration and cooperation among a multitude of stakeholders are paramount for the successful conclusion of the incident and the restoration of society with respect to any transportation element[3], including air travel. As it was stated earlier with airports, transportation elements can be impactful for their regions, and after the aspects of life safety, incident stabilization, and property conservation are met, all eyes on society restoration are vital in getting people moving again. This can only happen if stakeholders are trained and educated in their

[3] A transportation element could include anything that operates over a highway such as busses or mass-transportation, a waterway such a ferry or ship or rail with passenger and/or freight pieces.

various transportation sections, but also if they work and regularly collaborate with the other stakeholders that interact within their respective networks.

The problem identified by this ARP is that the five-hundred and twenty-nine certificated airports within the United States do not have any statutory or regulatory guidance or requirement to conduct initial and recurrent IM/CCT for ARFF Unit and Command Officers. The purpose of this ARP is to identify critical elements that are needed for a regulatory document for ARFF Officers and ARFF Departments to uniformly enhance the skills for incident management/ command and control functions and draft a document for submission to the FAA.

While the management of an ARFF incident can be complex with many different facets to the operation, such as hazardous materials or mass-casualty components embedded into it, the opportunities to specifically train on them are few and far between. As it stands today, an airport is required to exercise its mandated Airport Emergency Plan (AEP) on an annual basis and is typically done in table-top setting and conduct a full-scale exercise once every three years. These requirements are not nearly enough to gain valuable experience and upkeep of skills in the management of an incident. Furthermore, no standardized curriculum or textbook in the United States exists to uniformly teach or provide information about specific IM/CCT as it relates to ARFF. The only textbook that contains any information about strategies and tactics of ARFF is the International Fire Service Training Association (IFSTA) 6th Edition *Aircraft Rescue and Firefighting* textbook (International Fire Service Training Association, 2015). The IFSTA 6th Edition (and the previous 5 editions) are widely considered to be the bible when it comes to ARFF instruction. The book, however, falls short on the actual incident management piece. On top of this, only one training academy that is specific to ARFF provides a practical IM/CCT program that can aid students in developing their IM/CCT skillsets for ARFF related events, and

that is at the Dallas-Fort Worth Fire Research Training Center at Dallas-Fort Worth International Airport. While other academies do utilize IM/CCT elements in their respective courses, none have a stand-alone course as of this writing. This is mostly because no standard or regulation exists to require officers that respond to ARFF incidents and events the requirements to obtain this skill set. The United States Fire Administration (USFA) and the National Fire Academy (NFA) has a degree track in ARFF Officer for the Associates Degree Level under the Fire and Emergency Services Higher Education (FESHE) initiative (United States Fire Administration, 2018). The Utah Valley University in Orem, Utah briefly had an ARFF Officer Certificate and Associates Degree program that followed the NFA's FESHE program but disbanded the program due to interest but also was never truly marketed by the college.

Using action research, the ARP answered the following questions: 1. What do Airport Fire Departments in the United States do to educate and train ARFF Officers who may be placed into command and unit officer positions during an airport-related emergency or incident; 2. What training and education topics do current ARFF Chief's and Officers think would be beneficial in a regulatory document to train and educate their unit and command officers; and 3. What barriers would exist for ARFF departments to implement officer-related initial and recurrent related training within their departments and would a regulatory document aid in providing a framework for implementation.

Background and Significance

Year #3 of the Executive Fire Officer Program (EFOP) is titled "Executive Analysis of Fire Service Operations in Emergency Management" and addresses the importance of the utilization and integration of emergency management in fire department operations and better prepare them for all-hazards incidents that are outside of the run of the mill fire department

responses. Emergency Management functions are not only the aspects of what happens once an incident takes place but also the preparedness function before the incident takes place and the post incident recovery. Within this section of the EFOP, Fire Service Operations in Emergency Management is utilized and encouraged because most community fire departments do not have enough resources to conduct emergency management in addition to their current duties and be effective or even marginally good at it. Specific to airports, airport and aircraft-related events of any sort of magnitude will likely need to have some kind of emergency management function included in the response and recovery efforts and may have them pre-incident as well. While other stakeholders are typically in charge of the management and operation of airport management within each community (assuming they have an airport), each fire and rescue response agency has an obligation to be not only aware of the process and procedures for incidents and events that may occur but also be an active participant in the entire response cycle including pre- and post-incident.

The strategic framework of the USFA lays out a foundation of three goals that help to enhance and provide direction in how the USFA will support the United States Fire Service. These goals are found in the USFA document titled *"A prepared and Resilient Fire and Emergency Medical Services: Strategic Plan Fiscal Years 2019-2023"* and was released in June of 2019. Of the three goals relayed in this document, goals #1 and #2 are relevant to this research in developing advocacy for a regulatory document in IM/CCT initial and recurrent training topics for ARFF Unit and Command Officers that work at our nation's airports. Respective to this ARP, goal #1 states that the USFA will "Build a culture of preparedness in the Fire and Emergency Medical Services" (United States Fire Administration, 2019). This particular goal directly relates to the need for not only the USFA to work toward building a

culture of preparedness but also cascades down to the various levels of the fire service. One could also argue that this goal is directly attributable to other stakeholders who have a meaningful place within the United States Fire Service such as the FAA as it relates to ARFF. Goal #2 states that the USFA will work to "ready the nation's Fire and Emergency Medical Services for all hazards" and strives to ensure that the entities and resources at all levels are as prepared as possible for all events that can take place in their jurisdiction, regardless of the likelihood or probability. Within this, this goal works to ensure that responders are given the tools that are needed for response to events that will hopefully never happen but still require preparation nonetheless. This includes activities of significance that take place at our nation's airports (aircraft crashes, infectious disease, mass-transportation related accidents, active shooter, dangerous goods, etc.) as well as aircraft-related incidents that occur outside of the airport environment. These two goals are relevant to the research because they show a direct relationship between the goals as set forth by the United States Fire Administrator and the need to establish a culture of preparedness that will undoubtedly be enhanced by the implementation of an IM/CCT regulatory document. The gain in a change in culture would help to ensure that ARFF Officers receive the necessary tools and skillsets can better place them in a winning advantage on game day when an incident occurs by another federal agency, the FAA.

The other significant aspect of this research is the outcomes of findings from the NTSB. In June 2014, the NTSB tasked the internationally recognized Aircraft Rescue and Firefighting Working Group (ARFFWG) to work with the FAA to find solutions to four safety-related recommendations as a result of the San Francisco Asiana 214 crash in July of 2013. Of the four recommendations, recommendation A-14-61 was a task to develop and distribute training materials that assist command officers in having a minimum level of training in aircraft rescue

firefighting (ARFF) task knowledge. More specifically, the NTSB stated in recommendation A-14-61: "Develop and distribute, in conjunction with the Federal Aviation Administration, guidance and training materials to ensure that all airport and mutual aid firefighting officers placed in command at the scene of an aircraft accident have at least a minimum level of aircraft rescue and firefighting training." (National Transportation Safety Board, 2014). In response to this, the ARFFWG developed four separate subcommittees to address the four recommendations, and in September of 2018, the group submitted four separate ARP's in response to the safety recommendations to the NTSB. The subcommittees were made up of a cross-section of ARFF responders and officers from around the country from varying sizes airports and included collaboration from the FAA. As with A-14-61 safety recommendation, the researcher was the subcommittee chairman for this group and assisted in the development of nine answers to the safety recommendation as requested by the NTSB (Appendix A displays the nine proposed recommendations for this subcommittee). Seizing a rare opportunity to affect change within the industry as a result of this event, the group went above and beyond to recommend enhanced measures for the betterment of the ARFF industry with the intent on saving lives and making the airports much safer. Recommendation #7 (complete list of recommendations from this group is listed in Appendix A) advocated to the FAA to amend advisory circular 150/5210-17C to include command and control training within that document (and future documents), and this APR takes that recommendation one step further and promotes a separate, stand-alone document on IM/CCT for ARFF Unit and Command Officers:

> **Recommendation #7:** Inclusion of Command & Control Training in the FAA AC 150/5210-17C Programs for Training of Aircraft Rescue and Firefighting Personnel: In order for command and control training to be implemented and actually conducted for ARFF departments, it is recommended that FAA AC 150/5210-17 be amended to include language on the completion of NIMS related training but also task-specific command and

> control training related to aircraft and airport-related incidents. (Aircraft Rescue Firefighting Working Group, 2018).

In October of 2018, the NTSB accepted all of the answers to the safety recommendations as provided by the ARFFWG and closed the action as "Closed, Acceptable" with favorable feedback provided to the organization for its efforts. With the language above, the NTSB has tasked the ARFFWG and the FAA to work toward a solution in what has been considered a gap in not only the ARFF environment but also with other transportation-related modes. The acceptance of the recommendations of all four sub-committee workgroups was revolutionary for the ARFF industry, with future implementation likely on most of the final recommendations.

To further advocate for this regulatory document, other initiatives at the national level are worthy of discussion within this research. In July of 2016, various fire service stakeholders assembled in Racine, Wisconsin, at the Johnson Institute to participate in Wingspread VI. The Wingspread conference has been held every ten years starting in 1966 and has developed statements for the United States Fire Service of national significance—primarily policy statements and goals for the following decade. One additional aspect and advocacy for the development of a regulatory document requiring IM/CCT for our nation's ARFF officers is the national initiative of priorities as a result of the Wingspread VI conference and in particular, five goals which help to justify the need for training endeavors and operational preparedness initiatives such as this. The five goals which are relevant to this research and advocacy are:

> Goal #1: The United States fire and emergency services have an urgent need to be prepared for homeland security response and violent incidents in our communities. Critical factors for being prepared to include gathering and using evidence and data to establish a preparedness plan and developing and improving relationships with all stakeholders and other related agencies (The Johnson Foundation, 2016, pp. 2-3);
>
> Goal #2: As guardians of life safety, the United States fire and emergency services must expect, embrace, and adapt to change by continuing to define and adopt current

> administrative and operational best practices. To be competitive and sustainable in a changing environment, agencies must become change agents rather than reactionaries.
>
> Goal #5: The United States fire and emergency services must place importance on marketing and branding. Our ability to survive and thrive is dependent upon having the ability to communicate our value to the community.
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> Goal #6: The United States fire and emergency services must encourage the development and use of realistic training simulations (similar to commercial aviation flight simulations) delivered in ways that are intrinsically safe. Crew resource management and current hazard management certification programs should be modeled as examples of best practices in the development of training simulations and (The Johnson Foundation, 2016, pp. 10-11);
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> Goal #11: The United States fire and emergency services must prioritize an all-hazards mitigation and response model that connects our customers with the necessary community resources, agencies, and services to produce safe and effective incident outcomes (The Johnson Foundation, 2016, pp. 18-19).

The critical aspect of the findings and goals, as laid out by the participants of the Wingspread VI conference, is that it's a collaboration of fire service leaders who are attempting to set the national fire service agenda based on the current needs of today. With the five goals as listed above, the advocacy and lack of regulatory guidance from the FAA for IM/CCT functions lead directly to the intentions as outlined from this monumental conference. Much thought and reflection go into the development of these statements of national significance and direction that is expected to be taken by the United States Fire Service in the coming decade. With the cross-disciplines that are impacted by an aviation-related emergency, having fire service personnel who are trained in this discipline demonstrates to external stakeholders at the nation's airports that the ARFF fire service is committed (as it always has) to working towards this during an aircraft or airport related incident.

With programs that educate and simulate IM/CCT of ARFF-related emergencies being few and far between, the need for a regulatory document that provides substantial training

benchmarks at the initial and recurrent levels to ensure officers that are assigned to the nation's airports are as ready as possible for day and event that everyone hopes will never will happen. History has shown that emergency responders are responding to aviation-related events and incidents on a regular basis, and very little in the way has been done to ensure that personnel has been given the tools to ensure they can succeed from a regulatory perspective from the FAA. The development and implementation of a regulatory requirement in IM/CCT would demonstrate the seriousness of the FAA to support these national goals of significance that the USFA and NFA have provided and goes a long way toward achieving community risk reduction and operational readiness.

Literature Review

Aside from traditional municipal fire departments, ARFF departments are bound by additional regulations from the FAA and national consensus standards from the National Fire Protection Association (NFPA). The existing guidance and training materials utilized in ARFF training vary from FAA regulations and Advisory Circulars to NFPA standards to few textbooks that are specific to this specialty within the fire and emergency services industry. All of these were reviewed in order to establish the resources available to meet the regulatory requirements for the initial and recurrent training knowledge base for aviation-based firefighters and officers. It also demonstrates, respective to the specific ARFF based materials, items that may need to be accounted for in a document that addresses IM/CCT for ARFF Departments.

The document providing the structure for the operations and training of ARFF departments in the United States is *14 CFR Part 139, sections 315 through 321*. Specifically, Section 319 of 14 CFR Part 139 mandates the operational and training requirements for ARFF personnel, including the establishment of the required topics for training in twelve specific

categories as well as the completion of a live-fire drill once in a twelve consecutive month span (Federal Aviation Administration, 2004). It is this structure that gives all departments providing ARFF services at certificated airports a minimum baseline for the establishment of their initial and annual recurrent training programs (Federal Aviation Administration, 2004). Under the framework of 14 CFR Part 139 is a more comprehensive document outlining the minimum training standards, which is *FAA Advisory Circular (AC) 150/5210-17C: Programs for Training of Airport Rescue and Firefighting Personnel* (Federal Aviation Administration, 2015). FAA AC 150/5210-17C addresses more in-depth the specific benchmarks that are required to be covered by each category of mandated topics. This document also discusses the methods in which ARFF personnel are initially trained as well as encourages personnel and departments to complete national professional certification testing under Airport Firefighter Professional Qualification of National Fire Protection Association (NFPA) 1003 through the Pro Board of Fire Service Professional Qualifications (Pro Board) and/or the International Fire Service Accreditation Council (IFSAC) (Federal Aviation Administration, 2015). These two regulations, however, do not address or offer any requirements in the methods or materials in which fire officers are trained or educated with task-specific items for the ARFF environment. Because of this, airport management elements will oftentimes point to this as something that is not required and, therefore, an unnecessary expense or time usage within an ARFF training program.

The NFPA has several documents that address initial and recurrent training as well as operational requirements for ARFF personnel. NFPA documents are often referred to as national consensus documents, and the following are sometimes used by departments to help augment the training programs for many ARFF departments worldwide. NFPA 1003 (2015 edition) is the standard for Airport Firefighter Professional Qualifications and establishes the Job Performance

Requirements (JPR's) for ARFF personnel (National Fire Protection Association, 2015). Many ARFF departments use this standard as the baseline and initial training program for their staff. Upon completion of the core curriculum, personnel are tested based on the established JPR's in NFPA 1003 (National Fire Protection Association, 2015). A majority of states in the US offer national testing under Pro Board and/or IFSAC certifying entities through their local or state fire training organizations. The NFPA 405 (2015 edition) standard addresses Recurring Proficiency of Airport Firefighters (National Fire Protection Association, 2015). NFPA 405 closely resembles the FAA AC 150/5210-17C recurrent training tasks such as duties under the airport emergency plan, annual live-fire training, and airport/aircraft familiarization training.

Another regulatory document that is utilized by the United States ARFF Departments as an ancillary document to FAA AC 150/5210-17C is *FAA AC 150/5210-23 titled "ARFF Vehicle and High Reach Extendable Turret (HRET) Operation, Training and Qualifications"* (Federal Aviation Administration, 2010). This document was created and issued to the United States ARFF industry in September of 2010 to provide guidance to ARFF departments in building and maintaining their respective driver/operator training programs for ARFF vehicles. While this document is not directly related to any IM/CCT aspects as laid out in this ARP, it shows a willingness by the FAA to establish a separate document with emphasis on requiring compliance and proficiency in a specific subject area. FAA AC 150-5210-23 was developed as a result of the Philadelphia UPS DC-8 cargo aircraft fire as a recommendation from the NTSB. FAA AC 150-5210-23 is a comprehensive document that ARFF departments can utilize to build and maintain their ARFF vehicle training and qualification programs and is a document that Airport Certification Safety Inspectors (ACSI's) use to check for compliance during their annual safety inspection that is conducted at each airport.

On February 28th, 2003, President George W. Bush established *Homeland Security Presidential Directive-5,* which mandated a single, comprehensive national incident management system or NIMS (United States Department of Homeland Security, 2003). It was this directive that NIMS was created and is now a staple across the nation for the management of events and incidents that involve entities such as fire, EMS, law enforcement, and public works (United States Department of Homeland Security, 2011). NIMS is a requirement for airport personnel and is one of the best practices that is utilized for the management of large and small events and incidents. The one fallacy of NIMS is that it does not provide strategic or tactical skillsets for an officer to utilize on the scene of an airport or aircraft-related incident (or any incident for that matter)—these skill sets still have to be provided and used under the structure of NIMS. There is an established minimum training requirement for the various positions in order for assigned personnel to have a solid understanding of their responsibilities entering the incident. When combined with the knowledge, skills, and abilities of ARFF professionals, NIMS/ICS will provide the critical operational and command infrastructure to successfully and safely manage aircraft incidents to successful completion.

One regulatory standard that helps to advocate the need to add IM/CCT to the FAA regulations is based on one from our neighbors to the north in Canada. The regulatory standards between Canada and the United States are nearly identical in their makeup and content. In Canada, the regulatory agency is Transport Canada and *Canadian Aviation Regulation 323* addresses ARFF in both operational and training requirements at Canadian airports (Transport Canada, 2007). Specific to this research, section 323.14 (3) (b) addresses command and control training in its own category with a minimum of seven performance requirements and leads to demonstrating the need for ARFF officers to possess this training. Each year, Canadian ARFF

personnel (not just ARFF officers) participate in annual command and control training that undoubtedly aids their skill sets.

Internationally, the International Civil Aviation Organization (ICAO) works as an arm of the United Nations to establish aviation related requirements for airports across the globe. These standards include elements for aviation-based fire and rescue departments to help set the baseline for the initial and recurrent training of their personnel (International Civil Aviation Organization, 2008) in countries that do not possess their own regulations/standards. *ICAO document 9137—AN/898, titled Airport Services: Part I – Rescue and Firefighting, 4th edition* addresses ARFF services at airports across the globe and includes training requirements and benchmarks (International Civil Aviation Organization, 2015). Specifically, in chapter 14, and in section 14.8, leadership performance is addressed with an emphasis on building their command and control programs to prepare them in advance of a crisis (International Civil Aviation Organization, 2015).

Along with the requirements of ICAO, the Civil Aviation Authority (CAA) of the United Kingdom (UK) and the European Aviation Safety Administration (EASA) have established enhanced standards for the training and education of ARFF firefighters and officers. In the United Kingdom (UK), the CAA has established the *Framework for the Competence of Rescue and Firefighting Service (RFFS) personnel* (Civil Aviation Authority, 2008). This document is an essential piece for this research project because it demonstrates a level of enhanced job performance for ARFF personnel, including officers. Along with this document, the EASA *Acceptable Means of Compliance (AMC) and Guidance Material (GM) to Authority, Organisation, and Operations Requirements for Aerodromes* addresses requirements for the training and makes specific references to training personnel in operations of human performance,

team coordination and mandates regular proficiency checks of the personnel (European Aviation Safety Agency, 2014).

NFPA 1021: Standard for Fire Officer Professional Qualifications (2014 edition) and *NFPA 1026: Standard for Incident Management Personnel Professional Qualifications* (2014 edition) address JPR's for unit and command officer-related personnel. In NFPA 1021, it defines four levels of progressive responsibility for fire officers and includes Supervising Fire Officer (Fire Officer I), Managing Fire Officer (Fire Officer II), Administrative Fire Officer (Fire Officer III) and Executive Fire Officer (Fire Officer IV) (National Fire Protection Association, 2014). Within each of these levels brings added layers of command and control/incident management responsibility and enhanced skills in emergency planning (National Fire Protection Association, 2014). NFPA 1026 addresses job performance requirements for personnel that participates in the various incident management functions under the National Incident Management System (NIMS) (National Fire Protection Association, 2014). The JPR's of NFPA 1026 fall directly in line with the NIMS framework and task allocation. These two relevant NFPA standards are typically used for the training of fire officers all across the country, including the aviation-based fire services (National Fire Protection Association, 2014). However, it does not provide aviation-specific skill sets but is used as a training base. NFPA standards provide for reasonable best practice benchmarks for personnel and organizations to achieve and attain. As national consensus standards, they help to ensure that personnel receives, assuming that the Authority Having Jurisdiction (AHJ's) are utilizing them, a minimum level of training and education for the particular professional positions they hold. These standards, often-times, form the baseline of training programs and operational response models for ARFF at US and international airports.

Along with NFPA and FAA standards/regulations that were reviewed as part of this project, the Occupational Safety and Hazard Administration's (OSHA) regulation on hazardous materials are relevant for this project. OSHA regulation 1910.120 addresses hazardous waste operations and emergency response for facilities and events involving any type of substance considered to be a hazardous material (Occupational Safety and Health Administration, 2013). As it relates to this research, many incidents involving the management of aircraft or airport-related event will likely include a hazardous material. The OSHA 1910.120 regulation requires all responders to hazardous material incidents to complete and possess specific knowledge, skills, and abilities for their task level and includes awareness, operations, technician, specialist, and incident commander levels (Occupational Safety and Health Administration, 2013). This is important not only because of the potential and likelihood of a hazardous material substance of some kind on the scene of an ARFF incident but also shows a parallel with a similar industry on the breakdown of required knowledge, skills, and abilities that are needed to conclude an incident successfully and safely. Specific to hazardous materials events, NFPA 472 is the Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents and lays out the particular JPR's that a responder needs to accomplish at the various levels (National Fire Protection Association, 2013). The levels of JPR's are relevant to this project because they can provide a source of materials for a professional development model in the ARFF industry that is not only tested through best practice but also required under the OSHA regulation (Occupational Safety and Health Administration, 2013).

The NFA is arguably considered the premier fire instruction institution in the United States. Each year, thousands of fire service personnel from around the country (and the sometimes the world) travel to the NFA to attend classes among the various disciplines that are

offered or attend courses via the outreach opportunities at the state or local levels or online. One of the course disciplines that are offered by the NFA is the Command and Control series under the Incident Management discipline and provides participants the ability to learn task level skills that can be applied to incident management strategies. Under the Incident Management discipline and within the command and control series are four (five if you count the Wildland/Urban Interface Course) separate classes that build on each level but are not successive and can be taken in any order. The four classes are tremendous in their opportunities and provide an avenue for students to manage and simulate various roles within a plethora of incidents but do not address aviation-related incidents. The NFA course offerings (as they stand today or future offerings that are related to ARFF incidents and events) are relevant to this APR because they may able to provide end-users of the proposed IM/CCT recommended regulatory guidance in this APR the training that is needed to comply with the FAA AC. Utilization of the NFA and other like resources is a cost-effective way and fiscally responsible way to get officers the training and education they need to do their jobs as unit and command officers better.

The International Association of Fire Chiefs (IAFC) Officer Development Handbook, 2nd Edition (International Association of Fire Chiefs, 2010), is a crucial document to the American Fire Service because it finally gave much-needed structure to how officer training and development should take place. This document is a collaboration of several United States Fire Service stakeholders and breaks down the critical skills, training, and tasks that an officer candidate needs in order to be successful at various stages of their fire service careers. This document also illustrates the progression of how an officer candidate should proceed through officer training under the National Professional Development Model. All fire officer candidates

and departments should be familiar with this document and use it to create and continually train fire officers that are in their respective departments.

Along with the IAFC Officer Development Handbook, the ARFFWG produced a guide titled the *ARFFWG Professional Development Framework Manual* (Aircraft Rescue Firefighting Working Group, 2018) for departments to utilize in the development of their professional development programs. The ARFFWG Professional Development Framework Manual was completed in 2018 is available to all ARFF Departments in their quest to develop their own professional development program that is task-specific to ARFF related training and education and their departmental needs and rank structures. The United States ARFF industry has mostly struggled to establish its own professional development framework, and this manual can aid in this area for departments who don't know how to get started or want to enhance/supplement their own programs. This manual was developed by this ARP researcher in 2017 as part of a master's degree capstone program with final adoption in 2018 by the ARFFWG.

The IFSTA 6th edition "Aircraft Rescue Firefighting" manual is one of two training textbooks currently available in the Aircraft Rescue Firefighting (ARFF) industry (International Fire Service Training Association, 2015). This particular book is used worldwide for the training of ARFF personnel and provides baseline information for initial and recurrent training; through the six editions, it has been a mainstay in ARFF training. The manual, however, does not offer very much in the way with respect to IM/CCT beyond basic strategies and tactics that are used at the task level.

Christen and Maniscalco's textbook titled *Mass Casualty and High Impact Incidents: An Operations Guide* (Christen & Maniscalco, 2002) provides a base of knowledge for first responders who may be called upon to integrate and manage an incident involving a high number

of victims. Using the model of the NIMS/ICS, the book goes into great detail the specific positions that will be required to manage the emergency medical services side of an event. The goal of learning the particular functions and associated duties allows responders to integrate seamlessly at any point in the incident with the emphasis on successfully concluding the incident.

IFSTA's *Fire Department Company Officer, 5th Edition* (International Fire Service Training Association, 2014) *and Chief Officer, 5th Edition* (International Fire Service Fire Training Association, 2014) both provide examples to coincide with JPR's from NFPA 1021 on the importance in knowing and demonstrating community-related services, strategies and tactics, and incident command system for incident management related functions. These skills, along with the knowledge of ARFF associated skills and expertise, can assist in responding to personnel's integration into the command structure. IFSTA Chief Officer also provides a robust section on comprehensive disaster planning and conducting a post-incident analysis. These two manuals, similar to the IFSTA Aircraft Rescue and Firefighting Manual, are used throughout the world for the training of aspiring and incumbent fire officers in the JPR's of NFPA 1021 and its four levels of progression.

One final textbook reviewed for similarities in incident management is the 4th edition of "*Hazardous Materials- Managing the Incident*" by Gregory Noll and Michael Hillebrand (Hillerbrand & Noll, 2014). An added element to aircraft or airport-related emergency response is the likelihood that hazardous materials are often a component of that particular incident. This reference provides comprehensive techniques, tactics, and strategies for the mitigation, incident management, and termination of the incident using an eight-step process under the OSHA 1910.120 HAZWOPER Standard for Hazardous Materials Incident Command.

Airport Cooperative Research Program (ACRP) project 103 titled *"A Guidebook for Integrating NIMS for Personnel and Resources at Airports"* (Airport Cooperative Research Program, 2014) provides structure and guidance for integrating and using NIMS for scalable airport-related incidents and provides valuable information that incident commanders and fire and rescue departments could utilize for aviation-related incidents. This report is also significant because many airports have multiple transportation options at their airports, and a seamless utilization of NIMS is essential to the successful conclusion of the incident. The report advocates the need for regular practice and drilling in the use of NIMS well in advance of the incident of any size at the airports or like facility.

The Transit Cooperative Research Program (TCRP) project 86 titled *"Public Transportation Emergency Mobilization and Emergency Operations Guide"* is a document that was assembled to assist transit agencies and communities on the best practices on the management and pre and post-incident activities with transportation-related incidents and events (Transit Cooperative Research Program , 2005). The TCRP projects are a collaborative effort of subject matter experts with the industry that aim to provide guidance materials and best practices. While this document is predominately geared toward a law enforcement perspective, there is an emergency management component to this manual and helps a framework of what jurisdictions should be doing in preparation for an incident but also during and after an event. This document works to provide the stakeholders with an all-encompassing reference to ensure that every portion of the transit systems and communities are utilized to handle the passengers/victims but also getting society restoration with the transit system and the community.

As the literature demonstrates, while there are minimal training standards and regulations along with training opportunities respective to ARFF related IM/CC, the documentation does exist for the need for first responder personnel to train and be knowledgeable in this area. It also shows the need to have regulations in place to potentially force ARFF Departments to complete this training as some won't without the regulations in place. Several of these documents (the ACRP and TCRP) show tremendous amounts of research and provide best practices to the fire service and emergency management community on how to be prepared for an event such as a aircraft or airport related incident. By using the references that are listed above, a complete and comprehensive regulatory guidance document can be developed and implemented to establish IM/CCT training and education benchmarks that would benefit the United States ARFF unit and command officers and the flying public as a whole.

Procedures

The objective and goal of this research study and the subsequent final recommendation are to demonstrate a need for and provide a regulatory guidance document that directs ARFF departments in the training and education of their unit and command officers that serve in both formal and informal positions. In addition to providing the framework for IM/CCT for ARFF Departments, this document will help to create the need and requirement for ARFF departments to complete this training initially and on a recurrent basis as no current standard exists. The overall end result of this ARP is to be able to provide a finished draft recommendation document that is supported by data and buy-in to the senior administrators of the FAA on this subject. It is hopeful that the data derived in this ARP, along with the draft document, will provide substantial justification for the recommendations to be implemented following the submission of this ARP.

The researcher used action research to answer three questions for this ARP: 1. What do Airport Fire Departments in the United States do to educate and train ARFF Officers who may be placed into command and unit officer positions during an airport-related emergency or incident; 2. What training and education topics do current ARFF Chief's and Officers think would be beneficial in a regulatory document to train and educate their unit and command officers; 3. What barriers would exist for ARFF departments to implement officer-related initial and recurrent related training within their departments and would a regulatory document aid in providing a framework in the implementation. Airport contacts were used instead of a broad "shot-gun approach" because of the replication and, most importantly the confidence of receiving a better return on the results by using this route. Airport contacts were also solely in this effort as they are the ones who will have a stake in the game with the finished product (assuming it can be adopted by the FAA).

To conduct the survey, the researcher utilized Google® Forms (Appendix B is a copy of the survey questions) to capture the data from fourteen multiple-choice or short answer questions that could be answered in a few short minutes. The survey was sent to seventy-nine airport contacts from around the country that were made up of the C, D, and E index airports and received nearly a 42% (41.9%) return rate. These three indexes were used because they already have an established network that is utilized to share and disseminate information amongst themselves with the C's and D's beginning to establish a networking loop and the E's already having a longer-term relationship amongst themselves. The questions in the survey were:

1. Do you require your officers—command and/or unit— to comply with the requirements FAA AC 150-52017C document?
    a. If the answer was yes to Question 1, why do you require it?

   b. If the answer was no to Question 1, why don't you require it?
   c. If you answered partial—depends on the rank to Question 1, what breakdown do you make these requirements?
2. To what level do your ARFF Officers complete officer training (i.e., Fire Officer I-IV, NFA related classes, EFO, AMF/AFO, etc.)?
3. Do you have any specific ARFF Officer training programs in your department to train officers (either formal or informal officers)?
4. What levels did you require NIMS for your personnel?
5. Do you require your officers to complete any refresher training with respect to incident management/ command and control training?
6. Do you have any simulation or computer-based programs that are utilized for simulation incident management/command and control training or have the ability to participate in a command lab type of experience?
7. Assuming that your department allows for it when an officer moves up either through promotion or short-term/long-term acting, do you require any additional qualifications for that person to be in that position-specific to incident management or command and control functions?
   a. If the answer is yes to Question 7, can you elaborate on these qualifications?
8. Do you require your incident commanders and unit officers to be OSHA Hazmat IC qualified?
9. If a regulatory document were to be implemented by the FAA to aid in the training of airport-related officers in Incident Management/Command and Control functions for

ARFF Officers and personnel, what topics would be included in that list such as Mass Casualty Incident Management or Strategies and Tactics?

10. Would a document such as this be welcome in your department and aid in your department's training plan?
11. What barriers would exist in the implementation of such a document for your department's training plan?
12. Airport/Index
13. Number of Officers & Ranks
14. Number of Personnel

The first research question wanted to take a look at what current ARFF departments in the United States do to educate and train ARFF Officers who serve in a unit or command officer role during an ARFF incident. The information was obtained by the researcher asking several questions in a survey to determine what the specific ARFF departments are doing to train their personnel for events and incidents that could take place at their airports. Specifically, questions #2 (what level do your officer's complete officer training) and #3 (do you have any specific ARFF officer training programs in your department) sought to address this question. To further enhance this research question, the researcher conducted an internet search to see if any programs related to ARFF Officer training were available in any capacity or setting. Prior to the search, the researcher was aware of only one course related to this topic that is continuously held at the Dallas-Fort Worth International Airport Fire Research and Training Center. The significance of this research question is to determine if training is currently being conducted with respect to IM/CCT that is specific to ARFF that could be utilized to establish the JPR's that will

be listed within the draft regulatory document and not reinvent the wheel so to speak if the material or items are already in place for end recommendation for this APR.

The second research question looked at the elements and requirements that the industry (via the seventy-nine survey participants) felt would be necessary for a regulatory document that would be used to initially and on a recurrent basis train unit and command officers within an ARFF Department. Question #9 in the survey asked participants what they believed would be necessary to be included in this document with the hope that substance would be provided to help guide the document with core material that the industry felt would be necessary and worthwhile, should it be implemented. Fundamentally speaking, this question is relevant to the research because it attempts to learn what each department thinks is important and/or necessary skillsets for its officers. This question is also significant because it provided the industry (via the survey participants) the ability to weigh in on the thoughts and feelings toward this subject on the front side and in a downrange aspect, provides documentation that a cross-section of the industry was polled once the document is adopted and implemented.

The third research question was asked to determine what barriers would exist in the implementation of initial and recurrent ARFF Officer related training within their departments and if such a regulatory document would be welcome. Survey questions #10 (would a document be welcome) and #11 (what barriers would exist with implementation) that were sent to the seventy-nine participants provided feedback in this area. A program failure would be to develop a regulatory instrument and not understand the barriers or obstacles that each department would have in its adoption once approved and released by the FAA. The second part of this question regarding if it would be welcomed was not utilized to gain support or buy-in from the survey participants but merely to test the water to see how pro or con the industry would be for this

regulatory document as most new regulatory documents are not typically embraced when handed down to the masses.

Results

The first research question of this ARP looked at what Airport Fire Departments (ARFF Departments) in the United States do to educate and train ARFF Officers who may be placed into command and unit officer positions during an airport-related emergency or incident. The question itself was broad in nature and done so on purpose to see what kinds of responses might be received from the survey participants. As it has been previously stated, with the exception of the various NIMS training classes for the different levels of the fire service, there are no requirements for ARFF Firefighter or Officers to complete on an initial or recurrent basis within any FAA regulatory documents with IM/CCT. In addition to this, there are very few opportunities that exist from the ARFF training academies in the way of an ARFF IM/CCT courses that participants can go to attend for departments that are proactive. The lack of courses can be attributed to the fact many departments do not send personnel to training because it's not required. Currently, the Dallas-Fort Worth Fire Research and Training Center is the only training academy that offers a comprehensive IM/CCT course in the United States for ARFF personnel. The researcher has attended several courses at this facility, including an IM/CCT course in 2008. Following this, the researcher conducted an internet search to determine if any other ARFF-specific IM/CCT courses were available with no results being found in either an available curriculum that could be downloaded, purchased or available for departments to send people to. The ARFFWG has produced an ARFF Officer course that includes elements of IM/CCT and nearly all of the subject areas of the draft regulatory document that is proposed in

this document. As of this writing, the program is available as of January 9th, 2020 to organizational members to download and customize for their own departmental training needs.

To further breakdown this first research question, the researcher posed several questions in the survey instrument to ascertain how ARFF departments arrived at the training (or non-training) they do for unit and command officers respective to IM/CCT. The first question in this survey regarding if ARFF departments require officers to comply with the elements of FAA AC 150/5210-17C respective of the training requirements. With FAA AC 150/5210-17C is a clause in the document in section 1.4.1.7 on page 1-10 that addresses "Personnel Who Do Not Normally Fight Fire" and creates a grey area on who needs to possess this training outside of those who are actually doing the grunt work on an incident and could construe that a command officer would not need to complete annual training as set forth in 150/5210-17C (Federal Aviation Administration, 2015, pp. 1-10). The question posed to the survey participants was, "Do you require your officers (any and all ranks) to comply with the Federal Aviation Administration Advisory Circular 150/53201-17C?". The survey provided three answers that included yes, no, and partial—depends on the rank. Of the responses, twenty out of the twenty-nine (68.9%) survey participants stated they do require their officers to remain in compliance of the 150/5210-17C while eight of the twenty-nine (27.5%) said they do so on a partial basis based on rank and only one participant out of the twenty-nine (3.4%) reported they do not make their officers comply.

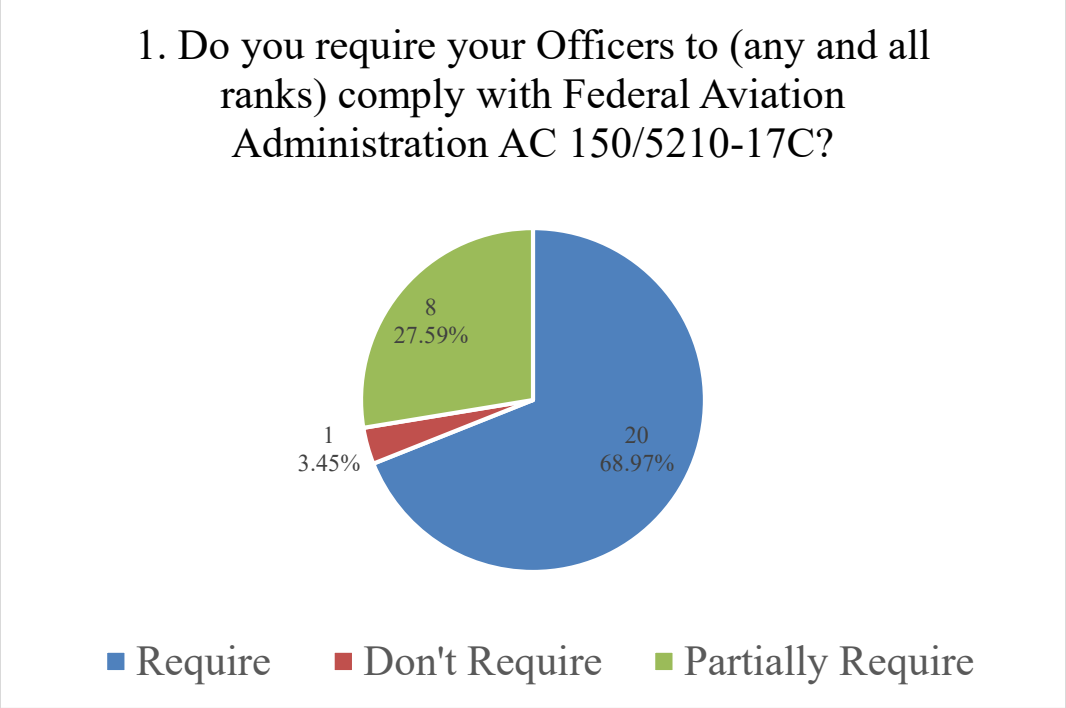

Figure 1: Pie chart of results of survey question #1 that asked if ARFF Departments require their officers to comply with FAA AC 150/5210-17C.

This survey question was relevant to the researcher because the long-standing belief is that departments are conducting the training as per the current regulatory document and 14 CFR Part 139 but may or may not be going beyond what is listed in the document respective to specific training for them to better do their jobs in the IM/CCT setting. Both the 14 CFR 139 regulation and the 150/5210-17C documents are incredibly comprehensive, with very little focus on task level items that demonstrate the proficiency of officers in doing their jobs.

Within the first survey question, the researcher asked a follow-up question as to why the departments do what they do respective to their particular answers. Of the twenty respondents that answered the question that they do require their officers to comply with the 150/5210-17C document, the answers were quite varied in their responses. Nearly all of the answers centered around the fact that they as department deemed that is was a requirement in some form or fashion to comply with the document and did not delineate with the interpretation that those that

did not directly fight fire didn't have to complete this initial and recurrent training. Of the one participant that answer no to this question, they did not give an answer as to why they don't require their officers to be compliant with the 150/5210-17C document but did state in the "Yes" column that it was a requirement. Within the "Partial—Depends on Rank" answer, the answers were again all over the place but generally speaking centered around the fact that command officers were still required to complete the training, but other higher-level chiefs were not required to do so. One respondent stated that they pick and choose what requirements they make their officers complete and another noted that after the NIMS training was completed, all other requirements were a recommendation and not required. Two respondents stated they provided their command officers a course in airport or ARFF operations of some kind but did not make them complete recurrent training.

Continuing in research question #1, a second survey question was asked to respondents on what other officer trainings their ARFF officers completed. Of the answers given, twenty-five of the twenty-nine survey participants stated they did something or had a requirement for them to complete for the positions they hold. Examples given were the Fire Officer I through IV series, the ARFF Professional Designation program with levels of Airport Master Firefighter (AMF) and Airport Fire Officer (AFO) listed, task books or an in-house officer development program.

One bright spot in this area was with survey question #3 that pertained to this research question. The survey asked a question if any department had any specific ARFF Officer level training programs in their departments to train ARFF Officers in either a formal or informal basis. Of the replies, fifteen out of twenty-nine (51.7%) stated that they did have something, but no real substance as to the content was provided in the follow-up question other than in-house

training with a few stating they send people to outside training as it relates to ARFF Command and Control or a task book with performance requirements.

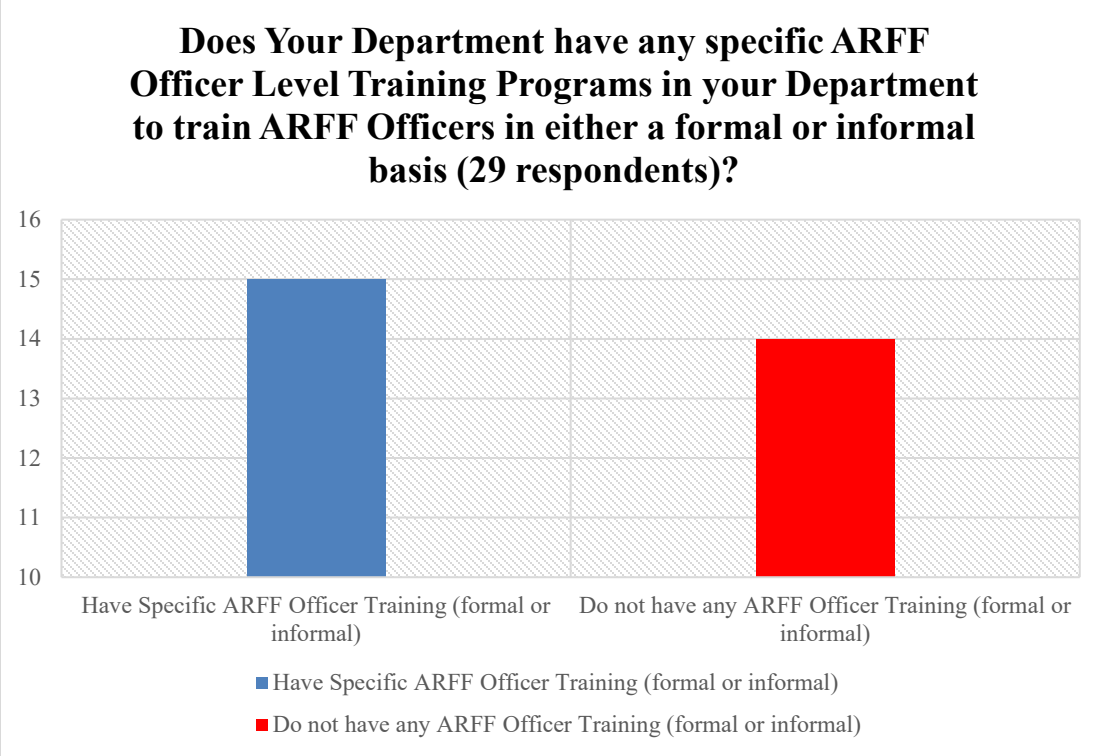

Figure 2: Bar graph depicting if ARFF Departments have any specific ARFF Officer Level Training that trains ARFF Officers in a formal or informal basis.

Finally, the last survey question (question #4) that relates to this research question is the completion of the requirements of NIMS. All survey participants stated they are complying with the federal government requirements of NIMS and unit, and command officers are getting the upper-level NIMS classes in NIMS 300 and 400.

The second research question of this ARP looked at what training and education topics that current ARFF Chief's and Officer's think would be beneficial in a regulatory document to train and educate their unit and command officers. This specific research question was utilized to gain an understanding of what they felt was important and necessary in a regulatory document on IM/CCT, but also to determine if anything was missed from the initial draft that was

formulated. Having this information is not only helpful for this document and subsequent revisions but also potentially provides the necessary buy-in to the materials once it's published in that a cross-section of the industry, as evaluated by the researcher, attempted to capture as much as could be obtained for the final submitted draft. The chart below lists the various topics that were mentioned and how many times the survey respondents mentioned it:

Training Topic	# Times it was Mentioned
Mass Casualty Incident Management	14
Strategies & Tactics	9
Active Shooter/Terrorism	5
Communications (Small and Large Scale)	3
Aircraft Familiarization	2
Command and Control	2
Command and Control of Large incidents	2
Fuel Fire Suppression Considerations	2
Hazmat IC	2
Hazmat/WMD/CBRNE	2
ICS/NIMS	2
Movement Training/SIDA/Airport Operations	2
Part 139 Topics	2
Safety Officer/Health & Safety Topics	2
Airport Operations Human Resource Training	1
Basic ICS with Fire Officer training with ARFF Specialty Added	1
Chief Officer Topics	1
Company Officer Topics	1
Fuel Handling	1
Hazmat Ops	1
ICS EOC Interface	1
Incident Command Checklists	1
Management of Resources (physical & financial)	1
Multiple Alarm Structure Fires	1
Mutual Aid Teamwork/Operations	1
Post-Incident Management	1
Pre-incident Planning	1
Recovery	1
Severe Weather Response	1
Size up recognition for aviation incidents	1

Span of Control	1
Strategic Decision-Making Process- Risk Management	1
Unified Command	1
Wide Area Search	1

Figure 3: Table of topics that ARFF Officers believed were important to include in a IM/CCT regulatory document.

While the above topics were extensive and far-reaching, the common theme, for the most part, was incident management or command and control related topics. Having this data set is vital to the research because it shows the ability of ARFF Officers who participated in this data gathering instrument the ability to articulate their important aspects of what this regulatory document should look like. Many of these items have made their way into the draft recommendation document.

The third and final research question of this ARP looked at what barriers would exist within their respective departments to implement officer-related initial and recurrent IM/CCT training in their departments and would a regulatory document aid in providing the framework in the implementation. The first part of this question (going in reverse order) wanted to look at how receptive ARFF departments would be if a regulatory document were to be enacted by the FAA. Survey question #10 asked respondents, "Would a document such as this be welcome in your department and aid in your department's training plan?" The responses were overwhelming in favor of a document such as this being handed down from the FAA. In fact, twenty-six of the twenty-nine respondents (89.6%) stated they would be in favor of it, with only three of the twenty- nine (11.4%) saying they would not be in favor.

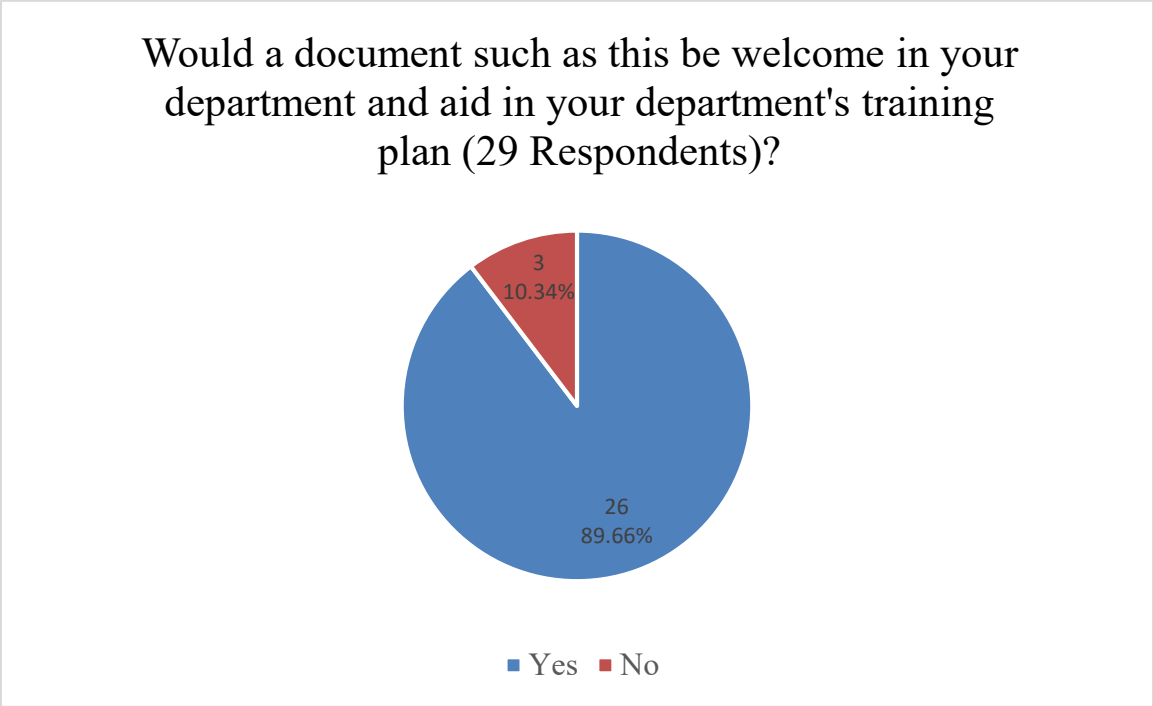

Figure 4: Pie chart depicting the results of the question if departments would be welcome in having a regulatory document to aid in a department's training plan.

The second part of research question #3 wanted to look at what barriers ARFF departments would have in implementing any regulatory document that is as game-changing as this document has the ability to have. This question was asked with the understanding and the desire to know how potentially the departments would be impacted once this was to be approved and implemented. The list of barriers that the respondents listed in the survey are listed in the chart below and the frequency that they were recorded (with closely listed barriers combined):

Barrier Topic	# of Times Mentioned
Funding	10
Resources/Time it takes to implement and/or develop	7
No Barriers	4
Culture Change	3
Senior Officers/Department Trying to Keep Old ways	3
Union/Labor Agreements/Unit Work	3
Training Schedule/Merging with Current Program	2
Ability to Provide the Training to Current Personnel in a Consistent Manner	1
Already Have a Training Plan	1
Delivering the Training to Mutual Aid Partners	1
Employee Engagement	1
If it's from the FAA, there will be no barriers; If it's from the NFPA the department will not implement or be the barrier	1
Increased Oversight	1
Less Control of Own Training Curriculum	1
Mutual Aid Officers May Not Want to Participate in Extra Training	1
What we have works for today	1

Figure 5: Chart depicting the potential barriers that ARFF Officers thought might impact the implementation of a regulatory document respective of IM/CCT training.

Along with the first list of training topics, this list also possesses some realistic (and some not so realistic) barriers to implementation within an ARFF Department. As with the other data, having these potential barriers, as seen with the survey participants, helps to potentially solve the issues in advance so that the acceptance (albeit via a requirement from the FAA) is more streamlined.

The third and final part of research question #3 looked at if departments are already doing refresher training in IM/CCT topics. Specifically, survey question #5 of the survey instrument asked respondents if they complete any refresher training with respect to IM/CCT within their departments. The respondents were given the choice of answers, "Yes, No or We Currently Don't, but are exploring the option." Of the answers that were given, it was nearly split in the answers that were given in that eleven of the twenty-nine (37.9%) answered "Yes," eight of the

twenty-nine (27.5%) answering “No” and ten of the twenty-nine (34.4%) answering “We Currently Don’t, but are exploring the option” as their answer.

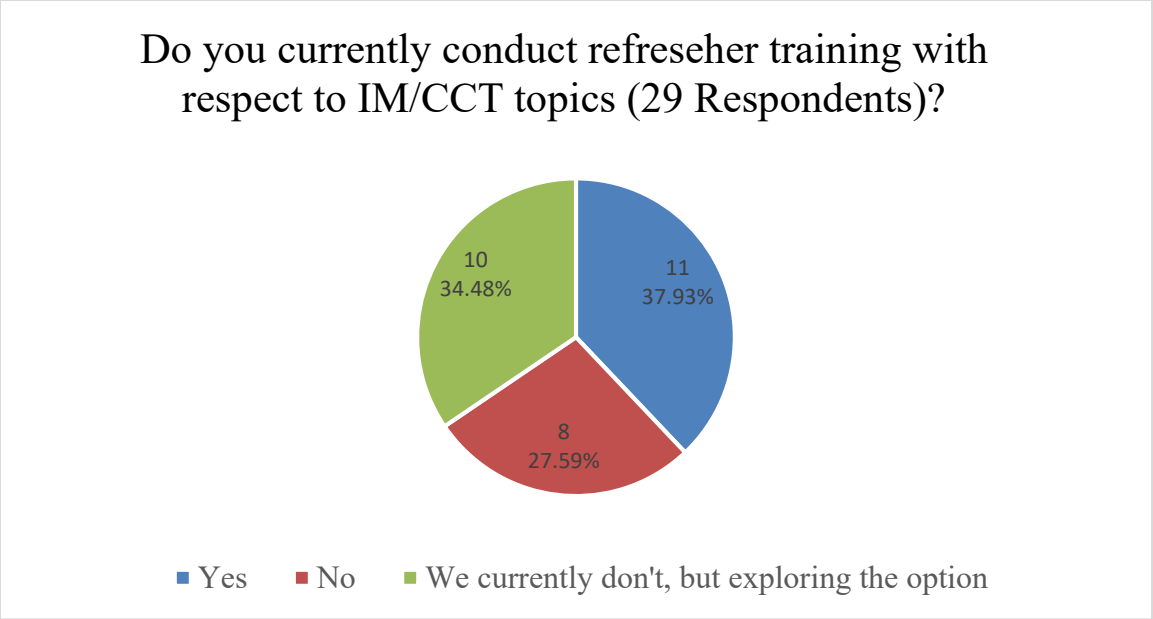

Figure 6: Pie chart of responses to survey question #5- Do you currently conduct refresher training with respect to IM/CCT topics?

With respect to the third research question, the researcher felt ample data was provided by the respondents respective of the potential barriers that ARFF departments would have in implementing a regulatory document such as this. It is important to know that this survey was asked to departments without any of the respondents actually seeing a draft of this regulatory standard recommendation and could either increase the barriers to implementation or decrease them depending on their stance of the document. The researcher felt that this was a better way of establishing a more unbiased data set without the draft document potentially playing more heavily into the barriers for or against its implementation into their respective organizations.

Discussion

Research question #1 of this ARP wanted to take a look at what Airport Fire Departments (ARFF Departments) in the United States did to educate and train ARFF Officers who may be

placed into command and unit officer positions during an airport-related emergency or incident. As it was noted in the results section, this question was proposed to be broad in nature so that a wide range of responses could be elicited from the selected survey participants (twenty-nine responses were gathered from seventy-nine participants who were invited to participate). The answers to the questions for survey question #1 were also expected to be wide-ranging due to the fact that no requirement exists for the IM/CCT by any current regulatory document of the FAA or with NFPA documents. Also compounding the problem is that most ARFF Departments do not go above and beyond the minimum standard in 14 CFR Part 139.319 or in FAA AC 150/5210-17C and implement their own IM/CCT (in whatever capacity they deem relevant or essential to their operation) and very few opportunities exist to send personnel to outside opportunities for specific ARFF IM/CCT courses. ARFF Executive Officers often face the frustrating barrier of having to provide services in an all-hazards environment with ARFF being only a sliver of their operation or being told by their administrators that if it's not required, they won't be doing it[4]. As it stands today, the only IM/CCT course that is being offered in the industry that is specific to ARFF is hosted at the Dallas-Fort Worth Fire and Research Training Center located at Dallas-Fort Worth International Airport.

To get to the answer for research question #1, the researcher posed several questions within the survey instrument to survey participants to gain an understanding of how they train their respective unit and command officers in IM/CCT for an ARFF related response. The makeup of each ARFF department is unique in that there are no requirements for staffing as set for by the FAA, and the respective departments are either part of a municipal department or part

[4] What is meant by this is that some ARFF departments provide multiple fire and rescue services to the airport environment while others may provide ARFF and other airport related services such as airfield operations and maintenance, law enforcement, grass cutting/snowplowing and/or fueling operations of aircraft as part of their jobs.

of an authority-like organization that has its own people. With that, the unit and command officers may already be based at the airport (at least one must be "in charge" of the unit at the airport), could be coming as part of a larger mutual or automatic aid assignment to the airport with a battalion-like response or be the Fire Chief of the ARFF Unit who works a daywork assignment and is off-duty when the emergency occurs. How these organizations are configured are relevant to how each train and prepare their unit and command officers for these types of responses. Unfortunately, this piece was not discovered until late and was not captured but would have been interesting to do a cross-section to see if there are genuinely differences as the researcher believes there are.

The first question that was looked at within this area was too look at what lengths ARFF Departments went to ensure their command and unit officers completed the elements within 14 CFR 139.319 and FAA AC 150/5210-17C with particular emphasis on why they made them complete the requirements. Within FAA AC 150/5210-17C is the clause that does not require personnel outside of those that do not regularly participate in firefighting activities exempt from these requirements. Based on what was indicated in the survey, many of the departments (twenty out of the twenty-nine or 68.9%) of the respondents stated they do make their unit and command officers complete this training. This is significant because it shows that the departments are going above and beyond the requirement despite the fact that they are not necessary to complete them (or are not familiar with the clause in the current regulatory documents). This is also significant because it also states that ARFF departments are requiring their officers to complete the same requirements that ARFF Firefighters are doing which are useful from a leadership perspective (lead by example and do everything that your personnel do) but does not address the specific skill sets that set officers apart from their firefighter

counterparts. As this research question was developing, the researcher worked to understand why each ARFF department did that what they did with respect to requiring their officers to either complete their requirements, not complete the requirements or partially complete the requirements. Again, the answers were somewhat surprising in that they stated that they wanted to ensure that the officers were meeting the same requirements as the firefighters but also that in their mind that everyone still needed to complete the requirements, regardless of rank or level within their respective departments.

In addition to discussion on ARFF departments and their stance on requiring ARFF required training from the regulatory documents, the second survey question that was used to answer this research question was the inquiry to the respondents on what kind of training they do for the unit and command officers. The answers that were provided provides the believe that ARFF Departments are willing to require and provide the avenues for their officers to accomplish developmental benchmarks as they progress in their careers. This was true especially with the elements of Fire Officer I through IV achievements which are widely believed the best practices of the United States Fire Service for officer-related training mentioned several times. Additionally, survey question #3 of the survey inquired of departments were doing anything internally to train their officers in specific ARFF topics with more than half stating that they were. With this question, no follow-up information was provided to see what exactly they were in fact doing to present this training to their personnel. Question #4 of the survey also was positive in that every participant said they were complying with the requirements of NIMS in assuring that progressive levels of rank saw that the higher levels of NIMS were being completed. Coupling these two questions together also shows that ARFF Officers are being given something (all having NIMS) with some departments proving they are

doing training in ARFF related topics. The researcher feels that this is a sign that an impact would not be severe to a department should a regulatory standard be implemented for ARFF departments to follow and institute within their initial and recurrent training programs. A final aspect of this with respect to research question #1 is that this shows not only the need for a regulatory document but also the ability to bring uniformity and consistency to ARFF unit and command officers at our nation's ARFF departments.

Research question #2 of this APR wanted to look at what elements of training and education would be necessary for a regulatory document based on the opinion and expertise of a cross-section of current ARFF Officers that are based at the nation's airports. This particular question was relevant and necessary because it provides a background on what other ARFF officers believe may be needed in the establishment of a would-be regulatory document for IM/CCT. In all, thirty-four different topics were suggested as potential items for inclusion in the regulatory document. The top two topics that were mentioned were Mass Casualty Incident Management (MCIM) fourteen times, and Strategies and Tactics nine times. After those two topics, the remainder of the items mentioned were vast and far-reaching, which was somewhat disappointing. The next most mentioned topic was Active Shooter five times and after that, Communications in both large and scale settings three times. No other topic was mentioned more than two times with many being mentioned only once. The disappointing aspect of the topics mentioned was from the lack of vision that the respondents had in delineating the difference of a regulatory document that is currently in place to train ARFF Firefighters and a future document that is separate and stand-alone that would train current and would-be unit and command officers in the aspects of IM/CCT. Several of the topics that were mentioned are basic staples of other officer programs that should be principals within a fire officer's skill set.

Research question #3 of this APR looked at the barriers for implementation that would exist for ARFF Departments in their integration and usage of a regulatory document that adds an IM/CCT element to their training programs. This question was relevant based on the last time an ancillary training advisory circular was introduced and implemented to the United States ARFF industry. In 2010, the FAA introduced AC 150/5210-23 titled "ARFF Vehicle and High Reach Extendable Turret (HRET) Operation, Training and Qualifications" as supplemental training and operational document to the current list of regulatory documents (Federal Aviation Administration, 2010). This document is the second training related document that ARFF departments need to be concerned with respect to training, even if they don't have an HRET appliance in their department as it provides best practices for all ARFF vehicles. This document was created following the Philadelphia UPS 1308 DC-8 cargo aircraft fire in 2006 at the recommendation of the NTSB as deficiencies and failures were noted as part of that incident that destroyed the aircraft and nearly killed three crew members because of Philadelphia Fire Department's inability to make access to the aircraft and the failure to timely pierce the aircraft and place extinguishing agent inside the aircraft.

Regarding research question #3, the survey instrument for this ARP wanted to gauge how a regulatory document would be received by the participating ARFF Officers. Survey question #10 inquired if ARFF Departments would welcome a document such as one that regulates and ensures completion of IM/CCT for ARFF Officer and if it would help a department's training plan. The response to this was extremely favorable, and of the twenty-nine participants, twenty-six (89.6%) stated they would be for some sort of regulatory document that required initial and recurrent IM/CCT. This data point was interesting and favorable to the researcher because of the belief that more regulatory guidance would not always be welcome, especially from those that

already feel the heavy burden of having to complete (or feel like they have to complete) the task of required annual training as set forth by the FAA and OSHA with sometimes minimal resources. Having an overwhelming response to this question shows a willingness from the cross-section of respondents to at least be open-minded to the notion a regulatory document requiring annual officer-related training is a good thing for the organizations. It also possibly demonstrates that some new doors can be opened to get personnel enhanced skill sets that they may not have but are crucial in an airport-related emergency or the ability to provide a refresher avenue for those that do. The additional aspect that survey respondents stated they would welcome a document such as this helps to show that buy-in may be present as it stands today, and once it goes into play, later on, it can be used to show that the industry thought it was a good thing.

The second part of research question #3 came from survey question #11 and addressed the barriers for implementation of such a document. The researcher believed that while the industry would likely be for an IM/CCT training document, there are always barriers that help to stall the process or create negativity for its final implementation. The gauge that this was favorable help to show early on that support was present for it. Just as it was for research question #1 and the potential training topics, a litany of barriers was provided by the twenty-nine participants. The most substantial barrier that was proposed was funding and was mentioned ten times. Certainly, this is a factor when any new procedure or program is implemented and must be accounted for. The second most cited barrier to this document, as indicated by the survey respondents were the resources and/or time it takes to implement and develop. This barrier is also a relevant and a genuine issue as the survey respondents did not see the draft document in advance but would require them to evaluate their respective training program and quite possibly

have to acquire the resources and build a training curriculum based on the IM/CCT document. As a resource to help with the development phase, the researcher hopes to provide some skeleton lesson plans and PowerPoint presentations to help lessen the early burden this regulatory document will bring to Chief and/or Training Officers who will be responsible for having to implement this in their respective departments. The third most mentioned barrier that was mentioned four times was that there would be no barriers to this document (likely because it would be federal mandate) in its implementation which speaks volumes to the fact they MAY have believed it would be easy or reasonably painless to institute in their organizations (also without seeing the draft document). The remainder of the answers provided were documented as well and for the most part, are typical in how many of the current barriers of anything that is done in the fire service usually go and surround that cultural barriers exist, union/labor agreements would stand in the way, less control over the curriculum they provide or the inability to get their mutual aid partners to engage further or even sit-down and comply with it.

The final aspect to research question #3 was the desire to see if the ARFF department is currently doing anything towards refresher training as it relates to IM/CCT. Survey question #5 asked respondents if they are currently doing any refresher training with respect to IM/CCT (the question did not delineate if it was specific to ARFF or if it was anything in particular). The answers that were provided were relatively positive and show that more than one-third of the respondents answered that they do something related to refresher training in IM/CCT. This is evidence that something is being done to help them practice their craft, albeit slight as it may be. This question is relevant to the third research question because it helps to explain the buy-in that will be needed because the regulatory document discusses the need for incident simulation of some kind as part of the initial and recurrent training programs and if departments are already

doing something related to this, it may be much easier for them to implement.

A final note in this discussion section was the absence of smaller airports in this APR and how it would affect their particular training programs. While the survey instrument was utilized to capture information that could be easily replicated from C through E sized airports, the A's and B's would be just as much impacted by the implementation of a regulatory document such as this into the mainstream ARFF operations at the five-hundred and twenty-four indexed airports in the United States. Typically speaking, the A and B index airport ARFF departments are smaller in comparison their C-E counterparts and often times are utilized to do other jobs such as maintenance, airfield operations, wildlife, and fueling. The implementation of a document such as this would be a massive undertaking but should not be minimized due to their smaller staffs and the multitasking that takes place and is no less dangerous or risk adverse to fly into a smaller airport (that can also get any size aircraft that is capable of taking off and landing at that airport). To aid all of the ARFF Departments in this endeavor with particular emphasis on assisting the A and B index airports, generic training curriculums that be easily customized for the specific airports should be built and made available for easy implementation and usage.

Recommendations

Recommendation #1: *Creation and adoption of a stand-alone regulatory document requiring Initial and Recurrent ARFF Incident Management/Command & Control Training for ARFF Unit and Command Officers.* The only recommendation of this ARP is to advocate for the implementation of a stand-alone ARFF Incident Management/Command & Control training document to the FAA. While the initial recommendation from the ARFFWG was to amend the current FAA 150/5210-17C Advisory Circular to include IM/CCT to the existing document, the researcher felt it was better to create a stand-alone document that would provide a better

framework and guidance to ARFF departments in the training of their unit and command officers for airport-related incidents. As the final document was developed, the document evolved into more than just a set of requirements that must be completed into an all-encompassing professional development document that can be utilized for ARFF Departments to go beyond the merely meeting annual requirements in IM/CCT and comprehensively build their members out for the benefit of their organizations.

In early August of 2019, an initial draft document outlining IM/CCT training benchmarks was submitted to the ARFF Specialist at the FAA. With some changes and enhancements (along with some information as provided by this research) to the document by the researcher, a second draft was submitted to the FAA in December of 2019. Currently, the draft document is awaiting final approval from the ARFF Specialist and then it will hopefully move through the approval process of the FAA. There is no timetable on when the draft document might see final approval but the document is in the que to hopefully be implemented.

With the above recommendation, the following is offered as a draft regulatory document for review and adoption by the FAA:

U.S. Department of Transportation

Federal Aviation Administration

Advisory Circular

Subject: Incident Management/Command & Control Training for Aircraft Rescue and Firefighting Personnel-- DRAFT

Date: 12/1/2019

Initiated By: AAS-300

AC No: 150/5210-XXX

Change:

1 **Purpose.**

This Advisory Circular (AC) provides information on courses and reference materials for Incident Management/Command and Control training of Aircraft Rescue and Firefighting (ARFF) officers or personnel who are placed into leadership positions during ARFF incident and events.

2 **Application.**

The Federal Aviation Administration (FAA) recommends the guidelines and standards in this AC for ARFF Incident Management/Command and Control training programs. In general, use of this AC is not mandatory. However, for airports certificated under Title14 Code of Federal Regulations, Part 139 (14 CFR part 139), this AC is required. The standards contained in this AC are meant to aid an airport's ARFF training program respective to the knowledge, skills, abilities and competencies that are needed for the critical functions of managing an aircraft or airport incident or event and establish minimum guidelines for the unit and command officers.

3 **Cancellation.**

None- this is a new document.

4 **Principal Changes.**

None- this is a new document.

5 **Copies of this AC.**

This AC and the current Addendum of training facilities is available online at http://www.faa.gov/airports/resources/advisory circulars/.

CHAPTER 1. REQUIREMENTS FOR CERTIFICATED AIRPORTS

1.1 **Introduction**.

14 CFR Part 139.319 (i) requires that each holder of an airport operating certificate ensure that firefighting personnel are properly trained to perform their duties. This AC provides a method for meeting this provision, and lists the minimum requirements for incident management/command and control training programs. Proficiency is the key to a successful ARFF training program as it relates to critical incident management and command and control skills, but this guidance is not intended to serve as a source of proficiency standards for personnel who may find themselves in a command role during an airport or aircraft incident. Instead, it is provided to assist the airport sponsor in establishing and ensuring an adequate training program that encompasses competency standards for incident management and command and control are met. The number of hours of training required will vary from individual to individual and from rank to rank. The FAA recommends a comprehensive, continuous, ongoing, and robust training program that regularly tests and challenges personnel to demonstrate continued competency. It should encompass not only the subjects specified in this AC but also those additional areas of special interest defined in any local Standard Operating Procedure (SOP), Memorandum of Agreement (MOA), Memorandum of Understanding (MOU), and Standard Operating Guideline (SOG). At a minimum, annual recurrent training must occur for all ARFF officers on a recurring basis at least **once every 12 consecutive calendar months (CCM).** (See CertAlert 10-01 for an interpretation of the term "consecutive calendar months" as used in part 139, Certification of Airports, available at http://www.faa.gov/airports/airport_safety/aircraft_rescue_fire_fighting/.)

1.2 **Personnel requiring Incident Management/Command & Control Training-Definition**

1.2.1 While rank structures are unique to each department based on the personnel that are on duty each day, typically speaking any qualified person who could fill a role as an initial incident commander or any other role with in the incident command system (ICS) on an incident would be responsible for completing initial and recurrent training in this area. The successful outcomes of incidents are often judged based on the skill sets that unit and command officers have prior to the incident taking place. Therefore, ARFF Departments are encouraged to complete a comprehensive review of their departments and determine which personnel could fall into this category and react accordingly. The following examples (which are not all encompassing) depict examples in which ARFF departments would provide incident management/ command and control training for their personnel:

- Any officer within an ARFF Department that serves as a command officer for incidents or events taking place on the airport. This could be a chief officer (Battalion Chief, Division Chief, District Chief etc.) or other type of officer (Captain, Lieutenant, etc.) who is the in charge of the ARFF operation on any particular day but also any other officer who could arrive at the incident such a training officer or other staff officer;
- If an ARFF Department has an engine or truck company on their respective airport

and the unit officer (Lieutenant, Captain, Firefighter) would be assigned the role of the Fire Attack or Rescue Group Supervisor (as an example), then they should receive incident management/command and control training as it relates to their respective role(s);

- If an ARFF department has personnel who participate in the emergency medical services (EMS) portions of the ICS framework in the EMS Group or EMS Branch, then they should receive training respective incident management/ command and control training;
- If an ARFF department has a command officer on the airport (Battalion Chief, Division Chief, Deputy Chief etc.) and move-up personnel are utilized to fill this position in the absence of that officer, then they should receive the training respective to their current position and any acting or move up position;
- If the on-airport fire department receives personnel who could fill ICS positions during an incident from off-airport organizations, they too should receive training commensurate to all of their respective duties. For example, if an on-airport department initially uses an officer (Lieutenant, Captain, Battalion Chief etc.) as its incident commander and expects/anticipates an off-airport chief officer to merge into the ICS framework or assume command on arrival, they should receive training in the management of that incident and be familiar with the respective airport emergency plan. If the off-airport chief could be placed into the Operations Section Chief or Division or Group Supervisor roles, then training should be provided for those roles in strategies and tactics of an ARFF incident.

1.3 **Training Schedule.**

1.3.1 Initial Training.

At the initial entry rank to the ARFF department, all personnel are required to comply with the training requirements for the National Incident Management System (NIMS) and Homeland Security Presidential Directive HS-5 of 2003. Personnel who enter a department are required to complete NIMS 100, 200 and 700. As personnel work toward progressive levels of responsibility, IS-800 and ICS-300 & 400 are required to be completed for their respective positions. Additional training is highly recommended for personnel who could interact or serve in Emergency Operations Centers (as appropriate) to better prepare themselves for large scale types of events that involve the airport and aid in the recovery.

Course #	Course Title	Hours	Online	Entry Level (General Personnel)	Mid-Level (Command Staff)	Senior Level (Incident Managers)	Executive Leaders
IS-700	NIMS, An Introduction	2-3	Yes	X	X	X	X
ICS-100	Introduction to ICS	2-3	Yes	X	X	X	X
ICS-200	ICS for Single Resources and Initial Action Incidents	2-3	Yes		X	X	X
IS-800	National Response Framework, An Introduction	2-3	Yes		X	X	X
ICS-300	Immediate ICS for Expanding Incidents	24	No		X	X	X
ICS-400	Advanced Incident Command	16	No			X	X
G-191	Incident Command System/ Emergency Operations Center Interface	8	No		X	X	
G-775	Emergency Operations Center Management and Operations	24	No		X	X	

More information on the NIMS Training program can be found at:
https://www.fema.gov/national-incident-management-system

1.3.2 Before ARFF Officers assume any supervisory duties, they should complete task specific training that will prepare them when placed into a role requiring incident management and command and control skill sets. It is not acceptable to simply take ARFF personnel and place them into supervisory positions based solely on their previous ARFF initial and recurrent training (or structural supervisory experience) and without the necessary additional training that officers should be receiving. The training curriculum must include current instruction in at least the areas listed in 1.4.1 through 1.4.10 below.

1.3.2.1 Initial training is that training provided to enable personnel to identify and interpret advanced theories, facts, concepts, principles, requirements, procedures, equipment, and components of incident management/ command and control ARFF incidents. Trainees must also be able to apply these principles to the aircraft serving the airport as well as the other target hazards that are found on the respective airfields and demonstrate all required tasks safely and accurately and in accordance with established procedures. The goal is to provide sufficient training and instruction such that ARFF officers can function well as part of a team.

1.3.2.2 Initial training is not complete until individuals have finished all basic training as listed below in 1.4.1 through 1.4.10.

1.3.3 **Recurrent Training.**

1.3.3.1 Once ARFF officers have completed initial training, they must receive recurrent instruction **every 12 consecutive calendar months (CCM).** Recurrent training is defined as that training provided as often as necessary but at least once every 12 CCM to enable ARFF Officers to maintain a satisfactory level of proficiency. Appropriate frequencies for recurrent training will vary from airport to airport and from one officer to another. Training in several areas will require coordination and should take place with other organizations and stakeholders on the local airport, and mutual aid agencies.

Note: The ARFF training curriculum should be approved by the ARFF Chief and available for inspection by the FAA airport certification safety inspector during an inspection.

1.3.4 Frequency of Training.

Recurrent training must be completed each year within a 12 CCM period. If the training is not conducted during the 12 CCM period, the officer and the airport will be out of compliance with Part 139 **if the officer works any assigned ARFF shift.** To remain in compliance, airports with officers who miss training for any reason, such as injury, deployment, or other circumstances, must not be assigned ARFF response duties until their training is current.

1.3.4.1 In addition, the CCM period can differ for the recurrent training and the drill training. For example, firefighters who completed the last cycle of recurrent training on December 5, 2018, have until December 31, 2019, to complete the next round of recurrent training.

1.4 **Training Curriculum.**

1.4.1 Incident Command System (ICS) and National Incident Management System (NIMS).

The program should train ARFF Officers so they can do the following:

1. Identify the various levels and training requirements of NIMS under the HSPD-5;
2. Identify and understand the Incident Command System (ICS) to be utilized in an emergency or event, according to the National Incident Management System (NIMS) or the airport emergency plan (AEP);
3. Identify and demonstrate proper terminology when utilizing ICS for incidents and events;
4. Demonstrate the proper procedures for establishing command, transferring command and terminating it;
5. Demonstrate the proper procedures for building ICS structures utilizing NIMS principals;
6. Demonstrate principles and practices of establishing Unified and Area Commands as they relate to their organization;
7. Demonstrate knowledge on the procedures that lead to their interaction with the

Emergency Operations Center (EOC) for their organization (if applicable);
8. Demonstrate knowledge of information dissemination procedures via a Public Information Officer (PIO) and/or Joint Information Center (JIC);
9. Demonstrate knowledge of demobilization procedures;

1.4.2 Familiarization with Regulatory Requirements for ARFF Departments.

The program should train ARFF personnel so they can do the following:

1. Demonstrate an understanding for the various index's there are within 14 CFR 139.315 including the aircraft length for each index and the associated vehicles and agents that are required for each index;
2. Demonstrate an understanding for the notification process when the local fire department falls below index;
3. Demonstrate an understanding for the training and exercise requirements in 14 CFR 139.319 and associated advisory circulars 150/5200-13 (current edition), 150/5210-17 (current edition) and 150-5210-23 (current edition);
4. Demonstrate (if applicable to the local fire department) an understanding of the fueling requirements and regulations for fueling operations on the airport;
5. Demonstrate an understanding of the various extinguishing agents that are required by ARFF departments, their required testing and flowing and the proper cleanup and re-service of the agents once they have been flowed;
6. Demonstrate an understanding of the required paperwork for the annual inspection process of the airport with FAA, FEMA and OSHA (if necessary) required items;

1.4.3 Familiarization with Fire Officers duties under the Airport Emergency Plan.

The program should train ARFF personnel so they can do the following:

1. Identify airport pre-fire and emergency plans;
2. Identify various types of aircraft-related emergencies;
3. Identify the procedures to use to size-up a given aircraft accident/incident;
4. Identify and understand individual duties as described in the AEP; and
5. Identify the other duties of his/her organization under the AEP.

1.4.4 Emergency Communications Systems on the Airport, including Fire Alarms.

The program should train ARFF personnel so they can do the following:

1. Demonstrate the use of communication equipment used by their organization;
2. Demonstrate knowledge of the phonetic alphabet;
3. Identify radio frequencies and channels used by their organization and mutual aid organizations;
4. Identify the procedures for receiving an emergency alarm;
5. Identify procedures for multiple alarms and mutual aid;
6. Demonstrate the proper procedure for obtaining clearance from the ATCT or other responsible authority for apparatus movement;
7. Identify emergency light gun signals used by the ATCT;
8. Demonstrate the use of standard hand signals used to communicate with aircrew personnel;

9. Give an initial and on-going status reports for a simulated aircraft accident; and
10. Identify the local method used to communicate with aircrew personnel.

1.4.5 Firefighting Operations- Strategies & Tactics.

The program should train ARFF personnel so they can do the following:

1. Describe departmental standard operating procedures (SOPs) for various emergency scenarios;
2. Select strategy and tactics for incident control and termination;
3. Identify the procedures for securing and maintaining a rescue path;
4. Identify the proper procedure to use when protecting an aircraft fuselage from fire exposure;
5. Identify the procedures to use when providing protective streams for personnel;
6. Identify procedures for controlling runoff from fire control operations and fuel spills;
7. Identify the procedures to use to stabilize aircraft wreckage;
8. Identify interior aircraft ventilation procedures;
9. Identify interior aircraft attack procedures;

1.4.6 Rescue and Firefighting Personnel Safety.

The program should train ARFF personnel so they can do the following to reduce the risks associated with their duties:

1. Identify the hazards associated with aircraft rescue and firefighting;
2. Identify the hazards to personnel associated with aircraft and aircraft systems;
3. Identify the potential stress effects on emergency services personnel involved in a mass casualty situation;
4. Identify the purpose and limitations of approved personal protective clothing used locally;
5. Demonstrate the inspection process for Protective Ensembles—proximity suits and/or structural firefighting turnout gear;
6. Demonstrate the ability to properly put on and take off personal protective ensembles;
7. Identify the purpose, components, operation, and limitations of self-contained breathing apparatus (SCBA);
8. Demonstrate the inspection process for the SCBA;
9. Demonstrate changing the air supply cylinder of a team member with an exhausted air supply cylinder;
10. Demonstrate proper putting on and taking off of the SCBA;
11. While wearing a SCBA, demonstrate the actions to take when the following emergency situations occur:
    a. low air alarm activates,
    b. air supply is exhausted,
    c. regulator malfunctions,
    d. face piece is damaged,
    e. low pressure hose is damaged, or
    f. high pressure hose is damaged;

12. While wearing a SCBA, demonstrate the actions to take to assist a team member experiencing the following emergency situations:
    a. low air alarm activates,
    b. air supply is exhausted,
    c. regulator malfunctions,
    d. face piece is damaged,
    e. low pressure hose is damaged, or
    f. high pressure hose is damaged;
13. Identify techniques for protection from communicable disease hazards; and

1.4.7 Familiarization & Utilization of Mass Casualty Incident Management (MCIM).

The program should train ARFF personnel so they can do the following:

1. Identify and demonstrate knowledge of the department's procedures for the management of a mass-casualty event;
2. Demonstrate the ability to initiate and build out the MCIM elements of NIMS as they relate to a mass-casualty incident;

1.4.8 Dangerous Goods/Hazardous Materials Incident Management.

The program should train ARFF personnel so they can do the following:

1. Identify the hazards indicated by each Department of Transportation (DOT) and International Civil Aviation Organization (ICAO) label;
2. Identify the limitation of the DOT and ICAO classifications and labeling system;
3. Identify local procedures in the event of a HAZMAT situation requiring a HAZMAT response;
4. Identify the procedures for contacting and using the Chemical Transportation Emergency Center (CHEMTREC) and other resources to obtain information about a hazardous material;
5. Using information obtained from the DOT Emergency Response Guidebook (ERG) and CHEMTREC, identify the appropriate response, including risk assessment and rescue or evacuation requirements, for a given situation involving hazardous materials;
6. The program should train ARFF personnel so they can identify the Notification to Captain (NOTOC), Pilot Notification Form (PNF), or Applicable Cargo Waybill Listing Dangerous Goods Carried by the Aircraft;
7. Demonstrate the ability to have an understanding, work with, and develop an Incident Action Plan (IAP) as it relates to a hazmat incident.

1.4.9 Strategic and Tactical Proficiency of ARFF Incidents

The program should train ARFF Officers so they can do the following:

1. Utilizing departmental procedures and industry best practices for the management and mitigation of ARFF incidents, demonstration of strategic and tactical proficiency of ARFF incidents shall be performed. This demonstration can be accomplished in number of ways such as via a command lab or with computer simulated software, wipe board drills

simulating incidents with other departmental personnel or via other methods such as hands on practical evolutions that are being conducted as part of the annual live fire training refresher for example. The main purpose is for ARFF officers to periodically practice their craft to ensure readiness for airport or aircraft related events and incidents;
2. Demonstrate proper size up procedures and properly communicating that size up to other responding personnel and apparatus;
3. Demonstrate the principals of life safety, incident stabilization, property conservation and society restoration (LIPS) in the management of airport or ARFF related incidents and events;
4. Demonstrate the use of incident tracking and personnel accountability to encompass incident progress and benchmarks;
5. Demonstrate the ability to safely minimize the disruption to the airport and work toward getting the airport back up and running following an incident or event.

**Appendix B of this guidance provides examples of proficiency skill check off sheets for initial and recurrent training.

1.4.10. Additional Training

The program should train ARFF Officers so they can do the following:

1. If the airport emergency plan calls for ARFF personnel to respond to special situations, such as structural firefighting emergencies, water rescues, other modes of transportation or technical rescues, the ARFF department should provide incident management and familiarization training specific to those such situations or events. While these are not ARFF specific, they likely do impact the respective airport and providing training in this area will undoubtedly be beneficial for the department's officers.

1.5 **Officer Certification.**

1.5.1 National Fire Protection Association (NFPA) Certification.

NFPA certification is not required by 14 CFR Part 139, but it would be a worthwhile goal of a training program to enable personnel to meet proficiency criteria as detailed in NFPA 1021, *Standard for Fire Officer Professional Qualifications.* The NFPA 1021 series is broken into four separate chapters that provide task specific job performance requirements (JPR's) for fire officers to better perform at their respective levels. The four levels are Fire Officer I which addresses supervisory tasks; Fire Officer II which addresses supervisory and managerial tasks; Fire Officer III which addresses managerial and administrative tasks and Fire Officer IV which addresses administrative tasks. These courses do not provide specific tasks requirements to ARFF Officers but do provide information and knowledge to better prepare individuals in doing their jobs. The NFPA 1021 series is a baseline best practice and is a national consensus standard with respect to the training of fire officers. The NFPA Technical Committee on Fire Fighter Professional Qualifications developed the standard. Copies of NFPA 1021, latest edition, may be ordered from NFPA at the address in the Appendix. Once candidates have completed the

four levels of progression, they should seek to obtain national certification from Pro Board (http://www.theproboard.org/) or IFSAC entities (http://www.ifsac.org/).

1.6 OSHA 1910.120 Hazardous waste operations and emergency response

1.6.1 Hazmat Incident Commander Qualification

While airports vary in sizes and complexities, all have at least a minimal hazardous materials and dangerous good presence on their respective airports. OSHA 1910.120 (q)(6)(v) requires personnel who are placed into a command role beyond the first responder awareness level to be qualified to command the incident based on this regulation. ARFF Officers that integrate or assume command of a hazardous material or dangerous good incident will need to be qualified to this standard. Furthermore, most aircraft related incidents involve at least the potential of a hazardous materials presence and the knowledge skill base of possessing this qualification will benefit ARFF officers at their respective airports. The requirements for satisfactorily meeting the requirement of OSHA 1910.120 (q)(6)(v) are listed below:

1910.120(q)(6)(v) : *On scene incident commander*. Incident commanders, who will assume control of the incident scene beyond the first responder awareness level, shall receive at least 24 hours of training equal to the first responder operations level and in addition have competency in the following areas and the employer shall so certify:

- 1910.120(q)(6)(v)(A): Know and be able to implement the employer's incident command system.
- 1910.120(q)(6)(v)(B): Know how to implement the employer's emergency response plan.
- 1910.120(q)(6)(v)(C): Know and understand the hazards and risks associated with employees working in chemical protective clothing.
- 1910.120(q)(6)(v)(D): Know how to implement the local emergency response plan.
- 1910.120(q)(6)(v)(E): Know of the state emergency response plan and of the Federal Regional Response Team.
- 1910.120(q)(6)(v)(F): Know and understand the importance of decontamination procedures.

The OSHA regulation following training and certification for emergency responders in OSHA 1910.120 can be found at the following link: https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.120#1910.120(a)(1)

1.7 ARFF Department Professional Development

The International Association of Fire Chief's (IAFC) has worked to provide a guide to streamline the fire officer development for the nation's fire officers. The IAFC Officer Development Guide (2nd edition) has been widely implemented by the United States Fire

Service as the model for professional development starting at the junior fire officer level up through the executive fire officer level. In an effort to establish and streamline the various levels of ARFF Training and provide for a linear progression, the ARFF Working Group has developed the ARFF Professional Development Framework Handbook to assist ARFF Departments in the progression from ARFF Firefighter through ARFF Executive Fire Officer. This framework includes four steps of progression as a career ladder along with a model for job specific training and education for each level using new and existing course work to enhance previously learned skills sets. The ARFF Professional Development Framework manual is scalable and can to be used in ARFF departments of all sizes and rank structures with the department leadership implementing the various elements as they see fit. This manual is available to airport fire departments through the ARFF Working Group and provides a best-practice guide for departments that lack or want to supplement their respective professional development programs.

1.8 **ARFF Officer Related Training Materials**

In an effort to assist with the training benchmarks in this AC, the ARFF Working Group has developed several curriculums that are available for download as part of membership of the organization. The materials as provided by the ARFF Working Group are periodically reviewed and updated as necessary and can be tailormade for initial and recurrent training programs for ARFF departments that desire to utilize it. In this area, ARFF departments can find course work that can be used in part or whole in basic and advanced ARFF and ARFF Officer related topics.

1.9 **Mutual Aid Agreements.**

Where mutual aid agreements exist with U.S. Air Force personnel and/or municipal fire services surrounding the airport, all parties should participate in regular incident management and airport familiarization training as it relates to aircraft/airport incidents. In connection with such mutual aid agreements, the U.S. Air Force encourages and extends the use of Air Force base training facilities to surrounding municipal fire organizations, as explained in Air Force Regulation 32-2001, *Fire Protection and Prevention Program.*

1.10 **Non-certificated Airports.**

There are no regulatory requirements for ARFF services at non-certificated airports. However, the FAA recommends at those airports that have ARFF coverage, or for fire departments that have airport responsibility, the use of this AC.

APPENDIX A. RELATED READING MATERIALS

A.1 **Regulations.**

1. 14 CFR Part 139 (Part 139), *Certification of Airports.*

A.2 **Advisory Circulars.**

The ACs listed below can be found at http://www.faa.gov/airports/resources/advisory circulars/. See current versions.

1. AC l50/5200-12, *First Responders' Responsibility for Protecting Evidence at the Scene of an Aircraft Accident/Incident.*
2. AC l50/5200-18, *Airport Safety Self-Inspection.* Contact FAA Regional Airports Office for associated DVD.
3. AC 150/5200-31, *Airport Emergency Plan.*
4. AC 150/5210-6, *Aircraft Fire and Rescue Facilities and Extinguishing Agents.*
5. AC I50/5210-7, *Aircraft Rescue and Firefighting Communications.*
6. AC 150/5210-13, *Airport Water Rescue Plans and Equipment.*
7. AC 150/5210-14, *Aircraft Rescue Fire Fighting Equipment, Tools and Clothing.*
8. AC 150/5210-17, *Programs for Training of Aircraft Rescue and Firefighting Personnel*
9. AC 150/5210-19, *Driver's Enhanced Vision System (DEVS).*
10. AC 150/5210-23, *ARFF Vehicle and High Reach Extendable Turret (HRET) Operation, Training and Qualifications.*
11. AC 150/5220-17, *Aircraft Rescue and Fire Fighting (ARFF) Training Facilities.*
12. 150/5220-22, *Engineered Materials Arresting Systems (EMAS) for Aircraft Overruns.*
13. AC 150/5230-4, *Aircraft Fuel Storage, Handling, Training, and Dispensing on Airports.*
14. AC 150/5340-1*, Standards for Airport Markings.*
15. AC 150/5340-18, *Airport Signing and Graphics.*
16. AC 150/5340-30, *Design and Installation Details for Airport Visual Aids.*
17. AC 120-57, *Surface Movement Guidance and Control System.*

A.3 **Part 139 CertAlerts.**

The FAA has published a number of ARFF-related CertAlerts. A complete list as well as other ARFF resources are available at http://www.faa.gov/airports/airport safety/aircraft rescue fire fighting/.

A.4 **Other Resources.**

A.4.1 International Fire Service Training Association's (IFSTA's) Aircraft Rescue and Fire Fighting, 6th Edition.

The manual was developed to provide information for both airport and structural fire department officers to effectively accomplish the various tasks

involved in aircraft firefighting and rescue. It is designed for all types of fire protection organizations and includes the use of both conventional and specialized aircraft firefighting apparatus. Copies may be purchased from IFSTA at the following address:

IFSTA Headquarters
Fire Protection Publications
Headquarters for the International Fire Service Training Association
930 N. Willis
Stillwater, OK 74078
Phone: (405) 744-5723
Fax: (405) 744-8204
http://www.ifsta.org

A.4.2 ARFF Working Group

The ARFF Working Group is an international organization that is committed "to promote the science and improve the methods of aviation fire protection and prevention." The ARFF Working Group provides information, networking, and training materials to its members that serve at airports worldwide. The ARFF Working Group hosts several educational conferences each year for the benefit of ARFF Firefighters and Officers and the airports that they serve. Additional information on the ARFF Working Group can be found at:

ARFF Working Group
P.O. Box 1539 Grapevine, TX 76051
Phone: (972) 714-9412
Email: info@arffwg.org
http://www.arffwg.org

A.5 **Definitions and Acronyms.**

A.5.1 Definitions.

1. **Notification to Captain (NOTOC)** documentation acts as a flight manifest. This document has also been called the Notice to Pilot in Command (NOPIC) or the Pilot Notification Form (PNF). Each NOTOC contains a standardized list of hazardous materials and dangerous goods (for both non-radioactive and radioactive materials) that are loaded onboard an aircraft. It also lists their location, quantity, and type of packaging as well as procedures to follow in the event of an emergency situation. Every air carrier has its own version of a written form to notify aircraft crew members about dangerous goods (HAZMAT) that is loaded onboard the aircraft.

A.5.2. Acronyms

1. AC Advisory Circular
2. AEP Airport Emergency Plan

3. AOC	Airport Operating Certificate
4. ATCT	Air Traffic Control Tower
5. AIP	Airport Improvement Program
6. ARFF	Aircraft Rescue and Firefighting
7. ARFFWG	Aircraft Rescue and Firefighting Working Group
8. CCM	Consecutive Calendar Months
9. CertAlert	Certification Alert
10. CFR	Code of Federal Regulations
11. CHEMTREC	Chemical Transportation Emergency Center
12. CTAF	Common Traffic Advisory Frequency
13. DOT	Department of Transportation
14. EMT	Emergency Medical Technician
15. ERG	DOT Emergency Response Guidebook
16. FAA	Federal Aviation Administration
17. HAZMAT	Hazardous Materials
18. HOT	Hands-on Training
19. IAP	Incident Action Plan
20. ICAO	International Civil Aviation Organization
21. ICS	Incident Command System
22. IFSTA	International Fire Service Training Association
23. MOA	Memorandum of Agreement
24. MOU	Memorandum of Understanding
25. NIMS	National Incident Management System
26. NFPA	National Fire Protection Association
27. NOPIC	Notice to Pilot in Command
28. NOTOC	Notification to Captain
29. PPE	Personal Protective Equipment
30. PNF	Pilot Notification Form
31. SCBA	Self-Contained Breathing Apparatus
32. SOG	Standard Operating Guidelines
33. SOP	Standard Operating Procedures
34. TO	Technical Order

APPENDIX B. SAMPLE COMMAND & CONTROL PROFICIENCY SHEETS

Command Officer Command & Control Competency Checkoff

Candidate	
Training Number	
Date	

Section I: Roles & Responsibilities of the Battalion Fire Chief/Command Officer

□	Details the roles & responsibilities of the BFC on the response for assignments on both ARFF (as per the ARFF manual matrix) and non-ARFF events.
□	Details the roles & responsibilities of the other units without the BFC on the response for assignments on both ARFF (as per the ARFF manual matrix) and non-ARFF events.
□	Recites the stand-by positions for the BFC and the other apparatus for all four runway complexes: □ Runway 19R-1L □ Runway 19C-1C □ Runway 19L-1R □ Runway 12-30
□	Calling for clearance with the ATC based on random locations
□	Recites all applicable airfield rules & regulations
□	Recites all relevant procedures from the Emergency Services agreement with the FAA ATC (LOA)
□	Recites the triggers and procedure for requesting the discrete emergency frequency (DEF) for emergency incidents at
□	Recites the department, airport and FAA procedures for when the firefighting index falls below the requirements.

Section II: Incident Management/Actions

□	Utilizing specific ARFF events, the candidate will depict the positions and actions of all of the units on the following events when the BFC is present: □ Engine/Wheel Fire □ Alert III Crash or Fire □ Interior Fire/Smoke in the aircraft □ Fuel Spill
□	Escalating the assignment/Requesting additional resources- the candidate accurately and appropriately will detail the triggers that require that the incident requires or suggests an escalation/upgrade on the assignment based on the below assignments: □ Alert I to Alert III

	□ Alert II to Alert III □ Alert III to an MCI Box □ Alert III to a 2nd Alarm □ Fuel spill to Hazmat Box
□	Establishing command- the candidate accurately and appropriately establishes command that not only demonstrates a command presence but also gives the location of the command post and the command statement provides all required information.
□	Candidate accurately fills out the command board and tracks enough information to turn over to the DFC.
□	Candidate can accurately describe the procedure and duties for the BFC for Certification Test responses along with the response areas for the three stations as it relates to certification testing.

Notes:

Certification	Signature	Date
Candidate		
Battalion Fire Chief		
Deputy Fire Chief		

Twin Agent Driver/Operator Command & Control Competency Checkoff

Candidate	
Training Number	
Date	

Section I: Roles & Responsibilities of the Twin Agent Unit Officer

□	Details the roles & responsibilities of the TAU Officer with the Battalion Chief on the response for assignments on both ARFF (as per the ARFF manual matrix) and non-ARFF events.
□	Details the roles & responsibilities of the TAU Officer without the Battalion Chief on the response for assignments on both ARFF (as per the ARFF manual matrix) and non-ARFF events.
□	Recites the stand-by positions for the TAU for all four runway complexes: □ Runway 19R-1L □ Runway 19C-1C □ Runway 19L-1R □ Runway 12-30
□	Recites the stand-by positions for the other Foam Units on the four runway complexes: □ Runway 19R-1L □ Runway 19C-1C □ Runway 19L-1R □ Runway 12-30
□	Calling for clearance with the ATC based on random locations
□	Recites all applicable airfield rules & regulations
□	Recites all relevant procedures from the Emergency Services agreement with the FAA ATC (LOA)
□	Recites the triggers and procedure for requesting the discrete emergency frequency (DEF) for emergency incidents at
□	Completes fuel spill paperwork and is able to document the report in FH Software

Section II: Incident Management/Actions

□	Utilizing specific ARFF events, the candidate will depict the location of the TAU and its actions on the following events when the BFC is present: □ Engine/Wheel Fire □ Alert III Crash or Fire □ Interior Fire/Smoke in the aircraft □ Fuel Spill
□	Utilizing specific ARFF events, the candidate will depict the location of the TAU and its actions on the following events when the BFC is not present:

	□ Engine/Wheel Fire □ Alert III Crash or Fire □ Interior Fire/Smoke in the aircraft □ Fuel spill
□	Escalating the assignment/Requesting additional resources- the candidate accurately and appropriately will detail the triggers that require that the incident requires or suggests an escalation/upgrade on the assignment based on the below assignments: □ Alert I to Alert III □ Alert II to Alert III □ Alert III to an MCI Box □ Alert III to a 2nd Alarm □ Fuel spill to Hazmat Box
□	Establishing command- the candidate accurately and appropriately establishes command that not only demonstrates a command presence but also gives the location of the command post and the command statement provides all required information.
□	Candidate accurately fills out the command board and tracks enough information to turn over to the BFC or 1st Arriving Command Officer.
□	Candidate can accurately describe the procedure and duties for the TAU for Certification Test responses.

Notes:

Certification	Signature	Date
Candidate		
Battalion Fire Chief		

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Appendix A: Recommendations summary to NTSB Safety Recommendation A-14-61 following the Asiana 214 crash at San Francisco International Airport on July 6th, 2013 (National Transportation Safety Board, 2014, p. 132):

Recommendations

Summary of Recommendations:

- **Recommendation #1:** Establish an ARFF Awareness course for off-airport (mutual-aid) personnel;
- **Recommendation #2:** Establish NFPA 1003 as the initial, minimum baseline training standard for all airport-based personnel;
- **Recommendation #3:** Establish an Advanced ARFF Training Curriculum;
- **Recommendation #4:** Establish an ARFF Officer Training Course Curriculum;
- **Recommendation #5:** Establish an Executive ARFF Officer Training Course Curriculum;
- **Recommendation #6:** Encourage ARFF personnel at the nation's airports to complete the ARFF Professional Designation Program;
- **Recommendation #7:** Inclusion of Command & Control Training in the FAA AC 150/5210-17C Programs for Training of Aircraft Rescue and Firefighting Personnel;
- **Recommendation #8:** Creation of a standalone National Fire Academy (NFA) Command & Control Class for Transportation Incidents;
- **Recommendation #9:** Professional Development Model and Manual;

The recommendations outlined in this applied research project come in the form of two sets—one as curricula that can be used to enhance the professional development environment of ARFF professionals and the second, associated recommended regulatory adjustments that help to

encourage the implementation of these proposed best practices into the training frameworks of ARFF organizations.

Recommendation #1: *Establish an ARFF Awareness course for off-airport (mutual-aid) personnel:* The ARFF Working Group will provide an outline and generic PowerPoint presentations encompassing awareness level ARFF knowledge for off-airport resources that could be used as is or adopted (preferred) by Airport Fire and Rescue Departments to create their own outreach training programs. The materials will be available for members to download from the ARFF Working Group website with the expectation that the individual ARFF departments will use these templates to create their own airport and agency specific training programs for their usage in meeting this recommendation.

**See Appendix 1 for an outline of the program.

Recommendation #2: *Establish NFPA 1003 as the initial, minimum baseline training standard for all airport based personnel*: A model ARFF NFPA 1003 Curriculum Package is available to departments through the utilization of the IFSTA Aircraft Rescue Firefighting training curriculum at https://moodle.ifsta.org/.

**See Appendix 2 for an outline of the program.

Recommendation #3: *Establish an Advanced ARFF Training Curriculum:* A model Advanced ARFF Curriculum Package will be available for members through the ARFF Working Group Website.

**See Appendix 3 for the outline of the program.

Recommendation #4: *Establish an ARFF Officer Training Course Curriculum:* A model ARFF Officer Curriculum Package will be available for members through the ARFF Working Group Website.

**See Appendix 4 for the outline of the program.

Recommendation #5: *Establish an Executive ARFF Officer Training Course Curriculum:* A model Executive ARFF Officer Curriculum Package will be developed and available for members through the ARFF Working Group Website.

**See Appendix 5 for the outline of the program.

Recommendation #6: *Encourage ARFF personnel at the nation's airports to complete the ARFF Professional Designation Program:* Currently, the ARFF industry in the United States has the ARFF Professional Designation program to aid in recognition of the accomplishments of its members. The ARFF Professional Designation program demonstrates a commitment to the profession by completing the Aviation Master Firefighter (AMF) and Aviation Fire Officer (AFO) tiers. More information on the ARFF Professional Designation Program can be found at http://www.aaae.org/AAAEMBR/PD/AC/ARFF_Professional_Designation_Programs/AAAEMemberResponsive/PD/AC/ARFF_Programs/ARFF_Professional_Designation_Programs.aspx?hkey=081d5c86-fbe3-4c95-be23-105cf99cab6f

Recommendation #7: *Inclusion of Command & Control Training in the FAA AC 150/5210-17C Programs for Training of Aircraft Rescue and Firefighting Personnel:* In order for command and control training to be implemented and actually conducted for ARFF departments, it is recommended that FAA AC 150/5210-17 be amended to include language on the completion of NIMS related training but also task-specific command and control training related to aircraft and airport-related incidents.

Recommendation #8: *Creation of a standalone National Fire Academy (NFA) Command & Control Class for Transportation Incidents:* While ARFF is only one piece of the Nation's transportation system; it is an important cog within it. Transportation incidents have the ability to become complex and impactful to the jurisdictions that affect them. The ARFF Working Group would like to volunteer to work with the United States Fire Administration and the National Fire Academy to create a transportation-specific command and control class that would cross the entire spectrum of transportation-related incidents. This class would be featured along with its other command and control series of classes at both the National Fire Academy in Emmitsburg, MD and also as a handoff course, giving the ability for officers to hone their incident command skills in a simulated environment.

Recommendation #9: *Professional Development Model and Manual:* One final aspect that is lacking is a professional development model and manual to aid ARFF departments in the building of their own plans. The ARFF Working Group has worked to develop a framework manual that ARFF departments can use to build their own programs and tie in several of the recommended aspects previously discussed. Appendix 6 of this ARP shows relevant excerpts to this project from and includes the professional development ladder and the specific training and education crosswalk for the five levels. The draft of this document is under final review, with an anticipated validation and in-service date of June 2018. The goal of this manual is to give ARFF departments the ability to create specific professional development programs in a scalable format based upon their department size, rank structures, and/or airport indexes.

Appendix B: Survey Questions

QUESTIONS RESPONSES 29

J. Graber Year #3 Executive Fire Officer Survey-- ARFF Incident Management/ Command & Control Regulatory Document

Form description

Image title

Introduction/Background

Year #3 of the National Fire Academy's Executive Fire Officer Program is the topic of Executive Analysis of Fire Service Operations in Emergency Management. As part of the program, an applied research project (ARP) is a required to be successfully completed. For this ARP, I have selected regulatory documents that currently exist in the FAA and justify the need to have an Incident Management/Command & Control document for ARFF Departments to utilize in their training plans.

In addition to this, the ARFF Working Group (ARFFWG) has worked with the National Transportation Safety (NTSB) to develop a recommendation following the San Francisco Asiana 214 crash to advocate the need to have incident management and command and control topics included in current regulatory documents or in a stand-alone document.

While many of you have helped me out with previous surveys in this discipline, I am looking to collect a new data set and hopefully see some improvements in our industry with respect to this topic and justify having a all-encompassing document to better prepare us for a day we hope will never come.

1. Do you require your officers (any and all ranks) to comply with the requirements of Federal Aviation Administration (FAA) Advisory Circular 15-5210-17C document? *

- ○ Yes
- ○ No
- ○ Partial-- depends on the rank

If the answer was yes to Question 1, why do you require it?

Long answer text

If the answer was no to Question 1, why don't you require it?

Long answer text

If you answer Partial-- depends on the rank to Question 1, what breakdown do you make these requirements?

Long answer text

2. To what levels do your ARFF Officers complete officer related training (i.e. Fire Officer I-IV, NFA related classes, EFO, AMF/AFO)? *

Long answer text

3. Do you have any specific ARFF Officer related training programs in your department to train ARFF Officers (either formal or informal)? *

- Yes
- No

If the answer is Yes to Question 3, can you briefly explain the program(s)?

Long answer text

4. What levels do you require NIMS for your personnel? *

	NIMS 100	NIMS 200	NIMS 300	NIMS 400	NIMS 700	NIMS 800
Firefighters	☐	☐	☐	☐	☐	☐
Lieutenants/C...	☐	☐	☐	☐	☐	☐
Command Offi...	☐	☐	☐	☐	☐	☐
Deputy Chief/...	☐	☐	☐	☐	☐	☐
Fire Chief	☐	☐	☐	☐	☐	☐

5. Do you require your officers to complete any refresher training with respect to incident management or command and control training? *

- ○ Yes
- ○ No
- ○ We currently don't, but are exploring the option

6. Do you have any simulation or computer based software or programs that are utilized for simulation incident management/command and control training or have the ability to participate in a command lab type of experience? *

- ○ Yes
- ○ No

7. Assuming that your department allows for it, when an officer moves up either through promotion or short-term/long-term acting, do you require any additional qualifications for that person to be in that position specific to incident management or command and control functions? *

- ○ Yes
- ○ No

If the answer is yes to Question 7, can you elaborate on these qualifications?

Long answer text

8. Do you require your incident commanders and unit officers to be OSHA Hazmat IC qualified? *

- ○ Yes
- ○ No

9. If a regulatory document were to be implemented by the FAA to aid in the training of airport related officers in Incident Management/Command and Control functions for ARFF Officers and personnel, what topics would be included in that list such as Mass Casualty Incident Management or Strategies and Tactics? *

Long answer text

10. Would a document such as this be welcome in your department and aid in your department's training plan? *

- ○ Yes
- ○ No

11. What barriers would exist in the implementation of such a document for your department's training plan? *

Long answer text

12. Airport/Index *

Long answer text

13. Number of Officers & List of Ranks *

Long answer text

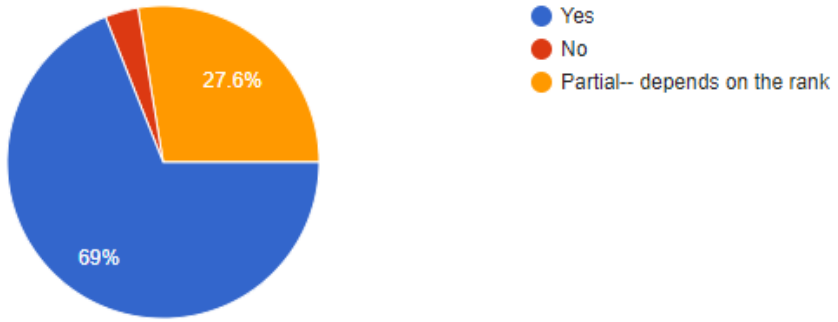
14. Number of Personnel *

Long answer text

Appendix C: Survey Results

1. Do you require your officers (any and all ranks) to comply with the requirements of Federal Aviation Administration (FAA) Advisory Circular 15-5210-17C document?

29 responses



If the answer was yes to Question 1, why do you require it?

24 responses

Airports certificated under Title14 Code of Federal Regulations, Part 139 (14 CFR part 139)

17C covers all aspects of ARFF and details all of the requirements needed to be proficient in this profession

I may not quite understand the question, but I don't believe there is a caveat for line officers to not follow it.

Because its required annual training

By adhering to this the inspector doesn't question anything

ACs are part of the 139 requirements

We are a certified airport and as such are required to follow the regulations in Part 139 and this AC..

It is required for Part 139 certificated airports.

Required by FAA and inspected annually

The information in AC 15-5210-17C breaks down and further defines the requirements of 14 CFR Part 139.139. For personnel providing ARFF coverage these training topics are not optional for certified airports and enforced by the FAA, therefore any personnel providing ARFF coverage must meet these annual training requirements.

Its a minimum training guide line established be the FAA that sets a standard we are held too. The only personnel who are required to meet this are the people who are assigned to the ARFF Station and units who support the ARFF Mission.

Because they all need to be knowledgeable and capable in ARFF and FAA requirements

Staffing requirements to meet Index

Consistency, and ability to move personnel within the system without downgrading qualifications

For compliance with the FAA
It is industry "best practices"
To make sure the inspector cannot question any of it.
PBCFR and PBIA require all ARFF personnel to be qualified/certified being we don't bring in floaters (only utilize personnel with ARFF bids assigned to PBIA)
It's best practice
Because all members are firefighters first and should meet the minimum requirements for training
required part 139 training to maintain service level of ARFF index staff
I view this and all other ACs as an extension and controlling factor of 14 CFR part 139. The AC provides a deep dive into the aspects needed to create the foundation of a well rounded training program.
We prefer to be on the leading edge of what the FAA has suggested and to encapsulate a complete training program.
Company officers assigned to airport station

If the answer was no to Question 1, why don't you require it? 3 responses

N/a
N/A
NA

If you answer Partial-- depends on the rank to Question 1, what breakdown do you make these requirements? 9 responses

Officers are given the basic OIC training though NIMS, however further educations is recommended, thru there own in site.
N/a
N/A
Chief Officers and above are not required to complete recurrent training. They do complete a command level initial training, but not the entire 80 hour class required for ARFF members. We recommend that they maintain their recurrent training...some do and some do not.
ARFF personnel (only) are required to do this, not structural
Only my Assistant Chiefs who will be in a IC role
NA
What we do is based on what are needs are and have found that there is not just one document of certification that fits all with ARFF with our Officers. For this reason we cherry pick what we need.
We require the Battalion Chief's and below to complete the training-- essentially anyone that is working in the field. We also encourage all of the chief's and HQ staff to complete the training to ensure they still know ARFF related items but also if they do need to fill a role in the field they are qualified.

2. To what levels do your ARFF Officers complete officer related training (i.e. Fire Officer I-IV, NFA related classes, EFO, AMF/AFO)?

29 responses

Fire Officer 1 for LT, Fire Officer 2 for Captains, NIMS 100,200, 700, 800, 300, and 400.

AMF

AMF, Va Fire Officer 2 Instructor 2 ICS 300-400

Members have gone through an in house officer development program for the rank they hold.

Company officer III is required

Fire Officer 1 & 2 is all the state recognizes

None

Fire Officer II, Blue Card Certification, some are AMF

It is currently encouraged that Company Officers hold FO I, Instructor I, and ICS 100,200,700,800. We also recommend that they attend the NFA Command and Control series courses.

Voluntary basis. We encourage completion of Fire Officer courses and help fund travel/training if possible. We encourage but do not fund AMF/AFO.

ARFF officers currently have no additional requirements other than that to be current as an ARFF firefighter and officer within the organization.

None reguired

None is required, but optional with no upper max of how far they want to pursue their knowledge, only requirement is basic ICS classes and local company officer training

All officers are required to obtain FO 1 and are encouraged to obtain FO 2. We are also running all of our staff through the AMF program and offering the AFO to those who request it. The NFA Leadership course is encouraged as well.

Fire Officer I

Captains complete Command level training and recurrent training for fire command throughout their careers. The only requirement is to pass the company officer exam. No certifications or programs are required.

State cert in Fire Officer one or above

FO I-IV series, NFA and AMF as requested individually

They are required to have Fire Officer 1

PBCFR only requires FO1 to sit for our BC exam. At a minimum, in order to sit for our Captains and/or ARFF Captains exams they must have Strategies and Tactics class and Company Officer. We are currently looking to pursue the AMF/AFO certifications

Own FD training. No or limited training as described in the question

FO III, AMF/AFO

FOII which is highest the state has.

none required, often begun at the initial line level, emphasized more as they advance.

Currently, we do not have any standard for ARFF Officers outside of the department's SOPs.

They aren't required to complete anything additional. as was mentioned.

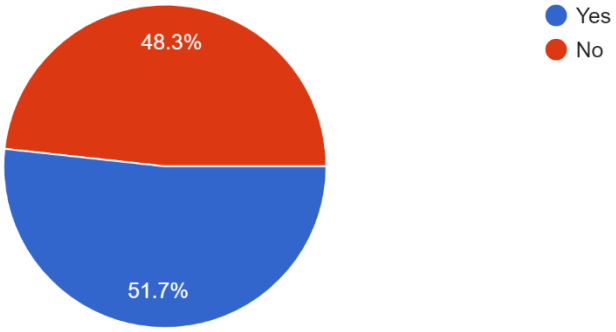
We use various educational and certificated agencies for officer training. We have in house work up books that all officers or potential officers much complete prior to moving to the next rank. They are based on industry standards as well as internal PRO's and SOG's.

Fire Officer related course, in-house command and control but really nothing specific to ARFF as of today.

Fire Officer

3. Do you have any specific ARFF Officer related training programs in your department to train ARFF Officers (either formal or informal)?

29 responses



If the answer is Yes to Question 3, can you briefly explain the program(s)?15 responses

see answer above...We have Tidewater EMS that offers the above classes (except AMF) on a regular basis.

we have a track system to work on an ARFF rig. FF's assigned to them must posses a ARFF crew member Certification, a Driver Operator Certification and an Company Officer certification. All are ARFF specific. company officers are not required to hold a driver operator certification, and engineers are not required to hold a company officer certification. In addition Captains/ Chiefs are required to hold an ARFF Chief officer certification. These Certs are all developed in house and are based upon NFPA,IFSAC,FAA, and Proborad documents.

We have a curriculum to train our officers but not the surrounding Fire Department Officers

We support their attendance at the DFW Fire Research Center Aviation Incidents and Comm and Control of Airport Emergencies classes.

When available, we try to send officers to ISO, or command leadership, ICS300/400, etc.

It is a checklist that is comprised to demonstrate knowledge and skills proficiency that are specific to the ARFF Officers role.

Internal 40-hour class, Target Solutions (online training program), JPRs

We have created a continuing education course for ARFF Chief Officers. Captains complete annually required Company Officer training (not all ARFF specific because they are also city structural).

Formally we have an Officer In Training program. Informally we have mentoring

After completing their 8 month evaluation/task book sign offs, our ARFF Captains and Operational Captains assigned to ARFF then must complete the ARFF Captain task book within 4 months. I can send you those task books/sign offs if you would like

Ongoing and recurrent, also fueler supervisors training (although we don't fuel)

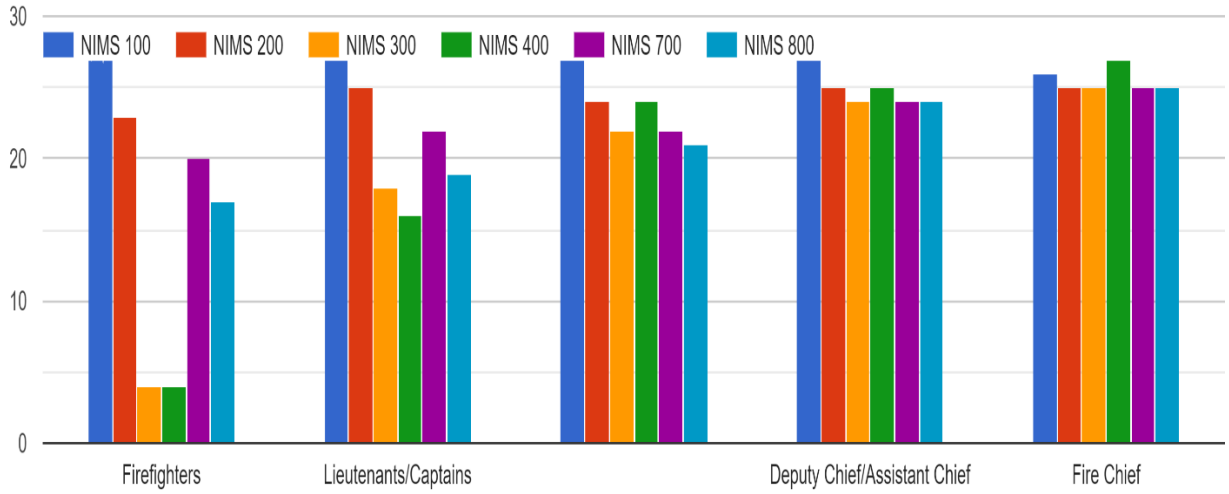
Beyond IFSTA books, we do local incidents/aircraft/considerations, as well as tactics based on what we have experienced in Alaska with our significant number of aircraft crashes.

We do have an informal training that goes a bit more in depth than what is provided in the circular.

Working towards implementing the ARFF Officer Course form the ARFF Working Group and attempting to get ARFF incident management related training for personnel.

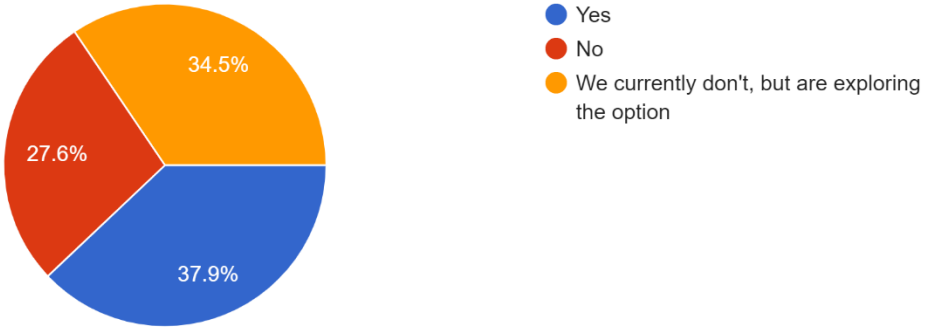
Task book

4. What levels do you require NIMS for your personnel?



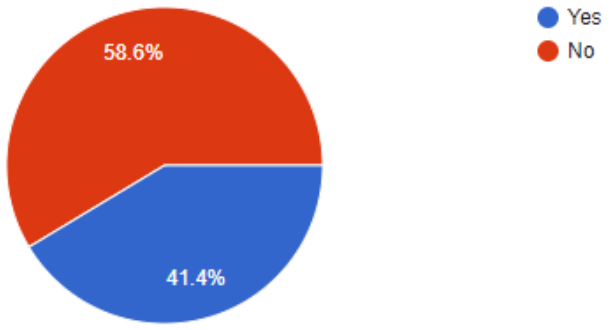
5. Do you require your officers to complete any refresher training with respect to incident management or command and control training?

29 responses



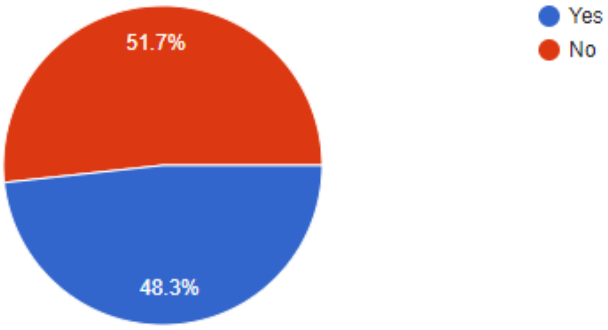
6. Do you have any simulation or computer based software or programs that are utilized for simulation incident management/command and control training or have the ability to participate in a command lab type of experience?

29 responses



7. Assuming that your department allows for it, when an officer moves up either through promotion or short-term/long-term acting, do you require any additional qualifications for that person to be in that position specific to incident management or command and control functions?

29 responses

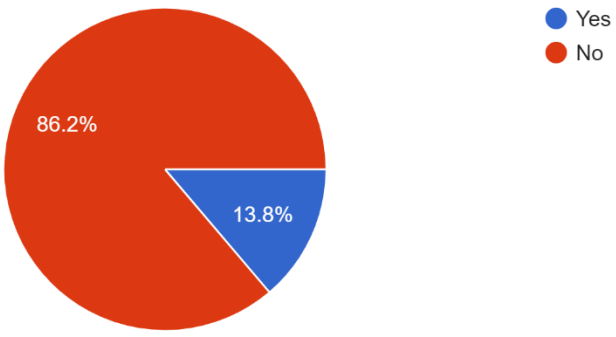


If the answer is yes to Question 7, can you elaborate on these qualifications? 15 responses

N/a
see above
For long term, when moving into an officer role from a firefighter role ICS 300, 400 are required. We only have one officer (Captains position) between Chief and firefighters.
We look at their past command experience in the structural environment
All personnel must complete a 40 hour class called "Eight Functions of Command.'" When they promote to Captain, they are required to complete the Blue Card certification. With that, there are required CE's and re-certification.
We require that they complete the Acting Captain Task Book prior to acting.
Require approximately 40 hours field training with senior command staff that covers local ICS procedures, and includes training response drills as incident commander.
we designate them as Qualified based on either promotional processes that have been passed, or by approval of the Command Staff
In order to be eligible to sit for our Battalion Chief exam, we require 48 months as a Captain (36 months for our Specialty Captains (ARFF, EMS, and Special Operations)), department protocoled paramedic, Associates degree, State certified Fire Inspector and Instructor, and FO 1
KCFD has a specific Captain's Academy for the next 15 people on the Captain's promotional list
When moving from captain to Assistant Chief FOIII is required
years of service at the department and an in-house training course on those duties, both as IC and as the general watch commander leading a shift.
In house work up book must me completed.
Each candidate has a task list or book that they utilize with a mentoring officer to get checked off on before they are "cleared" to ride in that position.
Task book completion

8. Do you require your incident commanders and unit officers to be OSHA Hazmat IC qualified?

29 responses



9. If a regulatory document were to be implemented by the FAA to aid in the training of airport related officers in Incident Management/Command and Control functions for ARFF Officers and personnel, what topics would be included in that list such as Mass Casualty Incident Management or Strategies and Tactics?

29 responses

Yes

Adaptable IC checklist that can be edited for any aviation incident, and be fillable with notes by IC command function. " Lets call it your rough draft incident report"

Communication, Span of Control, Mutual Aid teamwork

MCI Management (although we already constantly train that) We have extensive internal Table top and small (drill type) scenarios where we discuss Strategy/Tactics

Please don't add more to the FAA, They have it pretty well screwed up now.

ICS EOC Interface

All of the mentioned along with wide area search and how to grid a search field

Definitely what you have listed and include such topics as Airport Familiarization, Aircraft Familiarization, Movement Training, SIDA, and Part 139.

Mass Casualty, Multiple Alarm Structure Fires, Severe Weather Response

Mass Casualty Incidents, Strategies and Tactics, Unified Command, WMD or CBRN, Active Shooter for Fire Services.

ARFF Strategies and Tactics, Airport operations, Aircraft construction and systems, HazMat IC and additional fuel fire suppression considerations

Nothing to add.

Should be basic ICS/ Fire officer training with an ARFF specialty added

Any topic related to command and control would good. Having a document that outlines these topics would greatly help standardize officer training in ARFF.

Terrorism Response, MCI

Fuel handling, Fuel fires; Strategic Decision Making process - Risk Management; Mass Casualty, Command and Control of large scale incident (focus on communications); Size-up recognition for aviation incidents;

unk

Mass causality IM, Active Shooter IM, Large incident command and control, etc.

Strategies and tactics, we get an abundance of MCI training

Command and Control, Strategies and Tactics I and II

Hazmat, C & C, all 139 topics, Company Officer, Chief Officer,

Mass Cas incident management to include active shooter/terrorism

MCI, NIMS, Tactics 1 & 2, Health Safety Officer, Hazmat Ops and IC

Mass Casualty, Recovery, Large-Scale Incident Communications, last one is super important for mutual aid considerations and implementation.

Pre-incident planning; Management of resources (physical, financial, etc.); Post-incident management

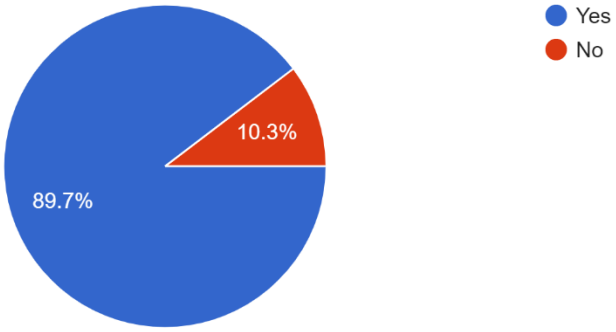
I would suggest a MCI topic would be ideal. Also any terrorism courses.

ICS, Safety Officer, Mass Casualty and some source of Airport Operations Human Resource Training.

MCI

10. Would a document such as this be welcome in your department and aid in your department's training plan?

29 responses



11. What barriers would exist in the implementation of such a document for your department's training plan?

29 responses

Funding
None
Culture Change, senior officers trying to do the same old way.
Labor agreements/Unit work
I don't see any barriers...Other that upper management within the FD NOT adhering to it on a consistent. (In other words, don't initiate the implementation, then stick it on the shelf for the next 5 years...
We have a training plan already
We are a relatively small department and do not have but one move from a firefighter role to an officer role. The current state requirements (guide) that we abide by works today. An ARFF command and control requirement would be welcomed.
Money. Union
Mutual aid officers may not want to participate in the extra training.
Union requirements and cost of sending personnel to additional training.
Funding for equipment, training, PPE if federally mandated.
The ability to provide consistent and effective initial and recurrent training to all personnel who are ARFF qualified.
The change process and what has been done in the past will continue to work for the future.
Cost and time
Cost of course, availability and ability to adapt it to specific departments needs.
Time constraints
Training schedule, budget, Developing curriculum, less control of our own training and curriculum
none

Delivery of the training county wide. If it were only being delivered to our ARFF station then it wouldn't be an issue but it would be a large undertaking if it was to be delivered to all of our 49 stations
increased oversight, creation of training program
Time, Money, Resources
Employee engagement.
If it is coming from the FAA, there will be no barriers. If it were to come as an NFPA recommendation, the local and some higher level officers may be a barrier.
Old timer's syndrome. If it ain't broken why put effort into it
Just the hurdle of change that comes with everything. If there was a cost that would have to be addressed as well.
Attempting to merge this into our current training program with all of the other all-hazards related training we do.
Taking the time to create the document

12. Airport/Index

29 responses

C
E
D
Index C
C-Index
Ted Stevens Anchorage International Airport, Anchorage, Alaska / Index E
Index D
c
Allegheny County Airport Authority (PIT - Index D and AGC - Not certificated)
MCI is a C, MKC is an A
FAI - Index C
E & C

13. Number of Officers & List of Ranks

29 responses

4
7
89
7
45
3
8
5
58
BDC

1- Division Chief on a 40hr workweek, 3- Company Officers one per shift, 9- Engineers three per shift; working 24hr on 48hr off schedule.
25 captains, 4 B/C's 1 division chief
1 Fire Chief, 3 Deputy Chiefs, 3 Captains and 3 Lieutenants
Per shift: Battalion Chief-1, Captain-1, Lieutenant-2, D/E-4, FF/PM-15, 40-hour: District Chief-1, Training Officer-1
2 Staff Training Captains 12 - Response Captains (4 per shift) 21- Roving ARFF captains (May be moved over to an ARFF position) 1 Deputy Chief 3 - Response Battalion Chiefs assigned to ARFF 10 - ARFF trained Chief Officers that may cover shifts for ARFF BC
Fire Chief and 3 Lieutenants
1 Acting Chief, 1 Deputy Chief, 6 Lieutenants
4, One Chief and three Deputy Chiefs
1 ARFF Captain (Specialty Captain) and 1 Operational Captain (ARFF qualified/certified and steps up to ARFF Captain when necessary) assigned per shift. We have 3 shifts working 24 on and 48 off
4 Captain, 1 B.C. @ MCI, 12 Captains, 3 BC @ MKC
4 Assistant Chiefs/3 Captains
3 Lieutenants, 4 Battalion Chiefs, 1 Fire Chief
26 sworn Police & Fire Officers - Officer - Sgt - Lt. - Deputy Chief - Chief
12 captains
3 officers Captain level
13 - Chief, AC, 4 BC's, 4 Capts, 3 LT's
48--- 1 FC; 2 AFC; 3 DFC; 9 BFC; 6 HQ Captains; 27 Ops Captains
43 captains, 6 BCs, 4 DCs and 1 Fire Chief

14. Number of Personnel

29 responses

16
44
23
18
92
22
130
15
57
20
71
For ARFF, 5 assigned (1 vacant spot), 62 current-not assigned, 89 not current-not assigned
12 on airport. 29 people off airport
93
22 total 21 working shift and 1 8-5.
52 positions

53 permanent ARFF positions (17 per shift plus staff) approximately 75 ARFF Rovers (can be moved over to cover ARFF positions)
14
9 assigned per shift- 1 ARFF Captain, 1 Operational Captain, and 7 Firefighters/Paramedics. We have a minimum level of staffing per day of 6- 1 ARFF Captain and/or Operational Captain and 4-5 FF/PM's. We staff 1 Command vehicle, 2 Crash Trucks, 1 Rescue Pumper with 2 FF/PMs, and 1 mini-pumper per day
26 @ MCI, 55 @ MKC
26
79 total ARFF personnel
6 per shift, 5 FF's and one Captain
43
163
198