Making Rapid Tactical Decisions Under Stress

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Certification Statement

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

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Abstract

Making rapid decisions under stress is critical to members of the fire service. The problem was that Loveland Fire Rescue officers displayed an inconsistent approach when making rapid tactical decisions under stress, thereby compromising the safety of firefighters and civilians. The purpose of this research was to determine what factors contributed to stressful decision making and what methods were available to improve the decision making process. This descriptive research project answered five questions, (1) what environmental factors were present when individuals made decisions under stress, (2) what was the impact of individual education, training, and experience, (3) what human factors inhibited or contributed to successful decision making under stress, (4) what decision models are taught and used by LFR and the fire service, and (5) what methods were employed by other professions to teach rapid decision making under stress? A descriptive research method was used and a survey was employed to gather data. The survey questions were (1) how did you teach your personnel to make rapid decisions and (2) what decision models did you use? The procedures used were a literature review and a two-question survey distributed to members of 13 fire and EMS agencies in 18 states. The results determined that recognition primed decision making was based on intuition gained through experience. Furthermore, human and environmental factors have impacted rapid decision making as well. The survey results reinforced the observation of inconsistent decision making with LFR officers. Recommendations included the implementation of the Observe, Orient, Decide, and Act (OODA) Loop, teaching the differences between naturalistic and traditional decision making, implementing the use of simulations, and closing the instructional gap between the structural and wildland firefighting communities.
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Making Rapid Tactical Decisions Under Stress

Introduction

Every day, officers and acting officers of the Loveland Fire Rescue Department (LFR) face the daunting task of making rapid tactical decisions under stress. As a result, these officers experience stress induced pressure related to environmental and human factors, varying experience levels, training issues, and a multitude of other reasons. The United States Marine Corps (USMC) describes this as “an atmosphere of uncertainty” (Warfighting, 1997, p. 7).

The ability to make correct, rapid decisions while operating in a high-stress environment is paramount to the safety of both firefighters and civilians. Officers must realize that decision making failures can produce dire consequences at the scene of emergencies thus impacting firefighter and civilian safety. Individuals tasked with the responsibility for public safety must also grasp the fact that postponement or hesitation in decision making is still considered a decision (Warfighting, 1997, p. 84).

The problem is Loveland Fire Rescue officers display an inconsistent approach when making rapid, tactical decisions under stress, thereby compromising the safety of firefighters and civilians. The purpose of this research is to determine what factors contribute to stressful decision making and what methods are available to improve the rapid tactical decision making process. This descriptive research project seeks to answer five questions:

1. What environmental factors are present when individuals make rapid tactical decisions under stress?

2. What is the impact of individual education, training, and experience upon rapid tactical decision making?
3. What human factors inhibit or contribute to successful rapid decision making under stress?

4. What decision making models are Loveland Fire Rescue and the fire service teaching and using?

5. What methods are employed by other professions to teach rapid decision making under stress?

This research will benefit Loveland Fire Rescue by providing a greater understanding of situational awareness, developing a deeper comprehension of the decision making process, and exposing members of LFR to several decision making models. Another benefit of the research is the development of individual mental processes and enhanced “speed of execution” (Gray & Otte, 2006, p. 64) relative to decision making. Should LFR accept and apply the outcome of this research project to daily operations, the results will be reflected through improved firefighter safety and enhanced citizen service.

Background and Significance

The Loveland Fire Rescue Department provides fire, EMS, and special operations (hazardous materials, dive rescue, collapse/confined space/trench rescue, and rope rescue) services to the citizens of both the City of Loveland and the Loveland Rural Fire Protection District. A contractual relationship has existed between both governmental entities since 1947. Consequently, LFR provides services to approximately 85,000 people residing in 265 square miles of southeastern Larimer County. Within the jurisdictional boundaries there is an interstate highway, two U.S. highways, a major rail line, and a small airport that provides commercial jet service to other cities. Additionally, the Department is tasked with protecting a diverse topographical region transitioning from rolling, high plains to rugged, mountainous terrain.
Within the 265 square mile jurisdiction, there is a mix of residential, commercial, suburban, and rural properties including wildland/urban interface locations.

Loveland Fire Rescue is a combination department staffed with 58 career personnel and 17 volunteer firefighters in the Suppression Division. The Community Services Division and LFR Administration employ an additional seven individuals. The Department operates five fire stations with three engine companies, one squad company (engine operating as a truck company), and one truck company that cross-staffs a rescue truck. Included in the Department’s fleet are various support vehicles such as brush patrols, water tenders, special operations apparatus, and aircraft rescue firefighting equipment.

The officers and acting officers of Loveland Fire Rescue bear the responsibility of making rapid decisions on every incident. Many times these obligations occur during conditions of incredible psychological and physiological stress. The choices made by officers impact the outcome of an incident whether it is a fire, medical emergency, or rescue. Therefore, it is very important for officers to realize that the process involved in making weighty and urgent decisions under stress differs greatly from ordinary, day-to-day business decisions. If there is a failure to recognize the difference between the two processes, then difficulties can arise as individuals attempt to apply traditional decision making methods to a rapidly changing and dynamic environment (Snowden & Boone, 2007).

Problems associated with rapid tactical decision making at LFR were first recognized in September 2007 at a training scenario involving the use of live fire. During that same period of time, LFR policies stated that formal command would not be established until the arrival of the third-due company or the battalion chief. However, it was implied, but not declared, that some type of command structure would be established on the arrival of the first-due unit at multi-
company incidents. In order to evaluate the actions of the officers, the drill participants were told that the arrival of the battalion chief would be delayed due to an extended response. The intent behind this caveat was to determine what decisions would be made and how they would be implemented in the absence of a chief officer.

At this particular drill, the first-due engine company was staffed with an acting officer for the duration of the shift. Upon his arrival at the scenario, he provided a thorough and accurate size-up of the situation confronting him. Nevertheless, he failed to take immediate action to mitigate the incident. This resulted in a very obvious and recognizable breakdown of his decision making process. The arrival of the second and third-due companies only exacerbated the situation as they too failed to take action to correct or stop the problem. While the fire continued to burn, all three officers met in order to discuss what actions should be taken to extinguish the fire at the relief valve of a 1,000 pound propane simulator. The impromptu meeting continued for several minutes until the evaluator intervened, pausing the scenario with the intent to bring order to the exercise. The fire was subsequently extinguished, but with a considerable amount of consternation and angst from the participants.

During the ensuing critique it was determined that due to policy interpretation, the first two officers believed it was not their responsibility or obligation to establish command or issue orders to incoming units. Both individuals believed the third-due officer would establish command and make the necessary decisions to bring the simulation to a successful conclusion. However, the third-due officer admitted that he became intently focused on the fire and it never occurred to him to establish command or to make a decision. Consequently, there was a conspicuous absence of command presence and a complete disintegration of leadership, situational awareness, and decision making.
Following this episode the author made a concerted effort to closely observe the decision making process of officers during drills and emergencies. It became apparent that other individuals in LFR experienced the same trouble as the officers involved in the September 2007 drill. Although, it is important to note that several officers did not display problems or issues when making rapid tactical decisions. Through observation and questioning it was clear that a problem existed relative to the department’s rapid tactical decision making.

When presented with the inherent risks of firefighting and rescue work, it is very important to implement quick, decisive action at emergency scenes. The significance of this research is connected to improved firefighter and civilian safety and enhanced citizen service. The third idea described in the Firefighter Life Safety Initiative’s states, “Focus greater attention on the integration of risk management with incident management at all levels, including strategic, tactical, and planning responsibilities” (National Fallen Firefighters Foundation, 2004, p. 1). Following suit is the third operational objective of the United States Fire Administration and “the call to reduce line-of-duty deaths among firefighters by 25 percent” (United States Fire Administration, n.d., p. 4). Another area of significance is the link with the United States Fire Administration’s Objective 3.1, “Improve the Nation’s incident decision making skills” (United States Fire Administration, 2009, p. 8).

In conclusion, the research paper is related to the first year of the Executive Fire Officer Program because of the association between decision making and leadership, change management, and organizational culture.
Literature Review

The literature review conducted for this research project identified numerous and important aspects of rapid tactical decision making. To begin with, the ability to make rapid decisions under stress becomes problematic when individuals attempt to apply traditional decision making models used in the business world to a dynamic and rapidly changing situation. The research performed by Snowden and Boone (2007) recognized that when circumstances change and become more complex, it is necessary to apply different methods of decision making to the situation. As a result, they developed the “Cynefin framework…pronounced ku-nev-in…a Welsh word that signifies multiple factors in our environment and our experience that influence us in ways we never understand” (p. 70). Snowden and Boone created four contexts: complex, complicated, simple, and chaotic. They stated that leaders must identify what context they are operating in and then adjust their behavior to match the appropriate one. One word that consistently appeared across all four contexts was “sense” which requires the decision maker to “assess the facts of the situation” which leads to basing “their response on established practice” (Snowden & Boone, 2007, p. 70).

The necessity for rapid decision making has existed for centuries in numerous professions including the military, aviation, nautical professions, and emergency services. Many times the ability to make these decisions is based on what individuals have described as feelings (Weick & Sutcliffe, 2007). This knack or skill has also been referred to as intuition (Klein, 2003).

Although not expressly identified as intuitive decision making, inferences to that particular skill have been made by numerous military authors. Zhang Yu, an ancient Chinese warrior stated, “What the aware individual knows is what has not yet taken shape, what has not yet occurred” (Sun Tzu, 2005, p. 60). This theme was echoed by von Clausewitz in the 1800s
when he said that “in momentary emergencies the man is swayed more by his feelings than his thoughts” (Von Clausewitz, 2004, p. 40). A similar pattern of thought was repeated during World War I by Captain Adolf Von Schell of the German Imperial Army when he indicated that a “decision had to be felt rather than arrived at through logical thinking” (Von Schell, 1933, p. 53). At the conclusion of World War II, the U.S. Army commissioned a study to determine the effects of combat on soldiers. Referring to a person’s ability to make sound judgment calls, Marshall (1947) recounted that knowledge and experience was an important factor affecting thinking and individual reactions of soldiers. Moving forward to the Vietnam War, Colonel Myron Harrington referred to the absolute necessity and ability of Marines to “quickly assimilate” the surrounding environment (McKeldin, 1999, p. 161). Finally, based on experiences in Operation Iraqi Freedom, Colonel McCoy references the art of command and the commander’s ability to utilize intuition (McCoy, 2006).

Research performed by Klein on intuitive decision making confirmed that it was a skill used by not only the military, but firefighters as well. His definition of intuition was “the way we translate our experience into action” (Klein, 2003, p. xiv). In turn, Klein described this method as Recognition Primed Decision Making (RPD) and it was based on the situation, cues, and matching patterns supported by an individual’s experience and judgment.

Klein’s research distinguished two important elements of RPD: mental simulation and mental models. Mental simulation is a process of envisioning what may happen and how to address it. These two items were united with mental models or individual understanding of how and why things happen. Bonded to this concept is the importance of individual experience and how it influences a person’s RPD (Klein, 2003).
Klein also addressed the problems and barriers associated with RPD. A difficulty arises with RPD when a person does not have enough experience or they lack quality experience for an express situation. He described barriers to intuitive decision making such as organizational policies, procedures, change, and information technology (Klein, 2003). The deficiencies of RPD were further illustrated in an article written by Colonel Charles T. Rogers of the British Army. He acknowledged the risks associated with intuitive decision making and described it as more of an “art rather than a science” (Rogers, 1994, p. 40).

In 1990, the U.S. Navy initiated a seven-year research project studying decision making under stressful conditions. The Navy’s Tactical Decision Making Under Stress (TADMUS) project resulted from a July 1988 incident involving the USS Vincennes. During that incident, the Navy erroneously shot down an Iranian Airbus after it was mistaken as a hostile attack against their warship. Several factors affected this decision including the presence of an Iranian military aircraft in the vicinity, negligence on the part of the Airbus crew to follow established procedures, and failure on the part of the Airbus crew to acknowledge radio transmissions from the USS Vincennes. Adding to this tension was the “very limited time to make a decision” (Cannon-Bowers & Salas, 1998, p. 5); seven minutes to be precise.

The TADMUS researchers studied several decision making models including naturalistic decision making (NDM). They described NDM as “the study of real-world task performance and action in which decisions happen to be embedded” (Cannon-Bowers & Salas, 1998, p. 24). According to this study, an individual’s ability to make decisions should improve over time as they gain more experience. Consequently, the researchers connected NDM with RPD. As with other works studied in the literature review, the TADMUS researchers not only discussed the
strengths of pattern recognition, but they also pointed to inadequacies created by “novel or ambiguous situations” (Cannon-Bowers & Salas, 1998, p. 157).

Recognition primed decision making, naturalistic decision making, and traditional decision making were referred to in several fire service textbooks (Her Majesty’s Fire Service Inspectorate, 1999; see also Angle, Gala, Harlow, Lombardo, & Muciuba, 2008; Murgallis & Phelps, 2004; Ward, 2008). However, the British fire service specifically identified three types of command and the decision making styles associated with each one. The first one was strategic command which incorporated the overall picture and the long-range approach to an incident. The decision making style associated with this type of command was “creative or analytical, since the situations encountered will feature a number of novel elements or developments the strategic commander has not previously encountered” (Her Majesty’s Fire Service Inspectorate, 1999, p. 60).

The second one was tactical command and was associated with shorter time frames than strategic command. The decision making style associated with this command “is based to a much greater extent on condition matching, or rule-based reasoning” (Her Majesty’s Fire Service Inspectorate, 1999, p. 60). In this model, situational awareness became a larger part of the process as the plan and circumstances changed (Her Majesty’s Fire Service Inspectorate). The third type was operational command which the British described as one that “involves front line or sector commanders who have to implement orders from the tactical level” (Her Majesty’s Fire Service Inspectorate, 1999, p. 60) and it employed RPD as the decision making model.

Within the wildland firefighting community, the National Wildfire Coordinating Group (NWCG) taught a decision making model that began with situational awareness. In this model the decision maker gathered information through observation and communication and matched it
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against their perceptions. The cycle integrated the situational awareness component and
proceeded through several steps that involved recognition, option selection, decision point,
action, and change (National Wildfire Coordinating Group, 2007).

In terms of environmental factors, the TADMUS researchers identified ten elements
described as physical and psychological components that impacted high-stress situations.
However, it should be noted that the U.S. Navy researchers did not separate human factors from
environmental factors. These ten items take in “multiple information sources; incomplete,
conflicting information; rapidly changing, evolving scenarios; time pressure; and adverse
physical conditions” (Cannon-Bowers & Salas, 1998, p.19).

In comparison, Gasaway’s (2009) research on barriers to situational awareness and
impacts to decision making, portrayed high-stress environments as ones that contained multiple
sources of information, physical/mental stress, communications issues, command post location,
distractions, and interruptions amongst others. Further related to environmental factors was the
research performed by SA Technologies, Inc. for the U.S. Army that resulted in the recognition
of three levels of situational awareness, including “the perception of the elements of a particular
environment” (Endsley & Strater, 2000, p.1).

Another important component was human factors, a term that encompasses a broad range
of explanations and definitions. According to the National Aeronautics and Space Administration
(NASA), the phrase included “human performance, technology design, and human-computer
interaction” (Human Factors Research and Technology, 2003). In one wildland firefighting text,
the author referred to these factors in terms of human performance, but coupled it with the word
“skills” (Teie, 2005, p. 50). Gasaway’s work listed eleven elements related to human factors that
included personalities, individual physical and mental attributes, and organizational culture (Gasaway, 2009).

Ted Putnam, a Human Factors Specialist with the U.S. Forest Service, addressed a multitude of human factors relative to firefighter fatalities and entrapments in the wildland arena. In one report, he emphasized the importance of “mental, cultural, and organizational processes” (United States Forest Service, 2008, p. 97) relative to this topic and their impact on individuals. In another document, Putnam (1995) identified human error as “a tragic common denominator” in wildland fire entrapments. Additionally, human factors were significant contributors to the deaths of five firefighters in August 2001 at the Thirtymile Fire in Washington State (United States Forest Service, 2001; see also Maclean, 2007).

Acknowledging the relevance of human factors, The National Wildfire Coordinating Group described five categories related to situational awareness in the Incident Response Pocket Guide. They were: experience, distractions, fatigue, stress, and attitudes (National Wildfire Coordinating Group, 2010). The NWCG sources consulted in this literature review demonstrated that situational awareness, human factors, and decision making were interrelated and could not be separated from one another (National Wildfire Coordinating Group, 2007).

During the 1970s, U.S. Air Force Colonel John Boyd conducted research related to rapid tactical decision making. Foundational to that study was a theory he developed earlier in his career called energy maneuverability (EM) which “is a method to determine the specific energy rate of an aircraft” (Coram, 2002, p. 146). Specifically, energy maneuverability was “a mathematically coherent theory in air combat: (Richards, 2003, p. 20). Boyd’s EM theory was widely adopted in both the U.S. military and the militaries of North Atlantic Treaty Organization
(NATO) countries. The original intent of the hypothesis was to provide a method for fighter pilots to gain a tactical advantage over enemy aircraft (Coram, 2002).

Boyd was not completely satisfied with the results of the EM theory and he began extensive research into the art of warfare. He was determined to find other methods that would provide a greater tactical advantage to U.S. and NATO fighter pilots engaged in combat. In particular, Boyd was fascinated with what he viewed as miraculous victories by numerically inferior forces. Most notable in his research were the tactics employed by the German Army during the Blitzkrieg of May 1940. In his research, Boyd discovered a consistent use of two German words: Fingerspitzengefühl and Schwerpunkt. The former meant an “Intuitive feel, especially for complex and chaotic situations” and the later meant “Any concept that provides focus and direction to the operation” (Richards, 2004, p. 51). Boyd theorized that by using Fingerspitzengefühl and Schwerpunkt, there would be an increased tempo brought to the process of decision making, thereby “increasing initiative, adaptability, and harmony within friendly forces” (Coram, 2002, p. 337).

An integral part of Boyd’s investigation was his insistence that thinking must be intuitive and implicit rather than explicit in nature, thereby allowing room for rapid decision making. He emphasized the development of the most important weapon: the human mind. Boyd’s work caught the attention of the U.S. Marines, especially General Al Gray the commanding officer of the 2nd Marine Division at Camp Lejuene, North Carolina. Boyd’s theory eventually became part of the U.S. Marine Corps maneuver warfare doctrine (Coram, 2002; see also Gray & Otte, 2006; Richards, 2004; and Warfighting, 1997).

The research conducted by Boyd resulted in his development of the OODA Loop as a decision making model. The OODA Loop (pronounced ooh-duh) incorporated four essential
elements: observe, orient, decide, and act (Coram, 2002). See Appendix A for an over simplified version of the OODA Loop and Appendix B for an illustration of the OODA Loop as intended by John Boyd (Richards, 2003, p. 22).

An individual’s ability to orient to a situation was the critical element in the OODA Loop. It involved “cultural traditions; analyses and synthesis; previous experience; new information;” and “heritage” (Richards, 2003, p. 22). According to Boyd, a person’s capacity to observe “is the only input from the outside” and consequently it determined how well their “orientation matches the real world” (Richards, 2004, p. 63). The observation of outside information was affected by “unfolding circumstances; unfolding interaction with the environment;” and “implicit guidance and control” (Richards, 2003, p. 22). The information obtained through observation and orientation was then used to complete the loop through decision and action. The cycle was continuously repeated with the intent to increase the tempo of the decision making process (Coram, 2002; see also Osinga, 2007; Richards, 2003; and Richards, 2004).

The literature review revealed that there were many interpretations of Boyd’s OODA Loop. In order to address these issues, Osinga’s research was performed with the intent to lend scientific credence to Boyd’s theory. Additionally, Osinga delved into the opinion that Boyd and the ancient Chinese warrior Sun Tzu were of the same caliber and train of thought. He stated, “if there is one strategic author Boyd must conceptually be related to, and compared with, it is Sun Tzu” (Osinga, 2007, p. 42).

The Prussian general Carl Von Clausewitz did not specifically refer to the terms human and environmental factors, but he addressed the concept of uncertainty and friction. His description of uncertainty was “like the effect of fog or moonshine – gives to things exaggerated
dimensions and an unnatural appearance” (Von Clausewitz, 2004, p. 85). As Clausewitz elaborated on the topic of uncertainty, he joined with it the human emotions of anxiety and exaggerated dangers. Clausewitz also described “a constant tendency to delay” and depicted it as “a retarding principle” (Von Clausewitz, 2004, p. 186). Suggesting a remedy to this problem, he said “We cannot imagine the full extent of this uncertainty and it is, therefore, important to prepare for it beforehand” (Von Clausewitz, p. 782).

In regards to friction, Clausewitz viewed it as an accumulation of difficulties and likened it to the operation of a large machine. He said, “the free will, the mind of the General, finds itself impeded in its action at every instant, and it requires a peculiar strength of mind and understanding to overcome this resistance” (Von Clausewitz, 2004, p. 782). The U.S. Marine Corps expanded upon the idea of friction and viewed it as mental, physical, external, and self-induced. They further stated that it “makes the simple difficult and the difficult seemingly impossible” (Warfighting, 1997, p. 5). The Marine Corps also addressed the notion of uncertainty and described it as “unknowns about the enemy, about the environment, and even about the friendly situation” (Warfighting, 1997, p.7). The USMC united risk and uncertainty and stated that it was “equally common to action and inaction” and “is the ungovernable element of chance” (Warfighting, 1997, p.8).

Weick and Sutcliffe referred to environmental and human factors in different terms in their work on High Reliability Organizations (HRO). Their approach to this issue was addressed through three principles of anticipation explained as a preoccupation with failure, a reluctance to simplify, and sensitivity to operations (Weick & Sutcliffe, 2007).

Relative to human factors, Gray and Otte identified the importance of mutual trust and respect as it pertained to judgment in decision making. They also illustrated the magnitude of
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decentralized decision making and its association with a term called commander’s intent or “the desired results of the action” (Gray & Otte, 2006, p.114). This was entwined in a command philosophy “based on human characteristics rather than on equipment or procedures” (Warfighting, 1997, p.78)

Sound judgment, mutual trust, respect, courage, and command presence were critical elements impacting decision making in a military environment. The importance of these qualities and other human factors were not only mentioned in modern works, but in writings of the World War II era as well (Sweeney, 2007; see also Faulkner, 2001; Marshall, 1947; Naval leadership with some hints to junior officers and others, 1939; West Coast Army Air Forces Training Center, 1942). The significance of these traits and their relationship to effective leadership were discussed in several fire service publications as well (Bruegman, 2009; see also Bruegman, 2005; National Wildfire Coordinating Group, 2007; Salka, 2004).

Considering education and the impact it has upon decision making, the Greeks used the word *paideia* to describe it as something that “encapsulates the development of a person from childhood to maturity” (Kolenda, 2001, p. 10). Whether or not education is a bonus or an obstruction to decision making depends on how the person was trained. Unfortunately, barriers to the development of effective decision making skills were reinforced in educational programs that emphasized the completion of assignments rather than the expansion of critical thinking skills (Gray & Otte, 2006).

This literature review included information relative to the research project suggesting that rapid tactical decision making was intimately linked to intuition, recognition primed decision making, and naturalistic decision making. Additionally, the literature review illustrated the
importance of sound judgment based on valid personal experience. The literature review also revealed a close link between rapid decision making in the military and the fire service.

Procedures

In accordance with the direction of the National Fire Academy’s Executive Fire Officer Program staff, this research paper was written following the guidelines established in the 5th edition of the American Psychological Association’s *Publication Manual* (Publication manual of the American Psychological Association, 2001). Additionally, the procedures used in this research project followed the guidelines established by the National Fire Academy (U.S. Fire Administration, 2008).

The research method used for this paper was descriptive. The objectives of the project were to answer the following questions:

1. What environmental factors are present when individuals make rapid, tactical decisions under stress?
2. What is the impact of individual education, training, and experience upon rapid, tactical decision making?
3. What human factors inhibit or contribute to successful rapid decision making under stress?
4. What decision making models are Loveland Fire Rescue and the fire service teaching and using?
5. What methods are employed by other professions to teach rapid, decision making under stress?

The two phases employed to obtain information for this research project were: (1) conduct a comprehensive literature review and (2) the distribution of a two-question survey to
fire and EMS personnel who are responsible for rapid decision making in their respective organizations. The settings chosen for the literature review included the Loveland Fire Rescue Department’s training library, the author’s personal library, and the Learning Resource Center at the National Fire Academy. Sources of documentation contained within this research paper included books, periodicals, journals, and electronic references. For the purposes of this research paper, sand table exercises were defined as simulations that used large tables and sand to shape terrain features.

A survey consisting of two questions was distributed to 100 individuals in the fire and EMS professions representing 13 municipal, county, state, and federal agencies in 18 states. The survey was disseminated to all officers in Loveland Fire Rescue, students of a National Wildfire Coordination Group (NWCG) L-381 *Incident Leadership* course, first-year students of the Executive Fire Officer Program, and professional contacts of the author. The survey was hand-delivered to the L-381 students and electronically distributed to the other respondents as a Word document. A copy of the survey is contained herein as Appendix C.

The first set of respondents included all officers within Loveland Fire Rescue that currently work in or have worked in the Suppression Division. The second set of respondents in the survey were company officers, front line supervisors, shift commanders, division commanders, fire chiefs, and members of Type I, II, and III incident management teams from agencies in 18 states. The individuals selected for the survey represented a broad range of experience and each one had varying on-scene responsibilities at emergencies. Each person in both groups was responsible for and tasked with making rapid tactical decisions.

The survey posed the following two questions:

1. How do you teach your personnel to make rapid decisions on-scene of emergencies?
2. Is there any particular decision making model that you use? If so, which one?

The questions were open-ended and the purpose and intent of the survey was to determine the following:

1. Did the respondents teach rapid tactical decision making to their subordinates?
2. What instructional methods were used by the respondents to teach decision making?
3. Was there an agency standard used and/or followed?
4. In the absence of an agency standard, were the respondents teaching rapid tactical decision making to subordinates based on an identified need in their respective jurisdictions?
5. If the respondents were using a particular decision making model, could they identify which one?
6. Were the respondents employing recognition primed decision making, traditional decision making, the OODA Loop, or another decision making model and they were not aware of it?

The survey was conducted at the end of the research project and 37 respondents replied.

The following paragraphs describe the limitations of this research project. The first limitation was related to time constraints. The amount of available resources and the ability to review all of them exceeded the time allotted to complete this project.

The second limitation was related to the two-question survey. The use of open-ended questions in the survey resulted in conclusions that were open to interpretation based on inferences and subjective answers. Instead of confining the survey to members of the fire and EMS professions, the survey should have been distributed to those in the law enforcement
community as well. Additionally, the sample size was small and may not be representative of the entire fire service population.

The third limitation was associated with a portion of the second research question. By attempting to determine the impact of education on rapid tactical decision making the question became too broad. Therefore, the literature review did not contain enough data to adequately answer that part of the question.

The fourth limitation became evident in the research question that asked: What methods are employed by other professions to teach rapid decision making under stress? By incorporating the use of the term “other professions” the field of research expanded to an unreasonable level.

Results

The findings of this project provided answers to all of the research questions. The first question asked: What environmental factors are present when individuals make rapid, tactical decisions under stress? The U.S. Navy’s TADMUS project identified ten elements that were present in the “operational environment” including “auditory overload/interference” and “adverse physical conditions” (Cannon-Bowers & Salas, 1998, p. 19). During the 2003 invasion of Iraq, McCoy described multiple environmental factors consisting of radio traffic, loud voices, vehicle movements, weapons firing, and explosions. He referred to this “as the phenomenon of auditory exclusion, or tunnel hearing, in which the brain, responding to stress and hormonally increased heart rate, filters out the unnecessary and processes the essential” (McCoy, 2006, p. 5).

Gasaway’s research identified multiple areas of environmental stressors including “changing conditions, incomplete or misunderstood communications, distractions, and interruptions” (Gasaway, 2009, p. 128). The various items listed in the answer to this question
were recognized by Endsley and Strater as Level One situational awareness which “involves the perception of the elements of a particular environment” (Endsley & Strater, 2000, p.1).

The survey asked questions relative to training methodology and decision making models. Therefore, the results were not applicable to the first research question.

The second research question asked: What is the impact of individual education, training, and experience upon rapid, tactical decision making? The literature review resulted in only two sources dealing with the topic of education and both reinforced the importance of it (Kolenda, 2001; see also Gray & Otte, 2006). However, Gray and Otte cautioned against educational programs that concentrated on assignments versus the development of critical thinking skills (Gray & Otte). Consequently the literature review did not provide adequate data to answer what impact education had on rapid tactical decision making.

Experience was intricately woven into intuitive decision making and it had a tremendous impact on how rapid decisions were made. Klein described it as “the way we translate our experiences into judgments and decisions” (Klein, 2003, p. 23). Therefore, experience was the breeding ground for expertise (Klein, 2003; see also Weick & Sutcliffe, 2007). Weick and Sutcliffe further defined expertise as “an assemblage of knowledge, experience, learning, and intuitions that is seldom embodied in a single individual” (Weick & Sutcliffe, p. 78). Klein stated that expertise helped a person “better appreciate cues, and to recognize patterns” (Klein, p. 104).

On the other hand, these same authors cautioned against an over-reliance on experience. Klein warned that it was easy to develop a mindset based on experience and not recognize a lack of it. This could cause a person to become “blinded” and “insensitive to unexpected or novel events” (Klein, 2003, p. 144). When a person did not have adequate experience, Weick and Sutcliffe advised that an ambivalent approach was the best course of action. They stated, “Begin
to contain the event by doing what experience tells you to do, but remain in doubt that you’re
doing exactly the right thing” (Weick & Sutcliffe, 2007, p. 158). Recognizing the weaknesses
associated with intuitive decision making, Rogers described it as “an art rather than a science”
(Rogers, 1994, p. 40). Following the same theme, the TADMUS researchers pointed out
limitations to intuitive decision making in “novel or ambiguous situations” (Cannon-Bowers &

The survey asked questions relative to training methodology and decision making
models. Therefore, the results were not applicable to the second research question.

The third research question asked: What human factors inhibit or contribute to successful
rapid decision making under stress? The term human factors assumed a broad definition
depending on which resource was used. Most authors agree that it was related to human
performance issues and situational awareness (Human Factors Research and Technology, 2003;
see also Endsley & Strater, 2000; and Teie, 2005)

The literature review determined that human factors and human error have contributed
significantly to workplace injuries/deaths and high profile mistakes over the years. In May 2000,
a 300 acre prescribed fire was planned within the confines of the Bandelier National Monument
in New Mexico. A series of human errors compounded by weather, fuels, and terrain resulted in
the fire escaping the containment lines. In the end, the fire consumed 18,000 acres, destroyed
235 homes, damaged other structures, and threatened the Los Alamos National Laboratory
(Weick & Sutcliffe, 2007).

A contributor to the tragedy at the Thirtymile Fire was “low situational awareness,
possibly exacerbated by sensory or perceptual factors” (United States Forest Service, 2001, p.
79). Human factors such as fatigue, inexperience, misunderstanding communications, personality
traits, and sociological factors also played a significant role in the accident (United States Forest Service). Maclean (2007) described the conflict that took place between the incident commander and the crew and squad bosses reporting to him. He stated, “This occupied the crew leadership and lowered the vigilance level as the fire approached and prevented any serious preparation from being accomplished at the site” (p. 176). In his paper on the 1994 Storm King Mountain Fire, Putnam identified human factors as “mental, cultural, and organizational processes” (U.S. Forest Service, 2008, p. 97). Other elements of human factors not mentioned in the previous paragraph included distractions, attitudes, stress, personalities, and individual physical and mental attributes (Gasaway, 2009; see also National Wildfire Coordinating Group, 2010).

It is interesting to note that the TADMUS researchers placed environmental and human factors into one grouping rather than separating the two (Cannon-Bowers & Salas, 1998). The Prussian general Carl Von Clausewitz did not specifically refer to human or environmental factors; however, he coined the terms uncertainty and friction as being key elements that affected decision making (Von Clausewitz, 2004). Uncertainty and friction were also addressed in U.S. Marine Corps doctrine and Boyd’s OODA Loop (Warfighting, 1997; see also Coram, 2002; Gray & Otte, 2006; Osinga, 2007; and Richards, 2003; 2004).

The importance of mutual trust and respect and sound judgment as it pertained to rapid decision making was illustrated numerous times throughout the research (Bruegman, 2005; see also Bruegman, 2009; Faulkner, 2001; Gray & Otte, 2006; Marshall, 1947; National Wildfire Coordinating Group, 2007; Naval leadership with some hints to junior officers and others, 1939; Salka, 2004; Sweeney, 2007; and West Coast Army Air Forces Training Center, 1942).

The survey asked questions relative to training methodology and decision making models. Therefore, the results were not applicable to the third research question.
The fourth question asked: What decision making models are Loveland Fire Rescue and the fire service teaching and using? The results of the literature review determined that no particular models were taught or used by the fire service as a whole. A review of ten, structural firefighting textbooks found four that discussed recognition primed decision making, naturalistic decision making, or traditional decision making (Angle, Gala, Harlow, Lombardo, & Muciuba, 2008; see also Her Majesty’s Fire Service Inspectorate, 1999; Murgallis & Phelps, 2004; and Ward, 2008). The literature review found no evidence indicating that any one method or model was being taught or used in the structural fire service. However, the wildland fire service taught a decision making model based on situational awareness that incorporated recognition, option selection, decision point, and action (National Wildfire Coordinating Group, 2007).

The survey consisted of 100 questionnaires distributed to members of fire and EMS organizations. Thirty seven surveys were returned representing a 37% return rate. Of the 37 respondents, one represented an EMS provider, ten represented wildland firefighting agencies, and 26 represented municipal fire departments responsible for structural response, wildland firefighting, aircraft rescue firefighting, special operations, EMS, etc. The individuals questioned were employed by 13 agencies at the municipal, county, state, and federal levels in 18 states.

The first survey question asked: How do you teach your personnel to make rapid decisions on-scene of emergencies? Specific to Loveland Fire Rescue, nine out of 26 officers returned the questionnaire. Of the nine individuals that responded, two people explicitly identified a system for teaching decision making whereas the remainder relied on various types of simulations, task oriented skills through repetition, or the use of mnemonics employed in structural firefighting for assessing the scene of an incident upon arrival and during the incident.
The two most commonly identified mnemonics were RECEO-VS (rescue, exposures, confine, extinguish, overhaul, ventilation, and salvage) and CAN (conditions, actions, and needs).

The other 18 respondents, representing municipal fire departments and the EMS agency, identified similar methods for teaching rapid decision making compared to members of Loveland Fire Rescue. However, two individuals stated they do not teach decision making to their personnel. Of the ten people representing wildland firefighting agencies, all identified a consistent technique for teaching rapid decision making to their subordinates. These methods included simulations, full scale exercises, and tactical decision making games. Consequently, the results of the first survey question corroborate the findings of the literature review by illustrating a disparity in teaching methods employed by municipal fire departments, EMS agencies, and wildland firefighting organizations.

The survey also asked the question: Is there any particular decision making model that you use, and if so, which one? Representing Loveland Fire Rescue, two out of nine respondents specifically identified recognition primed decision (RPD) making. One person alluded to RPD, but could not identify the term used to describe the model. Another individual identified a method for decision making that he learned in driver’s training class in high school referred to as IDPE (identify, predict, decide, and execute).

Of the remaining 18 people representing municipal fire departments and the EMS agency, three specifically identified recognition primed decision making as a model they used. One individual referred to a structural firefighting mnemonic called REVAS (rescue, evacuation, ventilation, attack, and salvage) and one person stated that he did not believe he possessed enough experience to answer the questions. The other 13 respondents indicated they did not use a decision making model.
Of the ten people working for wildland firefighting agencies, nine indicated that they used RPD or the wildland decision model (gather information, form a perception, recognize hazards, review/select an option, make a decision, take action, observe changes, and repeat the process). The tenth person stated that he did not use any particular decision making model.

As with the first survey question, the results of the second survey question also illustrated a disparity in decision making models between municipal fire departments, the EMS agency, and wildland firefighting organizations.

The fifth question asked: What methods are employed by other professions to teach rapid decision making under stress? The results of the literature review established that the U.S. military employees simulations and exercises to develop judgment and decision making skills.

One result of the U.S. Navy’s TADMUS project was the recognition that several trends existed relative to decision making. Amongst these were an increased reliance on technology, the need for specialized skills and knowledge, and “increasing recognition that real-world problems place extraordinary demands on decision makers” (Cannon-Bowers & Salas, 1998, p. 115). The researchers recognized that naturalistic decision making was a process and as such “training is predicated on teaching people to make the decision in the right way” (Cannon-Bowers & Salas, p. 117).

Four theoretical frameworks relative to team decision training were suggested as a result of the TADMUS project. The first framework took place in changing environments and built on a progression of dynamic experiences. The second framework was referred to as “levels issues” (Cannon-Bowers & Salas, 1998, p. 121) and involved the integration of both individual and team training. In the third framework, the leaders became the instructors and it was their job to take individuals and mold them into a cohesive team. The concept of life-long learning and
development was found in the fourth framework (Cannon-Bowers & Salas). As a consequence, simulation based training was employed by the U.S. Navy in an approach referred to as TEAMS/TANDEM which was the acronym for “team event-based adaptive multilevel simulation/tactical naval decision making” (Cannon-Bowers & Salas, 1998, p. 143).

Although Klein did not single out any one profession, he discussed the importance of coaching others in order to develop intuitive decision making. However, Klein acknowledged that teaching “your intuitions to others is a difficult skill” (Klein, 2003, p. 221). He suggested a model of coaching that would clarify goals, inject expertise, and foster ownership. Another teaching method recommended by Klein was the use of metrics which “are yardsticks measuring important characteristics of performance” (Klein, 2003, p. 239). Furthermore, Klein proposed the use of “PreMortem” exercises that were designed to find flaws, “key vulnerabilities,” and “weakness through mental simulation” (Klein, 2003, p. 98).

The U.S. Marine Corps placed a premium on training at both the individual and unit level. The Warfighting manual dictated that commanders must allow time for training and that it should be as decentralized as possible. The goal was to not only develop efficiency and proficiency in Marines, but also to expand initiative in subordinates in order for them to make necessary and correct decisions. One method used to accomplish this was through the use of drills and exercises. Drills develop “standardized techniques and procedures” whereas “exercises are designed to train units and individuals” (Warfighting, 1997, p. 60).

The results of the literature review and the survey indicated that recognition primed decision making and naturalistic decision making were familiar concepts to people with experience in the wildland firefighting arena.

Discussion
The ability to make rapid decisions under stress was of paramount importance to both the military and emergency services. In this type of setting time was a decisive feature that must be dealt with. Of equal importance “is realizing how much decision time is available and making the most of that time” (Warfighting, 1997, p. 85). As such, individuals and teams tasked with making decisions in a rapidly changing and dynamic environment were not afforded the luxury and comfort of a protracted or analytical process to arrive at a verdict.

This was the situation faced by the commander and crew of the USS Vincennes in July 1989 when presented with the very real possibility of a hostile and aggressive air attack by the Iranians. However, due to an unfortunate set of circumstances, problems with situational awareness, and misreading cues, a deadly decision was made resulting in the accidental downing of a civilian airliner that killed everyone on board the aircraft. As a result, the U.S. Navy commissioned the TADMUS research project or Tactical Decision Making Under Stress (Cannon-Bowers & Salas, 1998).

The TADMUS project addressed the issue of intuitive decision making and how it was intimately connected with experiences and pattern recognition. In their work, the researcher’s referenced Klein’s term of Recognition Primed Decision Making (RPD) and the link with intuition (Cannon-Bowers & Salas, 1998). Klein took great care to point out that intuition was not an esoteric or mystical concept. It was a learned and developed skill that came about “by building a richer experience base and making better use of it” (Klein, 2003, p. 8). Articulating on intuition, Klein stated it was “the way we translate our experience into action” (Klein, 2003, p. xiv). Therefore, experience served as the bedrock and key to successful decision making in a rapidly changing environment; provided an individual could make the appropriate applications from their experiences. Clausewitz fortified this statement by referring to “theorists, who have
never plunged in themselves, or who cannot deduce any generalities from their experience” as being “unpractical and even absurd” (Von Clausewitz, 2004, p. 63).

Once a foundation had been laid as part of a construction project, it would then become necessary to erect a structure on top of it. By comparison, in order to build a successful method for making rapid decisions, it was incumbent upon fire service leaders to develop critical thinking skills. This followed suit with the philosophy of the U.S. Marine Corps “to develop creative, thinking leaders” through “a continuous, progressive process of development” (Warfighting, 1997, p. 62-63). These statements could be linked to Klein’s reference to individuals who possessed experience “and are comfortable relying on that experience” (Klein, 2003, p. 282). To reinforce this point, a person’s comfort level was a skill that only came about through “experience, education, and intelligence” (Warfighting, p. 85).

The TADMUS researchers stressed the overall significance of “experiential learning” and the importance of “learning from supervisors and peers” (Cannon-Bowers & Salas, 1998, p. 249). An example of this was when jailed Palestinian leaders learned from each other in their cells while leaders of the Israeli military learned from one another while engaged in combat side-by-side. Richards described this as “an anvil of shared experience” (Richards, 2004, p. 54).

It is imperative to understand the significance of experience because it played a crucial role in the development of intuitive decision making skills. Experience was a part of the orientation phase of Boyd’s OODA (observe, orient, decide, and act) Loop along with information, culture, heritage, and analysis and synthesis (Richards, 2004). This grew and developed into the term the Germans described as Fingerspitzengefühl or “a fingertip feel” (Coram, 2002, p. 334). Boyd believed that the deeper meaning of this word applied “to a leader’s
instinctive and intuitive sense of what is going on or what is needed in a battle or, for that matter, in any conflict” (Coram, p. 334).

Another German word that was intertwined with Fingerspitzengefühl was Schwerpunkt or “the main focus of effort” (Coram, 2002, p. 334). Fingerspitzengefühl and Schwerpunkt were key building blocks of intuitive decision making. They were also central to the development and use of implicit guidance versus explicit guidance, in other words, commander’s intent. Commander’s intent allowed “subordinates to exercise judgment and initiative – to depart from the original plan when the unforeseen occurs – in a way that is consistent with higher commander’s aims” (Warfighting, 1997, p. 88). Klein described intent as “the outcome you want to reach…, the problem you are trying to avoid or solve, or the improvement you want to make” (Klein, 2003, p. 212). This allowed people to make intuitive decisions based on sound experience without fear of reprisal.

As a result this built mutual trust and respect amongst leaders and subordinates which was a vital element in decision making. In order for a person to make rapid decisions under stress, they must not only have experience and intuition, but they must also possess conviction in their ability to make the decision and belief in their superiors that the decision will not bring about retaliation or punishment. “Every effective bond between people has trust as its bedrock. Every failed relationship is ultimately an actual or perceived breach of that trust” (Kolenda, 2001, p. xix).

Trust must also exist between the person making the decision and those impacted by it. One author described trust as a person’s “willingness to be vulnerable to the actions of another person (leader, subordinate, or peer), based on a sense of confidence in the other person’s
competence to meet role requirements and character to behave cooperatively” (Sweeney, 2007, p. 252).

In the chaotic environment of either combat or an emergency, trusting in the leader’s ability to make rapid decisions under stress was paramount to a successful and safe conclusion of the event. Confusing and hectic environments are multi-faceted incorporating the weather, terrain features, varying fuel types, building design, heat and smoke, toxic vapors, loud noises and other components that lend themselves to physical and psychological discomfort for human beings. Putnam commented that “in situations that create stress, fear, and panic, minds regress toward simpler, more habitual thinking” (Putnam, 1995). Writing about the 1994 Storm King Mountain Fire that took the lives of 14 firefighters in Colorado, Putnam indicated that an increase in fire behavior brought about a corresponding increase in the stress levels of firefighters. Concurrently, there was a decrease in decision making and the organizational structure imploded (Putnam, 1995).

Gasaway’s research noted that dynamic, high-stress environments involved multiple sources of information, communications issues, and the elements of human factors that acted as barriers to situational awareness (Gasaway, 2009). A contributing cause to numerous firefighter injuries and deaths over the years had been the human factor. Unfortunately, many of these incidents involved multiple deaths such as the Storm King Mountain Fire and the Thirtymile Fire (Maclean, 2007; see also Putnam, 1995; United States Forest Service, 2001).

In the literature review, Endsley and Strater identified three levels of situational awareness. “Level one involves the perception of the elements of a particular environment” (Endsley & Strater, 2000, p.1). The second level of situational awareness was the comprehension
of the elements. The third level “requires the person to translate the perception and understanding of the environment” and make a forecast (Endsley & Strater, 2000, p.1).

The situational awareness component was related to the observation phase of Boyd’s OODA Loop. Richards (2004) stated that a person’s ability to match their orientation to “the real world is largely a function of how well you observe, since in Boyd’s conception, ‘observe’ is the only input from the outside” (p. 63). In another text, Richard’s reinforced the previous point by stating that “the only opening into the OODA loop is through Observation” (Richards, 2003, p. 23). He cautioned the reader that failure “to spot mismatches between what one believes to be going on and what really is, (i.e., between Orientation and the real world), one has become ‘mentally isolated’” (Richards, 2003, p. 23).

In Putnam’s study of the Storm King Mountain Fire, he said that “the human mind normally can handle only about seven factors” (Putnam, 1995, p.2). These aspects varied from person-to-person and individuals “are not always aware of which factors dominate their decision process” (Putnam, 1995, p.3). As a consequence, people “tend to be overconfident in their decisionmaking ability” (Putnam, 1995, p.3). The link between environmental factors, human factors, and situational awareness was best summarized in Gasaway’s statement that “data from the fire service, supported by findings in other settings when decisions are made under stress, affirm that SA plays an important role in decision making and safety” (Gasaway, 2009, p. 23).

The observation and orientation phases of the OODA Loop incorporated experience, intuition, environmental factors, human factors, and overall situational awareness. Boyd contended that by working on these elements, a person could increase the tempo, or speed of their OODA Loop thereby resulting in faster implementation of the Decision and Action phases of the Loop (Coram, 2002; see also Osinga, 2007; and Richards, 2003; 2004).
A model that was similar to the OODA Loop was the Decision-Making Cycle taught to wildland firefighters. It began with situational awareness or “how well perception matches reality” (National Wildfire Coordinating Group, 2007, p. 32). The cycle moved into recognition, option selection, decision point, and action. These elements bore a close and uncanny resemblance to the OODA Loop.

The literature review also highlighted the importance of developing intuitive decision making through scenario based training and decision making exercises. Addressing the specific needs of incident commanders, Gasaway pointed to the necessity of scenario based exercises, simulations, reviewing case studies and line of duty death (LODD) reports, conducting after action reviews (AAR), and using electronic media to enhance skills (Gasaway, 2009).

One of the questions posed in the survey asked: How do you teach your personnel to make rapid decisions on-scene of emergencies? Relating to Loveland Fire Rescue, two people identified a particular method that specifically addressed decision making skills. One individual taught situational awareness and critical decision making based on time, importance of the task, and available information. He based this on experience, self-study, discussion with others, visualization, and simulations.

The remaining LFR respondents indicated they rely on the use of simulations or task oriented skills development through repetition and drilling to teach decision making. Of particular interest was the use of mnemonics typically employed in structural firefighting for initial and on-going emergency scene evaluation. The two most commonly identified mnemonics were RECEO-VS (rescue, exposures, confine, extinguish, overhaul, ventilation, and salvage) and CAN (conditions, actions, and needs). Other respondents representing municipal fire
departments and the single EMS agency, identified similar methods for teaching rapid decision making.

The second question on the survey asked: Is there a particular decision making model that you use? If so, which one? Two LFR respondents specifically identified recognition primed decision making and a third identified a model used in driver’s training. Another officer stated that he was beginning to study the OODA Loop. One officer from LFR and two from other agencies specifically mentioned a method used in structural firefighting that uses size-up, conducting a 360 degree walk-around, value, time, size, identification of the problems, strategy, tactics, and benchmarks. The results of the survey indicated that confusion exists in regards to what rapid decision making was and how it should be taught.

The problem statement for this research project stated that Loveland Fire Rescue officers displayed an inconsistent approach when making rapid tactical decisions under stress, thereby compromising the safety of firefighters and civilians. The results of the survey offered evidence to substantiate the source of the problem. Inconsistency existed due to the fact that there was not a clear understanding of rapid decision making and what methods should be employed to teach it.

The respondents offered varying definitions of rapid decision making. A contradiction arose in one organization between four individuals regarding whether or not rapid decision making was even taught. Three people provided explicit details on teaching methods and identified the decision making models that were being used in that organization. The fourth stated that there was not a method or model being employed in his department. All four of these individuals currently serve or have served in key positions in that particular organization. This incongruity was fascinating, but it revealed an apparent problem related to human factors. The
question that comes from this scenario is why was one key member of the command staff isolated from what was taking place in his organization?

Another area of significance revolved around two individuals who stated they do not teach decision making to their personnel. One of them felt that he was not even qualified to answer the survey question. These two people and the one in the previous paragraph should present a warning flag to their respective organizations due to the fact that there is a perceptible lack of both self-awareness and situational awareness.

In contrast, the group representing wildland firefighting agencies consistently identified both the decision making models and the approach used for teaching rapid decision making to their subordinates. They referred to recognition primed decision making and naturalistic decision making. The methods used for teaching included sand table exercises (simulations), full scale exercises, and tactical decision making games.

It was interesting to note the differences in teaching methods between the structural and wildland arenas relating to rapid decision making. This raised the question, why? It also opened an opportunity for further research into this area to determine the reasons for the gap between the two disciplines of firefighting.

The implications to Loveland Fire Rescue were clear: it was necessary to identify a consistent approach and method for teaching rapid tactical decision making under stress. It would also become essential to identify and provide models for LFR personnel to use during the pursuance of their jobs. Otherwise, the inconsistencies may remain and there may not be a continuity of service, thereby increasing the likelihood for firefighter and civilian deaths and injuries.

Recommendations
The research set forth in this paper provided evidence and background information to substantiate the need for changes relative to teaching, implementing, and using rapid tactical decision making in Loveland Fire Rescue. Therefore, the following five recommendations were made:

1. Provide clear and consistent definitions for intuitive decision making, recognition prime decision making, and traditional decision making.

2. Provide thorough instruction on the OODA Loop and implement it as the decision making model for Loveland Fire Rescue. When presented with the fact that the OODA Loop was incorporated into U.S. Marine Corps maneuver warfare doctrine, it stands to reason that it would work in firefighting because both professions involve work in hostile and dynamic environments.

3. Clearly illustrate the differences between rapid decision making models and business decision making models. This would be accompanied with an explanation as to why business models would not work in tactical situations.

4. Develop and use consistent simulations, sand table exercises, table top exercises, and tactical decision making games to improve rapid tactical decision making skills.

5. A final recommendation is directed towards the entire fire service. Although the U.S. Fire Administration and the National Wildfire Coordinating Group (NWCG) has developed a method to close the gaps between the structural and wildland firefighting communities, it must be uniformly applied throughout the nation. The NWCG has developed, sanctioned, and provided instruction on leadership and decision making skills. However, in order for individuals to attend these classes, they are often required to possess qualifications such as engine boss, strike team leader, group
supervisor, division supervisor, etc. Throughout America, there are many firefighters and officers that do not possess these qualifications in an officially sanctioned capacity through the incident qualification system (IQS), yet they are certified to function in leadership positions through state agencies. These individuals are responsible for responding to any emergency that may arise in their communities up to and including wildland fires.

However, these individuals may be prevented from attending classes that would increase their knowledge and improve leadership and decision making skills because they do not have the required NWCG qualifications and prerequisites for class attendance. Some agencies may recognize the Skills Crosswalk Wildland Training for Structural Firefighters (United States Department of Homeland Security, Federal Emergency Management Agency and National Wildfire Coordinating Group), but that is not guaranteed. Although it is a separate subject for debate and research, the skills crosswalk lends itself to abuse and corruption if not properly managed and monitored.

This presents a moral and ethical dilemma. Training and education should not be withheld from people who need it to perform their jobs, whether they are career or volunteer firefighters, or municipal or wildland firefighters. To deny leadership and decision making training to people because they lack NWCG qualifications is to endorse haphazard and unsafe practices amongst our nation’s firefighters. The fire service would benefit from the discontinuation of this practice.
The endorsement, adoption, and implementation of these recommendations into the Loveland Fire Rescue Department may have a direct and positive impact towards firefighter safety, civilian safety, and improved service to the community.
References


Naval leadership with some hints to junior officers and others (4th ed.). (1939). Annapolis, MD: The United States Naval Institute.


Appendix A: Simplified Version of OODA Loop
Appendix B: The OODA Loop Sketch

The OODA “Loop” Sketch

- Note how orientation shapes observation, shapes decision, shapes action, and in turn is shaped by the feedback and other phenomena coming into our sensing or observing window.
- Also note how the entire "loop" (not just orientation) is an ongoing many-sided implicit cross-referencing process of projection, empathy, correlation, and rejection.

(Richards, 2004, p. 22)
Appendix C: Survey Questionnaire

Greetings,

I am completing a research paper for the NFA Executive Fire Officer Program and the topic is rapid, tactical decision making. As part of my research I am asking two questions:

1. How do you teach your personnel to make rapid decisions on-scene of emergencies?

2. Is there any particular decision making model that you use? If so, which one?

Name: ____________________________
Agency: ___________________________
Email/Phone: ______________________ (in case of a need to clarify answers)

This is strictly voluntary and if you decide to participate your names will not appear in my paper.

I realize that this is short notice, but if you decide to participate, I need your response no later than **Friday, 12 March at 1200 hours.**

If you have any questions please feel free to call my cell at 970-962-4762.

Thanks
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