

# INTERNATIONAL FIRE SERVICE JOURNAL OF LEADERSHIP AND MANAGEMENT



# Journal Team

---

## Editor

Dr. Robert E. England  
Political Science Department  
Oklahoma State University

## Associate Editor

Mike Wieder  
Fire Protection Publications  
Oklahoma State University

## Copy Editor

Lynne Murnane  
Fire Protection Publications  
Oklahoma State University

## Production Manager

Don Davis  
Fire Protection Publications  
Oklahoma State University

## Design & Layout

Ben Brock  
Fire Protection Publications  
Oklahoma State University

## Journal Webmaster

Desa Kinnamon  
Fire Protection Publications  
Oklahoma State University

## Subscriptions & Permissions

**Coordinator**  
Susan F. Walker  
Fire Protection Publications  
Oklahoma State University

# Editorial Board

---

Dr. David N. Ammons, Professor  
Political Science  
University of North Carolina at  
Chapel Hill

Gordon Aoyagi, Director  
Department of Homeland Security  
Montgomery County, Maryland

Ms. Meri-K Appy, President  
Home Safety Council  
Washington, D.C.

Dr. John Benoit, Professor  
Dalhousie University Nova Scotia,  
Canada

Brenda Berkman, Captain  
New York City Fire Department

Roxanne Bercik, Assistant Chief  
Los Angeles Fire Department

Dr. David Billeaux, Professor  
Political Science  
Texas A&M University at Corpus  
Christi

Dr. Anthony Brown, Professor  
Political Science  
Oklahoma State University

John M. Buckman III, Chief  
German (IN) Township Volunteer  
Fire Depart.

James A. Burns, Fire Administrator  
New York State  
Department of State Office of  
Fire Prevention and Control

Alan Brunacini, Chief (ret.)  
Phoenix Fire Department

Dr. N. Joseph Cayer, Professor  
Public Affairs  
Arizona State University

Steve Carter, City Manager  
City of Champaign, Illinois  
  
Bradd K. Clark, Fire Chief  
City of Owasso, Oklahoma

Dr. Kim E. Coffman, Professor  
Ottawa University, Phoenix,  
Arizona

Dr. Larry R. Collins, Chair  
Loss Prevention and Safety  
Department  
Eastern Kentucky University

Dennis Compton, Chief (ret.)  
International Fire Service Training  
Association  
Fire Protection Publications  
Oklahoma State University

I. David Daniels, Fire Chief  
Renton, Washington

Steven Edwards, Director  
Maryland Fire and Rescue Institute  
University of Maryland at College  
Park

Dr. Anne Eyre  
Trauma Training  
Leamington Spa, United Kingdom

Dr. Robert S. Fleming, Professor  
Management/MIS Department  
Rowan University

David R. Garcia, County Manager  
Yuma County, Arizona

Jason Gage, City Manager  
City of Salina, Kansas

Dr. Richard Gist, Principal Assistant  
to the Director,  
Kansas City, Missouri Fire  
Department  
Associate Professor of Psychology  
University of Missouri-Kansas City

Dr. John Granito, Professor and  
Vice President Emeritus  
State University of New York,  
Binghamton

Terry-Dawn Hewitt, Esq.  
Attorney-at-Law, Barrister & Solicitor  
McKenna-Hewitt, Denver, Colorado

Dr. Owen E. Hughes, Professor  
Graduate School of Business  
Monash University, Australia

Dr. Oliver Jones, Professor  
Political Science and Emergency  
Management  
Florida A&M University

Martha Clark Lofgren, City Manager  
City of Folsom, California

Dr. Susan MacManus, Professor  
Public Administration and Political  
Science  
University of South Florida

Mary Beth Michos, Chief  
Fire and Rescue, Prince William  
County, Virginia

Christopher Neal, Director  
Fire Protection Publications  
Oklahoma State University

William Peterson, Chief (ret.)  
Regional Director, Department of  
Homeland Security, FEMA Region  
VI

Dr. Richard L. Resurreccion,  
Consultant to Training Division, Long  
Beach Fire Department, Professor  
Emeritus, Occupational Studies  
California State University, Long  
Beach

Dr. William P. Robinson, Curriculum  
Coordinator  
Fire Protection Publications  
Oklahoma State University

Dr. Ray O. Shackelford, Professor  
School of Engineering, Computer  
Science Technology  
California State University, Los  
Angeles

Dr. Terry Shevels, Director  
Center Supporting Skills  
Development and Research  
The Fire Service College, United  
Kingdom

Ronald Jon Siarnicki, Executive  
Director  
National Fallen Firefighters  
Foundation  
Emmitsburg, Maryland

David L. Washington, Chief  
Las Vegas Fire and Rescue

William M. Webb, Executive Director  
Congressional Fire Services  
Institute  
Washington, D.C.

Dr. Edwin L. Wilson, Consultancy  
Services Manager  
The Fire Service College,  
United Kingdom

Dr. S. Joseph Woodall, Visiting  
Assistant Professor  
Fire Safety Engineering Technology  
University of North Carolina at  
Charlotte

Oklahoma State University in compliance with Title VI of the Civil Rights Act of 1964 and Title IX of the Educational Amendments of 1972 (Higher Education Act) does not discriminate on the basis of race, color, national origin or sex in any of its policies, practices or procedures. This provision includes but is not limited to admissions, employment, financial aid and education services.

Published in cooperation with Oklahoma State University, Fire Protection Publications, and the International Fire Service Training Association. *International Fire Service Journal of Leadership and Management*, Copyright © 2007 Board of Regents, Oklahoma State University. All Rights reserved. No part of this publication may be reproduced without prior written permission from the publisher.

*Messages from*

*Dr. Robert England* ..... 2

*Mike Wieder* ..... 3

*Chris Neal* ..... 4

*Dr. Denis Onieal* ..... 5

*Potential Research Topics* ..... 6

*Articles*

*Making Intuitive Decisions Under Stress: Understanding Fireground  
Incident Command Decision-Making*  
*Richard B. Gasaway* ..... 8

*Exploring the Efficacy of Computer-Based Training in a Workplace Setting*  
*Scott Somers* ..... 19

*Approaches to Leadership: The Application of Theory to the Development of  
a Fire Service-Specific Leadership Style*  
*Dr. Harry Carter* ..... 28

*Towards a Theoretical Model for the Evaluation of Equality and Diversity Initiatives*  
*William J. Scaife and Jacqueline P. M. Lilly* ..... 38

*Book Reviews* ..... 46

*Journal and Subscription Information* ..... 51

## *Message from Dr. Robert England*

---

Editor, *International Fire Service Journal of Leadership and Management* and Professor  
Department of Political Science, Oklahoma State  
University

On behalf of the entire journal team, welcome to this inaugural issue of the *International Fire Service Journal of Leadership and Management (IFSJLM)*. The creation of this journal is largely the result of the vision and leadership of three people. The first person is Chief (ret.) Chris Neal, Director, Fire Protection Publications (FPP) and Executive Director of the International Fire Service Training Association (IFSTA). Both organizations are located on the campus of Oklahoma State University. The second person is Dr. Denis Onieal, Superintendent, National Fire Academy. For many years, Dr. Onieal repeatedly called for the development of a peer-reviewed, academic journal in which articles related to fire leadership and management could be published and disseminated. Dr. Onieal argued, and rightly so, that the fire service could not become a profession without such a journal. The third person is Dr. Karl N. Reid, Dean, College of Engineering, Architecture & Technology. Dean Reid and Chief Neal were convinced that Dr. Onieal was correct; they went about the process of making this journal a reality. Since Fire Protection Publications is a non-profit organization (FPP) dedicated to the health and safety of members of the U.S. Fire Service, Dean Reid set aside funds for the development and production of what we have been told is the first academic journal in the U.S. that focuses exclusively on fire leadership and management. Once again, FPP, IFSTA, and Oklahoma State University assumed a pivotal role in the development of the national, and international, fire service.

It is my privilege and honor to serve as editor of *IFSJLM*. In this capacity my role is largely to manage the day-to-day affairs of the journal; I push the paper. I do not decide which articles are accepted; peer reviewers alone do that. After I receive an article I select two peer reviewers from among our extensive editorial board and/or list of "ad hoc" reviewers. These individuals are experts in the areas of fire science and public administration. The author's name is removed from the article and an external peer reviewer is given 30 days to read and offer comments on a paper. They have several options. They can accept the article "as is," accept the paper with specific revisions, ask the author to make significant revisions with no guarantee of acceptance if the changes are made, or reject the manuscript on the grounds that it does not advance the discipline of fire leadership and science enough to warrant publication. All reviews are double blind, with neither the author nor peer reviewer knowing the name of each other. For the most part, articles are

usually rejected outright or the author is asked to revise and resubmit the manuscript following the detailed instructions of the peer reviewers. A revise and resubmit requires another round of review by one or two peers, usually one previous evaluator and one new reviewer. For an article to make it through the peer review process is no small accomplishment. The authors of the three U.S.-based articles that follow as well as the authors who submitted articles for publication that were not accepted by the peer reviewers are to be commended and are deserving of your thanks. They are the ones who took a chance; they are the pioneers and role models. Some even found that despite their best effort, their article was not accepted. Fortunately, these innovators are of strong character. They did not take the article not being accepted as a personal affront. They know that this is the way the process works. Only the best of the best makes it to publication. After the journal is fully established, in fact, competition for space will be so intense that fewer than 15 to 20 percent of articles submitted for review will appear in *IFSJLM*. Unless otherwise noted, all articles that appear in the journal are peer-reviewed. Book reviews, however, are not peer reviewed. As editor, I review and accept or reject book reviews submitted to the journal. Also, please note that in each issue of the journal we include a section called "Global Connections." In this section, we reprint one article from a current issue of our sister journal published by The Fire Service College in Moreton-in-Marsh England and the Institution of Fire Engineers entitled, *Fire Safety, Technology, and Management (FST&M)*. In turn, one article from each issue of *IFSJLM* will appear in *FST&M*. Ms. Rosie Bennett serves as Managing Editor of this journal. Without the guidance of Ms. Bennett, *IFSJLM* would have never made it to print. Her help has been extraordinary. Thank you, Rosie.

Notice in the previous paragraph that I said the discipline of fire leadership and management. The goal of this journal is to "build theory that impacts practice." In doing so, we hope to advance the discipline of fire leadership and management. It is our sincere hope that you will submit your articles or book reviews to what will be called affectionately by those in the fire service as the "Red Journal," in honor of the red-covered training and educational books published by Fire Protection Publications these past 70 plus years. If YOU as practicing fire professionals and professors and students at colleges and universities fail to submit articles for review, the journal will fail. If YOU let this happen, shame on you. Dean Reid, Chris Neal and Denis Onieal provided you an opportunity to advance YOUR fire service. Now it is your turn to produce the high quality academic-based research that everyone knows members of the fire community are capable of producing. Your role models

in this issue of the journal have blazed a trail for you to follow. Now it is your turn!

Finally, for all of you who put this journal together, thanks. Prior to this issue, the journal was just an abstraction. You designed it and provided it with color and character. You chose the font and the layout. The presentation of articles and book reviews is a testament to the tremendous talent at Fire Protection Publications. Lynne Murnane served as copy editor of the journal. Her task was to bring consistency to a set of articles and book reviews that were not consistent in scope and structure. Her performance was stellar and should be much appreciated by you the reader. Ben Brock played a mayor role in the development of *IFSJLM*. Not only did he create the journal cover, he also was responsible for the layout and design of the entire journal. We are thankful for his creative genius, and that he shared it with us. Mike Wieder, Associate Editor, named the journal and supported all phases of the development of the journal. Don Davis served as production manager and with the help of his able assistant Ben Brock the journal was transformed from a stack of 8 ½ inch x 11

inch pieces of paper to a work of art. Susan F. Walker, who also serves as head librarian and archivist of one of the best fire libraries in the world located in the Fire Protection Publications Building on the campus of OSU, supported the development of the journal with the enthusiasm one would expect from an academic and librarian. As editor, I wanted these people and their labors on behalf of this journal to be recognized in this inaugural issue of the journal. In future issues their diligent efforts will only be reflected on the back of the front cover as a name associated with the journal team. But, we all know better than this; journal team members bring life to *IFSJLM* and the journal is a reflection of their personalities and professionalism.

So, once again, WELCOME to the *International Fire Service Journal of Leadership and Management*. A journal dedicated to the science and art of fire leadership and management. Join us as we Build Theory to Impact Practice.

Also join us on the web at [www.ifsjlm.org](http://www.ifsjlm.org).

## *Message from Mike Wieder*

---

Associate Editor, *International Fire Service Journal of Leadership and Management* and Assistant Director, Fire Protection Publications

Oklahoma State University has been meeting the needs of the fire service for training, education, and an increased level of professionalism for more than 70 years. When the firefighters in our state needed a better training program, OSU formed Oklahoma Fire Service Training in 1931. When a group of fire training directors from surrounding states identified the need for better-written training materials, OSU created Fire Protection Publications (FPP) in 1934 to support the International Fire Service Training Association (IFSTA) that was formed by these directors. The need for an academic degree program in the field of fire protection was addressed by the creation of the OSU School of Fire Protection Technology in 1937. That program was expanded to include occupational safety and industrial hygiene studies in the early 1970s during the emergence of Occupational Safety and Health Administration regulations. A need for an alternative system of accrediting fire service certificate and degree programs resulted in the creation of the International Fire Service Accreditation Congress (IFSAC) in the early 1990s. The fire service's demand for accessible and attainable graduate level degrees in fire service and emergency management resulted in the formation of the Fire and Emergency Management Program (FEMP) housed in the Political Science Department at Oklahoma State University.

It is my privilege to play a small role in OSU's next step in advancing the fire service to new levels of professionalism. The absence of a refereed, academic journal specific to issues of fire service leadership and management has been identified by many fire service leaders, such as National Fire Academy Superintendent Dr. Denis Onieal, as a glaring weakness in our goal to become a recognized profession. It is our hope and intent that the *International Fire Service Journal of Leadership and Management* will meet this need and provide a forum for progressive fire service leaders to test their theories and provide valuable information to their fellow brothers and sisters. I want to congratulate Fire Protection Publications Director Chris Neal and OSU Professor Bob England for their vision and hard work in establishing this journal.

Every time the fire service calls, OSU does its best to answer the call. This journal is another example of that dedication. However, it will only be successful if you, as a fire service leader, support the effort by using and sharing the information contained in this journal and by helping us find authors who will submit articles for consideration and publication. Together we can take the fire service to new levels. I hope you will help us in this quest.

## *Message from Chris Neal*

---

Director, Fire Protection Publications and Executive  
Director, International Fire Service Training  
Association

On behalf of Oklahoma State University Fire Protection Publications and the International Fire Service Training Association, congratulations to all who worked so diligently for this inaugural issue of the *International Fire Service Journal of Leadership and Management (IFSJLM)*, or “Red Journal.” Also, a special thanks goes out to Dr. Robert England, editor of *IFSJLM*, for his hard work and vision in bringing a dream to fruition.

It is not often that we get to observe watershed events in our service, and even then more often than not they are associated with tragic events. But then again, every so often good people, organizations, and events arise in their place. The result is a “raising of the bar” for our profession that serves as the foundation for future advancement. Thirty years ago, when many of the generation that is now leaving the fire service first came on board, there were no professional qualifications standards, limited occupational safety and health programs, very few specialized academic programs, and service delivery and related knowledge and skills were limited almost exclusively to suppression activities. Today, fire suppression is only one of a myriad of activities that we

perform. We are actively involved in Washington D.C. and state capitals around the country to secure better safety and funding. A strong academic background is a necessity for advancement in most departments. The time had come for a true professional, refereed journal, a journal that would take us to the next step in our profession.

Dr. Denis Onieal, one of the fire service’s preeminent and visionary leaders, has been vocal over the years in his attempt to advance the fire service to a true profession. He often noted in public venues that we would not cross that threshold until such a journal existed. Well, to Dr. Onieal, Dr. England, and so many other academics and practitioners in our service, thank you for your tenacity and vision, and congratulations on a job “well done.” Our challenge now is to honor your effort by supporting the journal through our readership, feedback, and submissions.

And finally to the “Red Journal” – welcome to the long line of successful fire service programs at Oklahoma State University. May your contributions be rich in substance, unmatched in excellence, and serve to further the safety of firefighters and the quality of service around the world.

## Message from Dr. Denis Onieal

Superintendent, National Fire Academy

*Excerpts of Speech Delivered by Dr. Denis Onieal  
July 8, 2004, in Oklahoma City Oklahoma, at IFSJLM  
Research Event 2004 (RS04)*

*Note From The Editor:*

*Each year prior to the beginning of the annual International Fire Service Training Association (IFSTA) Validation Conference, a one-day research event is held to support this journal. After the research event, paper presenters are invited to submit their research for peer review. Some of the articles have made their way through peer review into IFSJLM. At the inaugural research event in July 2004, Dr. Denis Onieal, Superintendent, National Fire Academy, delivered the keynote address. His address, in part, is reprinted below. That this journal exists at all is a testament to the vision and perseverance of Dr. Onieal. His clarion call for the creation of such a journal was finally answered. He is clearly one of the Guardians of whom he writes.*

### ***Who Shall Be The Guardians?***

The fire service long ago said good-bye to the twentieth century and marched into the twenty-first without ever asking ourselves one important question: "Who shall be the guardians of the fire service, the guardians of our society?"

When questions of the leadership and management of those guardians are posed, the answer as to who should be the guardians was answered long ago. They are the ones with knowledge, the ones who know the truth, and the ones who study. Perhaps Plato said it best over 2,400 years ago in Chapter 20 of the Republic:

There can be no question whether a guardian who is to keep watch over anything needs to be keen-sighted or blind. And is not blindness precisely the condition of men who are entirely cut off from knowledge of any reality, and have in their soul no clear pattern of perfect truth, which they might study in every detail and constantly refer to, as a painter looks at his model, before they proceed to embody notions of justice, honor, and goodness in earthly institutions or, in their character of Guardians, to preserve such institutions as already exist.

Well, then, who are our guardians? Who is to rule? What is our truth in America's fire service? Do we even know the truth? What passes for truth and knowledge in the fire service is imperfect. Our doctrine is experience and consensus based, not research based. Professional status demands that we develop and publish a body of knowledge founded upon rigorous academic

research and subject to scrupulous peer review and replication. Until or unless that happens, the fire service shall forever remain a vocation because we will never know the truth. There will be no truth, and we will never have guardians. In fact, we would not deserve them.

With the publication of the *International Fire Service Journal of Leadership and Management (IFSJLM)*, we have an opportunity and the forum to begin the search for the truth in the fire service. We cannot let it pass. It will take courage, effort, and vision.

The publication of *IFSJLM* makes us the guardians. We are in charge. No one can tell us what our truth is, and no one can stop us. By subscribing to, reading, and using this Journal you are a part of making that happen, beginning the search for truth. You are making history.

We cannot falter. We need strength now more than ever. We need your brains, your courage, and your vision. Researchers and practitioners like yourselves are the people who will show everyone how to turn a "no you cannot" into a "yes we can" for the future fire service. With this research, we can ignore the naysayers, laugh at the critics, and disregard the sincere incompetents who say it cannot be done. You are the people who saw all the previous false starts, and now realize that this time we are going to see it through.

This Journal over the next few years is about the future of the guardians.

The guardians have but one enemy, only one. It is the whining rhetorician who says that research cannot identify and solve our problems. The enemy to our progress is the failure in life who wants to rain on this parade; it is the know-it-all who has never accomplished anything in life who says they know better.

We shall no longer heed that voice, for now we have an alternative. We will not grant credence to that influence; we will learn better ways. We can no longer entertain the thought that there will be a better time or opportunity or place for this to happen. This is the opportunity, the time, and the place.

To participate in this effort by either writing for the journal or using research published in the journal as the basis for decisions is the opportunity of your professional life. You owe it to those who will follow us, to the next generation, to do so. When talking of opportunity, no one said it better than Brutus, in Shakespeare's play "Julius Caesar:"

There is a tide in the affairs of men,  
Which, taken at the flood, leads on to fortune;  
Omitted, all the voyages of their lives

Are bound in shallows and in miseries.  
On such a full sea are we now afloat;  
And we must take the current when it serves,  
Or lose our ventures.

And when talking about the courage that this will take, again, Shakespeare said it best in the play, "Henry V." King Henry spoke to his troops who were about to enter a decisive battle with the French. It was the battle of Agincourt. In part, he was encouraging his soldiers to take on what would be extremely arduous fight.

This day is called the feast of Crispian:  
He that outlives this day, and comes safe home,  
Will stand a tip-toe when the day is named,  
And rouse him at the name of Crispian.  
He that shall live this day, and see old age,  
Will yearly on the vigil feast his neighbors,  
And say 'To-morrow is Saint Crispian.'  
Then will he strip his sleeve and show his scars.  
And say 'These wounds I had on Crispin's day.'  
Old men forget: yet all shall be forgot,  
But he'll remember what feats he did that day:  
then shall our names be as familiar in his  
mouth as household words

This story shall the good man teach his son;  
And Crispian shall ne'er go by,  
From this day to the ending of the world,  
But we in it shall be remembered;

We few, we happy few, we band of brothers;  
For he today that sheds his blood with me  
Shall be my brother;

And gentlemen in England now a-bed  
Shall think themselves accursed that they were not  
here with us,  
And hold their manhoods cheap whiles any speaks  
That fought with us upon Saint Crispian's day.

The long fight to learn knowledge and truth will take courage, for the world of the fire service is filled with opinion and conjecture. To use the knowledge and share the truth is an even more burdensome task, for it requires you to help people change their opinions and their way of thinking.

Enjoy this Journal, enjoy this time and place; it is a new beginning for America's fire service. Commit your efforts to a foundation of research-based knowledge – it is your responsibility to provide it and use it.

Those efforts and acts of courage will be a joy to you in later years, perhaps only a fond memory, but certainly one strong piece of evidence of a life well lived and a reputation hard earned. It is what you deserve as a guardian.

## *Potential Research Topics*

---

### *Proposed Research Topics*

Are you looking for a topic for an Executive Fire Officer Program paper, a practicum, a master's thesis, or perhaps even a Ph.D. dissertation? At the inaugural research event that supports this journal held in 2004 (RS04), Dr. Denis Onieal and others at the symposium provided audience members some potential papers that need to be written. Check out the list below. Sometimes picking the topic is the hardest part of writing a paper.

#### *Paper topics suggested by Dr. Onieal:*

- Are successful service leaders and managers similar to or different from organizational leaders and managers in other public sector professions?
- Can the use of psychological assessment instruments validate fire executive leadership effectiveness?
- Do successful fire service leadership skills vary among career, combination, and volunteer fire departments? If so, how and why?
- What leadership roles are required for the modern fire chief? What are the chief's responsibilities to the community, the department, and the profession? What are the expectations on the chief from the community, the department, and the profession?
- What impact does fire department culture have on leadership, managerial, and supervisory styles? Are there multiple types of fire cultures? If so, what are they?
- What is the impact of higher education on leadership in the fire service?

- Is there a correlation between fire executives who have advanced academic achievement and their perceived leadership effectiveness?
- Is there a correlation between fire executives who have advanced academic achievement and the fire losses (human and physical) experienced in their communities?
- How does the fire chief remain a student? Where/ how/what are the most effective ways to continue the development of the chief fire executive?
- Are there empirical methods that can be used to examine the effectiveness of fire prevention and fire education activities? If so, can they be used in other fire and EMS areas?
- What is the influence of societal value shifts, generational shifts, and today's fire service workplace for career and volunteer members?
- Is there a relationship between city and community demographics and fire loss? Can one use demographic data to predict and/or identify fire problems? If so, how and with what effectiveness?
- Are there communications techniques and/ or processes used by other professions (e.g. commercial pilots/air traffic controllers, the military) that would have application in the fire service to improve communications, safety, or decision-making?

*Paper topics suggested by others at the conference:*

- What is the difference between the roles and functions served by leaders, managers, and supervisors in the modern fire service?
- Define "success" in fire service leadership.
- With over 30,000 fire departments in the U.S., we need a taxonomy or taxonomies of "types" of departments. We need a way to talk "broadly" about various types of fire departments.
- Who fill fund pure research for issues related to fire leadership and management?
- What methodologies can be used to examine fire leadership and management issues, problems, and concerns? How effective is the use of case studies, policy studies, systematic hypothesis testing, and meta-analyses as methodologies? Should studies be qualitative or quantitative, or both?
- What is the "ethics" of the fire service? Define it and analyze it.
- Fire leadership and management; is there an international skills set?
- Why hire as a fire chief a person who has risen up the fire leadership hierarchy instead of a private sector businessperson or a non-fire executive, such as a finance director, assistant city manager, or human resource director?
- What academic requirements are currently required for fire officers? What academic requirements should be required for fire officers and based on what criteria?
- Are the "reinventing government" and new public management movements impacting the modern fire service? If they are, how and with what level of impact?
- How is the issue of "diversity" affecting the modern fire service?

## Articles

**Richard B. Gasaway**, Ph.D. candidate, Capella University and Chief, Roseville, Minnesota Fire Department

### *Making Intuitive Decisions Under Stress: Understanding Fireground Incident Command Decision-Making*

#### *Abstract*

*This article evaluates the role of the intuitive decision-maker, including the influence of situation awareness, self-efficacy, tacit knowledge, mental modeling and recognition-primed decision-making on fireground command decision-making. The purpose of the paper is to improve the understanding of decision-making processes deployed during stressful fireground conditions. The research concludes with several recommendations, including the need to train both in the classroom and using practical modules, blending rational and intuitive decision-making processes; evaluating commanders using an instrument similar to the Myers-Briggs Type Indicator; and the need to evaluate catastrophic fireground incidents determining the decision-making style deployed and the role it played in the outcome. Further research is recommended to identify practical methods to develop the intuitive decision-making abilities of fireground commanders.*

#### *Toward a Better Understanding of Fireground Decision Making Processes*

Whether it is a house fire, a high-rise building fire, a plane crash, a hazardous materials spill or a mass casualty incident, fire incident commanders must make critical life and death decisions. The challenges faced by fireground incident commanders are complex, unpredictable, and stressful. The success or failure of saving lives and property depends upon firefighters being knowledgeable and experienced subject matter experts on fireground operations. In turn, the success or failure of the firefighters, working as a team to achieve this goal, depends upon the ability of the fire incident commander to make quality, effective, and timely strategic decisions.

Fireground incidents are fast paced, confusing, and ever-changing. The incident commander (IC) is often required to make numerous critical decisions under tremendous stress and time compression. The condition of the building, the damage the fire has caused, and the presence of contents that may be flammable or explosive are often unknown. In a matter of minutes, sometimes seconds, the IC will develop an incident strategy and deploy firefighters toward completing tactical objectives. This article analyzes how decisions are made during fireground command situations and draws similarities to military battleground decision-making. The ability of the fireground incident commander to make safe and appropriate command-level decisions depends on a combination of factors, including knowledge, experience, and training.

Since 1985, psychology researchers (Klein, Orasanu, Calderwood, and Zsombok, 1993) have conducted

fieldwork to learn how people make decisions during stressful, non-routine situations. Dr. Gary Klein and his associates spent almost two decades observing humans acting under stressful real-life decision-making situations. Time pressure, high stakes personal responsibility and quickly changing conditions encountered by decision makers were the focus of many of Klein's studies.

One of the professions chosen by Klein and his associates for study was fire fighting and, more specifically, the fireground incident commander (Klein, 1993; Klein, Calderwood, and Clinton-Cirocco, 1986). Klein set out to prove that IC's applied traditional decision-making processes that included identifying options, evaluating the choices, rating the choices and choosing the option that yielded the highest rating. Klein did his work in the field, riding along with firefighters and directly observing their decision-making processes and then evaluating these processes through a series of interview questions. Klein's evaluation of fireground incident commanders surprisingly revealed that decisions made by these individuals did not follow traditional processes. Instead, the incident commanders described their decisions as being intuitive, extrasensory perception, gut feelings, just knowing what to do, and other hard-to-describe subjective terms.

Other scientists like Dr. Dean Radin (see Koontz, 2001), conducted laboratory-based experiments to assess intuitive decision-making. Radin, then-director of the Consciousness Research Division of the Harry Reid Center for Environmental Studies at the University of Nevada-Las Vegas, attached electrodes to human subjects to monitor skin resistance; he applied the same methods used by lie-detector tests to measure

emotional changes. Radin had test subjects watch various images as they flashed up on a computer screen. Some of the images were intended to provoke forceful emotions, like a car crash or mutilated bodies. Others were calming images, like beautiful nature scenes. Radin's laboratory research revealed that one in ten study subjects showed a significant increase in arousal two seconds BEFORE the disturbing images appeared on the screen. Likewise, the subjects showed a drop in arousal BEFORE the calm images appeared. Radin's research showed that some subjects, even though they did not consciously know a gruesome scene was about to pop up, sensed it and responded subconsciously through their nervous system.

While Klein and Radin chose distinctly different methods by which to analyze intuition (e.g., field studies versus laboratory studies), their research and the research of others supports the notion that intuition is a vital component in decision-making, especially under stress. Decisions made under stress often do not follow traditional decision-making processes. Instead, fireground incident commanders rely on their well-developed sense of intuition. The way decisions are made under stress is an acquired skill that can be learned. And like any skill, it can be improved with practice (Klein and Weick 2000; Stewart 2002). There are numerous mental exercises and techniques to develop the right brain's intuitive processes.

According to McClean (1995), a program for improving intuition should have three basic components. First, for intuition to work, commanders must develop a full awareness of their cognitive selves to identify current intuitive abilities and the correct tools for subsequent development. Various test and exercise methods exist to identify individual intuitive abilities. For example, the Army's Leadership Assessment and Development Program (LADP) uses the Myers-Briggs Type Indicator test, which has proved reliable and valid for more than 50 years. Second, the commander must believe in intuition. Contemporary Western education focuses on left-brain skills and cognitive application. Right-brain creative skills, which include intuition, are neglected. An important first step is for individuals to acknowledge intuition's existence and potential. One must develop a clear reality perception, not a distorted ego view. This means undertaking exercises and open discussions about human behavior and thinking. Third, intuition must be cultivated and practiced.

In order to understand how rational decision-making impedes and how intuitive decision-making facilitates fireground incident command decisions, it is vital to first understand the rational decision-making process. According to Ford and Gioia (2000) reasoning ability, typically associated with complex problem solving, consists of gathering information, calling up relevant knowledge (explicit and implicit), making calculated observations about the situation, and processing alternative solutions. Rational decision-making employs a standard

technique for problem solving that involves a step-by-step process. Table 1 contains the six steps of the rational decision-making process identified by Pollock (2004, p. 15).

**Table 1**  
***Pollock's Six-Step Process to Rational Decision-Making***

1. Define the problem.
2. Assemble all the factors.
3. Break the larger factors down into their smaller parts.
4. Grade the factors according to importance.
5. Draw up a schedule.
6. Follow your plan.

Similar to Pollock's design, Table 2 contains a six-step process identified by Harrison and Pelletier (2000, p. 108).

**Table 2**  
***Harrison & Pelletier's Six-Step Process to Rational Decision-Making***

1. Set/reset objectives.
2. Search for alternatives.
3. Evaluate alternatives.
4. Make a choice.
5. Implement the choice.
6. Assess the choice.

Conventional decision science teaches us the importance of gathering facts to make rational decisions. It is theorized that the best decisions are made without emotions being involved because emotions impede good decision-making. The more objective and rigorous our thinking processes are, the better our decisions will be. In fact, until very recently, scholars and practitioners alike agreed that sound decision-making was understood to occur under only the most rational conditions (March, 1978; Simon, 1986; Sayegha, Anthony, & Perrewe, 2004; Damasio, 1994). Lazar (1999) argued that a rational decision-making method enabled the manager to process information clearly and logically, and thus allowed for accurate perception and interpretation of the event. These skills prevented the manager from excessively distorting reality, a possibility particularly under stressful conditions.

On the need to deploy a rational decision-making process, not all scholars and practitioners are in agreement. While Lazar argued the need to use rational decision processes under stressful conditions, researchers like Dr. Gary Klein disagreed. A number of decision researchers drew parallels between the decisions made on the fireground and the decisions made in combat. Rogers (1994) tells us that the demand for "certainty" on the battlefield leads to a demand for more information, much of which will be incorrect and misleading. On the battleground and on the fireground, the conditions

are always changing and there is seldom, if ever, information that can be deemed absolutely accurate.

March tells us there are some assumptions to the application of the rational decision-making model. Contrary to Lazar's belief that rational decision-making is beneficial during stressful decision-making scenarios, it could be argued that, if deemed accurate, March's (1994, p. 2) assumptions contained in Table 3 would impede the effectiveness of this model during fireground operations. These assumptions included:

**Table 3**  
**March's Rational Decision-Making Environment Assumptions**

1. The problem is clear and unambiguous.
2. The decision maker can identify all the relevant criteria and can list all the viable alternatives.
3. The criteria and alternatives can be ranked and weighted to reflect their importance.
4. The specific decision criteria are constant and the weights assigned to them are stable over time.
5. Full information about criteria and alternatives can be obtained because it is assumed there are no time constraints or cost constraints.
6. The alternative that yields the highest perceived value will be chosen.

From March's list of assumptions, we can see there could be a number of inherent dangers with using a rational decision-making process during emergency fireground operations. First, the problem is rarely clear and unambiguous. No two fire scenes are quite the same and in many instances it is not until the incident is complete that the IC is able to tour the emergency scene, interview firefighters and witnesses and piece together a semblance of what actually was happening during the incident.

The second flaw with the assumptions of rational decision-making applied to fireground decisions is the notion that the decision maker can identify all the relevant criteria and can list all the viable alternatives. This simply will not happen. As one experienced fireground commander points out (Gasaway, 2003):

If you wait until you have 100 percent of all the available information you need to make command decisions, you will probably burn the building to the ground. The fact is that the information is always changing. The fireground conditions are ever changing. The movement of personnel is also in a constant state of change. The integrity of the structure is continually being affected by the fire damage and the weight of the water being applied. (p. 16)

Equally as dangerous are the commanders who wait and wait for more and more information. If these commanders believe they do not have sufficient information to make a decision, they may delay their decision or reach a situation where they never make

a decision. The enemy of good decision-making can also be information overload, where more information is available than the IC can process and valuable time is lost as they ponder over a course of action. As time passes and more information comes in that contradicts the initial information, the IC may struggle with how to distinguish incorrect, unimportant, or misleading information. Another problem can be caused by excessive information. Sometimes, the more information commanders have at their disposal, the more reluctant they may become to make a critical decision. They either become overloaded or they delay making a decision on the belief that waiting will yield a vital piece of information that makes the decision easier. The risk is that piece of information never comes (Rogers, 1994). If an IC waits for the problem to stand still long enough to take a *Ready! Aim! Fire!* approach to decision making, they risk getting caught in analysis paralysis (Rogers, 1994; Gasaway, 2003). The conditions of an unstable, fast-moving incident rarely improve when the IC procrastinates on time-sensitive decisions. Efforts have been made in the fire service to introduce procedures and techniques to aid fireground incident commanders with using various rational decision-making processes. Incident command worksheets, computerized incident simulation software, mobile data computers with incident management software, and computerized hazardous materials response guides are a few examples. However, not all the technology designed to simplify the decision-making process for commanders has yielded success. For example, a fast-moving incident where information must be gathered and processed quickly may not be the place for an IC who lacks computer savvy, fumbling with computer-based incident management software. Likewise, not all incident commanders process information using the same logical processes. Thus, even low-tech paper-based systems may adversely influence an IC's decision-making processes if navigating through the system consumes valuable time or distracts the IC from the task of critical thinking and decision-making. The best system is one that the IC feels comfortable with. Worksheets can also include abbreviated lists to help the incident commander to remember to think big picture and to consider the unexpected.

While there has been some movement to automate decision-making systems, some research (Klein, 2003) has shown that:

Information technologies have a very strong tendency to reduce users to passive recipients of data, particularly users who are not intimately familiar with the way hardware and software is designed, which makes them reluctant to try to work around problems or strike out on their own. With the emergence of information technology we may be creating a new breed of decision makers who become mentally blind in that they will have lost their ability to look, to search. (p. 258)

Klein (2003, p.102) also cautioned that the best automated aids and checklists are not going to protect firefighters from freak accidents, so commanders still have to judge for themselves when the margin of safety has gotten too small. Checklists are not a substitute for intuition and experience.

In defense of rational decision-making processes, the evidence supporting the merits of rational decision-making models is abundant. In fact, most business schools encourage students to frame problems, formulate alternatives, collect data, and then evaluate the options. According to Stewart (2002) almost every organization that trains decision makers does so with a rational choice model.

If the rational decision-making process is such a proven commodity, then why would anyone listen to their gut or go with hunches when rational methods of problem solving are at their disposal? After all, we live in a society that is quick to criticize leaders who cannot back up their decisions with facts, especially if those decisions prove later to be flawed.

Not all decision scientists, however, believe that rational choice decision-making is best. But if we do not rely on rational decision-making processes, then what is our alternative? When tough decisions need to be made by subject matter experts on the fireground, the use of intuition is a viable alternative. Mintzberg (1976) emphasized that intuition was critical to successful visioning and strategy development. Mintzberg's findings were supported by Dreyfus (1997):

Researchers looking at actual cases of decision making found that in dealing with difficult, real-life situations in a domain in which they are already experts, the experts do not generate multiple courses of action, weigh the pros and cons of each, and then select the best line of action according to some evaluation function. Rather, the experts draw on their context-based intuitive understanding. There is a growing body of evidence that intuition is a vital component of leadership decision-making, especially when the leader is exposed to high-stress decisions under time constraints. (p. 27)

Intuition can produce decisions much quicker because it relies on our experience without having to analyze everything. Through experience, the decision maker begins to store images in the brain. A series of images form patterns. Klein and Weick (2000) tells us that when you spot patterns that make you worry, perhaps you cannot analyze what exactly triggered your concern, but you need to pay attention to it. Intuition means knowing something you have no logical way of knowing. It may help to think of it as the gut feeling you get when you instinctively know what to do in a certain situation, but you do not quite know why. Many corporations prefer words like "vision," "creativity," "innovation," and even "whole-brain training" when referring to intuition (Koontz, 2001). While there is growing support

for the use of intuition, some caution is advised. Rogers (1994) warned leaders not to reject their hunches, but to be prepared to discard them if they find no supporting evidence. This is a very important point for the fireground incident commanders and, as Rogers pointed out, it emphasizes the high-risk nature of intuitive decision-making and the need to have some check to ensure that the decisions made are safe. This safety check is either based on the experience, training and knowledge of the commander, or the use of outside advice against which the decision that is made can be checked.

### *The Value of Emotions and Experience*

There is disagreement among researchers on the role that emotions play in decision-making. Some researchers believe the best decisions are made without emotions being involved because emotions impede good decision-making. For example, Lazar (1999) cautions that excessive emotional arousal may cause superficial consideration of environmental evidence, leading to a distorted view of the situation.

Other researchers who support intuitive decision-making processes argue that in decision situations characterized by high stress, ambiguity, and time pressure (i.e., crisis), the commander will rely on intuitive processes and tacit knowledge, potentially aided by adaptive emotional responses (Sayegha, Anthony, and Perrewe, 2004). Stated another way, instead of relying totally on an unfolding linear sequence of steps, decision-making processes are also driven by the emotion, imagination, and memories of the decision maker.

Researchers who subscribe to intuitive decision-making theories refer to a process that includes tapping the memory of the decision maker for similar experiences that can be drawn upon. Not only do emotions not impede decision-making, the emotional memory of our decisions (e.g. pain, fear and anger) actually aids in our decision-making. Our emotional memory allows us to learn from our mistakes, even when we do not realize it in the current decision moment. The emotions experienced during an event have their own memory and this memory is triggered when similar circumstances arise (Sayegha, Anthony, and Perrewe, 2004; Watling, 1998).

Rather than proceeding merely as the unfolding of sequences of decomposed stages, decision-making processes are also driven by the emotion, imagination, and memories of the decision maker. A manager with experience may have a better awareness or a bigger repertoire of possible causes. A manager with past experience with events similar to the current crisis may have assumptions about the cause of the crisis through matching the current situation with his/her existing narrative schema, and thus might be able to make more effective decisions on these assumptions (Sayegha, Anthony, and Perrewe, 2004).

Researchers have observed that when faced with a similar situation, the decision maker may not recall the past situation, but will remember the emotion that

was elicited from the situation. According to Sayegha, Anthony, and Perrew (2004):

The emotional memory may guide the decider, by way of a gut feeling, to an optimal choice in situations that necessitate quick action. The decider's emotional memory, derived from experiential memory, is linked to an emotional response, which affects the relationship between tacit knowledge and the intuitive decision process. (p. 189)

Intuition may be defined as a pre-conscious (or subconscious) process of logical reasoning that has manifested its effects in conscious, systemic form. The subconscious intuitive mind can think logically and make decisions without registering any processes in the conscious mind, and with superior speed. If emotion caused by intuitive thought is strong enough, it manifests itself in the conscious mind. Intuition erupts into consciousness (McClellan, 1995).

There are other researchers who believe that intuition does not involve making spontaneous decisions at all, but instead results from a rapid sequence of thoughts that draw on already-existing knowledge. And if intuition relies on knowledge, it is logical that the best commanders will be those who are exposed to a wide variety of situations and able to build a bank of background knowledge (Rogers, 1994). Without experience, intuition cannot be fully engaged. McClellan notes that intuitive thinkers must be subject-matter experts (SMEs) and that the SME's vast subject knowledge ensures the basic building blocks (of decision-making and problem solving) are etched in the subconscious mind and do not require conscious thought to analyze (McClellan, 1995). The good news about this approach is that, as we gain experience, we can rely more on our gut feelings and experienced decision makers should not be afraid of listening to their gut. The bad news is that it can take years for individuals to acquire the education and experience to become SMEs.

Developing an ability to mentally game out an option requires an experience base to detect problems. As Klein and Weick (2000) aptly noted, to make good decisions under time pressure and uncertainty, you need to be experienced, and slogans and analytical tricks are no substitute. Experience lets a commander see patterns and typical cases, and it also spotlights anomalies that are warning signs. Skilled decision makers do not jump at the first thought that pops into their heads. They have been burned in the past, the painful part of acquiring experience.

According to Klein and Weick (2000, p. 19), experience gives decision makers certain advantages. Table 4 summarizes these advantages.

**Table 4**  
***The Advantage of Experience in Decision-Making***

1. Size up situations quickly;
2. Recognize typical ways of reacting to problems;

3. Mentally game out an option to see if it will work;
4. Focus on the most relevant data elements;
5. Form expectancies;
6. Detect anomalies and problems; and
7. Figure out plausible explanations for unusual events.

Experience is critical in the creation of tacit knowledge and use of intuitive decision-making skills. There is a growing body of literature documenting that senior managers routinely make decisions based on tacit knowledge grounded in experience (Agor, 1986, 1990; Giunipero, Dawley, and Anthony, 1999; Kleinmuntz, 1990). Five factors impact intuitive decision making: information, situation awareness, self-efficacy, tacit knowledge, and mental modeling.

### ***Factors Impacting Intuitive Decision-Making Information***

Intuitive decision researchers caution that one cannot wait for complete and accurate information to make critical decisions. This is especially true of the decisions made by military commanders and fireground incident commanders. So how much information is enough? As effective leaders, it is important for us to be able to process a limited amount of information, draw on our experience and intuition, make some reasonable assumptions, and then make a decision. Colin Powell recommends that, as effective leaders, we should gather between 40 and 70 percent of the information available, then rely on our gut and make the decision (Harari, 2002).

Overell (2001, p. 28) argued that the further up the management hierarchy people go, the more reliant they become on their intuition. He contends that eighty percent of senior managers use intuition to make decisions.

When uncertainty abounds, stakes are very high, and there is a very short time period in which to operate, decisions must be made within the context of multiple players, organizational and environmental constraints, and the knowledge that the potential consequences are difficult to fully evaluate (Huy, 1999; March, 1978; Weick, 1990). We gather a reasonable amount of data and rely on our experience and intuition to fill in the unknowns. The need to rely on intuitive processes becomes even more important during the uncertainty of rapidly changing conditions. In the Marines, the Corps' official doctrine reads, "The intuitive approach (is important) for the vast majority of decisions made in the fluid, rapidly changing conditions of war when time and uncertainty are critical factors, and creativity is a desirable trait" (Stewart, 2002).

### ***Situation Awareness***

A growing body of research indicates that under realistic conditions, experts make decisions using a holistic process involving situation recognition and pattern

matching to memory structures to make rapid decisions (Dreyfus, 1981; Klein, 1997; Klein, Calderwood, and Clinton-Cirocco, 1986). Within this framework, a person's situational awareness, and internal conceptualization of the current situation, becomes the driving factor in the decision-making process (Klein and Zsombok, 1997).

Similarities between fireground commanders and battleground commanders can be seen when noting the observations of the National Research Council (1997):

Situation awareness is a critical element of successful performance in the combat environment. The battlefield poses a variety of challenges to situation awareness: information overload, nonintegrated data, rapidly changing information, and a high degree of uncertainty brought on by the lack of needed information. (p. 43)

In Table 5, Endsley and Bolstad (1994, p. 244) identify five primary areas that relate to individual differences in situation awareness.

**Table 5**  
***Five Abilities That Influence Situational Awareness***

1. Spatial abilities: The degree to which one can mentally visualize and manipulate objects and also visualize one's own orientation relative to those objects;
2. Attention abilities: Specifically attention sharing as needed to achieve situation awareness in a complex environment;
3. Memory abilities: Including working memory capacity and the quality and quantity of long-term memory stores;
4. Perception abilities: Rapidly perceiving and assimilating new information; and,
5. Cognitive functions: Useful in helping to search out information and piece it together to form the higher levels of situation awareness.

There are limitations to situational awareness. The National Research Council (1997) tells us that situation awareness can be restricted by a person's attention span and the capacity of working memory, which constrains a person's ability to take in and process multiple channels of information. The presence of a new source of information that must be integrated with information in the environment can degrade situation awareness by imposing extra processing requirements. Due to the limited ability to perceive and process information, significant difficulties may be encountered unless stringent measures are taken to integrate multiple sources of information, reduce extraneous information, simplify the format of information presentation, and integrate the presentation of information (National Research Council, 1997).

A major challenge to maintaining good situation

awareness is the complexity of many of the systems that must be operated. The more complex the systems are to operate, the greater the increase in the mental workload required to achieve a given level of situation awareness. When that demand exceeds human capabilities, situation awareness will suffer (National Research Council, 1997).

Several types of environmental stressors may affect situation awareness, including physical stressors such as noise, vibration, heat or cold, lighting, atmospheric conditions, boredom or fatigue, and cyclical changes. Experienced fireground commanders who understand the need to remove themselves from physical stressors may run command from inside a vehicle at a location that is remote enough to the incident scene to prevent unwarranted distractions. Social and psychological stressors such as fear or anxiety, uncertainty, the importance or consequences of events, self-esteem, career advancement, mental load, and time pressure can also affect situation awareness (Lehto, Sharit, and Salvendy, 1991). These stressors can affect situation awareness in a number of different ways, including narrowing attention. In many cases, such as in emergency conditions, factors outside the person's perceived central task are the ones that can prove to be lethal (National Research Council, 1997). For example, when called into action at a stressful emergency scene, the IC does not have the luxury to set aside all of the social and psychological stressors that were present in his or her life before the emergency occurred. While emergency scenes require focus and keen situation awareness, the ability of the IC to function effectively may be influenced by pre-existing psychological and social pressures. When this happens, the IC can become distracted from the incident. Such a momentary lapse in awareness can be enough to allow information critical to the safety of operating personnel to slip by.

Premature closure, or arriving at a decision point without exploring all the information available, has also been found to be more likely under stress (Janis, 1982; Keinan, 1987; Friedland and Keinan, 1992). This includes both considering less information and attending more closely to negative information (Janis, 1982; Wright, 1974). The observation of Janis and Wright is salient to fireground command scenarios. During the early stages of a rapidly advancing emergency, ICs can find themselves being consumed by the need to give attention to the negative information being relayed. Action-oriented commanders are trained to be problem solvers. The arrival of negative information often indicates the presence of a new (or worsening) problem. Using a simplified example, an IC receives two consecutive reports from division officers, one stating they have achieved a knockdown on the fire on the second floor while the other reports a fire in the attic. Both reports are important for the IC's strategic considerations, but the negative news is likely to consume the larger share of the IC's thought processes and they contemplate how to solve this new problem. It is also likely that

while the IC contemplates how to address this negative information, additional information, both positive and negative will continue to arrive, requiring the IC to sort and prioritize this information for processing and action. Because we all have limitations to the volume of information we can process, especially under stress, the IC's attention may be drawn toward the negative information while some of the positive reports of progress are given less attention.

### *Self-Efficacy*

Self-efficacy, the sense of self-confidence or belief in oneself that the decision maker possesses, allows them to believe that they can handle the uniqueness of the current crisis. It is the belief that "I know I am doing the right thing" that enables the decider to trust hunches and to act on them. Past experience with similar situations helps build the decision maker's self-efficacy, sense of confidence, and level of comfort with acting on an intuitive decision (Agor, 1990). Self-efficacy is not concerned with the skills one possesses, but rather the judgment of what one can do with their skills.

Essentially, self-efficacy refers to a sense of mastery and control over one's environment (Sayegha, Anthony and Perrew, 2004). A strong sense of efficacy may foster an overall confidence and positive emotional response, resulting in a more effective decision-making process under crisis. This is a critical trait of effective battleground and fireground commanders. Without a high level of self-efficacy not only will the commander question (and possibly delay) critical decisions, but subordinates may also pick up cues of wavering confidence which can decrease their comfort with the command decisions being made. The fireground is no place for a commander who lacks the confidence to be effective. Most often, the incident is progressing at a pace that will not allow command to display uncertainty. The confidence and leadership displayed by commanders is often referred to as "command presence."

### *Tacit Knowledge*

Tacit knowledge is the knowledge accumulated through experience and memories, which are filtered through one's perspectives, beliefs, and values. The decision maker's experience and values interact with knowledge stores that are called upon implicitly and unspoken during a decision situation. Tacit knowledge in decision making is closely related to intuition. Brockman and Anthony (1998) proposed that the relationship might be viewed as a tacit knowledge inventory: a reservoir of implicit knowledge (gained through experience and memory) that may be accessed, or made explicit through intuitive thought processing. Demasio's (1994) research in the area of tacit knowledge revealed that the human brain compresses and stores a person's experiences and allows them to recall, almost instantly, numerous examples that may relate to the problem at hand. Their tacit knowledge provides a link between

the stored experiences in their minds and allows them to make estimates about what will happen even though the information being fed into the brain is incomplete.

The ability to use tacit knowledge to fill in the gaps in information and knowledge for accurate perception and interpretation of the crisis event is a skill indicative of those most likely to succeed and survive. One example might be the disastrous events at the World Trade Center on 11 September 2001 where 343 firefighters, including the entire senior command staff on the scene, perished. One could postulate that tacit knowledge of high-rise structural fire fighting possibly led them to consider the impending structural collapse. The depth of this topic is beyond the scope of this paper. Further research of the decision-making thought processes of surviving senior command personnel in the New York Fire Department would aid with validating or refuting the application of the tacit knowledge theory.

### *Mental Modeling*

The use of mental models in achieving situation awareness is considered to be dependent on the individual's ability to match critical cues in the environment and elements in the mental model. With experience, people develop internal models of the system they operate in and the environments they operate in. These mental models serve to help direct limited attention in efficient ways, providing a means of integrating information without loading working memory (National Research Council, 1997).

It is important in training to develop situations that allow individuals to make intuitive decisions, which means experimentation and tolerating mistakes. Experimentation with ideas should be encouraged and officers should not be penalized for honest mistakes (Rogers, 1994). Some of this learning can come from observing and imitating role models. In the fire service, post-incident evaluations or critiques can be a valuable tool whereby incident commanders can share their intuitive decision-making processes and allow others to learn from their experiences. Sharing such experiences can help develop the decision-making abilities of subordinate officers. Mental modeling, much like physical conditioning, must become part of a regimen to be effective. Table 6 identifies Klein and Weick's (2000, p. 21) five-step process commanders can use to become proficient more quickly in developing their mental modeling.

**Table 6**

#### ***Five-Step Process to Develop Mental Modeling***

1. Defining decision requirements.
2. Obtaining feedback about the decisions made.
3. Making up scenarios and using them. Constructing decision games and "what if" exercises. Finding actual case studies and learning from them, imagining what decisions needed to be made in that situation.
4. Observing, and appreciating, how uncertainty must

be managed, realizing that working under uncertainty is part of the management landscape.

5. Taking advantage of people who have expertise and tapping the expertise of others whose decisions may differ from your own inclination. Ask what their primary cues were and what distinctions they were making. This can get tedious if you overdo it, but real experts appreciate being studied.

The literature suggests that incident commanders often do not have time to follow the rational decision making model in highly stressful fireground incidents. Instead, based on the five factors that impact intuitive decision making outlined above, an alternative decision making model is offered.

### *The Recognition-Primed Decision-Making Model*

The recognition-primed decision-making (RPD) model was formulated in 1986 by Klein, Calderwood, and Clinton-Cirocco to explain how fireground commanders could use their experience to identify and carry out a course of action without having to generate analysis of options for purposes of comparison. Klein and his associates found that fireground commanders rarely compared the merits of alternative actions. Rather, they were able to use their experience to identify a workable course of action as the first one they considered. If they needed to evaluate a course of action, they would conduct a mental simulation (Klein and Zsombok, 1997).

The RPD model attempts to describe what people actually do under conditions of time pressure, ambiguous information, ill-defined goals, and changing conditions. RPD describes how people arrive at decisions without comparing the strengths and weaknesses of alternative courses of action and it describes the fundamental difference between the intuitive and the rational decision-making processes.

Research proved that under stress, people did not use rational-choice methods. The strategy they actually used was recognition-primed decision-making. Researchers argued it was faster than the analytical approaches because it relied on memory and recognition to get an immediate sense of what is happening. This theory contends that commanders do not have to deliberate about what to do because they have been in similar situations before. Klein, Calderwood, and Clinton-Cirocco (1986) noted through their direct observations of fireground incident commanders that under time pressure, they typically think of a single option without any consideration to alternatives and they are ready to respond. RPD is a valuable tool when it is not possible for the decision maker to conduct an in-depth analysis and, thus, the decision maker must move quickly to a viable solution once a familiar pattern is recognized (Sayegha, Anthony, and Perrewe, 2004). The pace, uncertain conditions of fireground operations, especially during the initial deployment of resources, has proven to be ideal conditions for RPD. As Klein (2003) noted, fireground commanders recognize that it is better

to make a good decision quickly and prepare to execute it well rather than agonizing over the "perfect" choice that comes too late. We can rarely know what the best choice is, and the quest for it can drive us to obsess over inconsequential details (p. 71).

Simon (1986) contends that intuition lies in the organization of knowledge for quick identification. Intuition and judgment, at least good judgment, are simply analyses frozen into habit and assembled into the capacity for rapid response through recognition. There is a fundamental link between training, experience and technological competence that provides the knowledge required to make intuitive decisions. Therefore, intuition is about sifting rapidly through your memory bank of past experiences in order to make decisions. You are, in fact, searching for familiar patterns and are not making decisions in a vacuum (Rogers, 1994). But as Walls (2003) points out, RPD is not without its downside.

Our intuition sometimes leads us to wrong conclusions because it is closely related to a powerful mechanism of the human mind called pattern recognition. Pattern recognition has emerged out of millions of years of evolution to become the brain's way of efficiently processing large amounts of information, similar to programming techniques that use subroutines. These embedded patterns allow us to sort information quickly into packets and access only the relevant bits instead of searching through our entire database of experiences. When we are required to solve new problems with limited information, our brains draw on the existing, known patterns and then they fill in details based on prior experiences. Sometimes those patterns lead to the wrong conclusion. When this happens, the incident commander can make decisions that have significant consequences on the fireground. (p. 20)

Even researchers who profess the virtues of intuition caution that intuition is not always the best decision-making tool. Klein (2003) noted that some complex and uncertain tasks make intuition hard to use, noting that it is hard to develop intuition based on pattern matching when the situation you are trying to resolve is complicated. Clearly, the ability of fireground commanders to always recognize the right patterns and to match those patterns properly with the mental models is not fool-proof.

### *Pros and Cons of Using an Intuitive Decision-Making Process*

Many intelligence reports on a fireground are contradictory; even more are false, and most are uncertain. So, even if a decision is reached through detailed analysis of factors, the soundness of the decision will depend on the correctness and completeness of information. Comparing the uncertainty of fireground decisions to unpredictable wartime decisions, Rogers (1994) tells us that it is impossible to weigh all the relevant factors for even the simplest decisions in war. It is the military leader's intuition that must ultimately guide him in effec-

tive decision-making.

Timeliness is critically important. In many military scenarios, time is too scarce to conduct a full, comprehensive estimate. Shortcuts must be taken. This requirement increases as the command level reduces. At the brigade or division level, the commander's use of intuition will depend on the time available, perhaps from complete reliance on intuition in tight situations to using intuition as only one of several decision-making tools in the formal written estimate (McClellan, 1995). The most important advantage of reaching a decision intuitively, rather than by a consciously conceptualized process, is speed. Making speedy, accurate decisions in multiple battlefield scenarios is a war-winning command quality that commanders should hone, and using intuition helps overcome the military decision-making timeliness problem (McClellan, 1995).

A disadvantage of intuitive decision-making is the credibility lost due to the inability to document the intuitive thought process used by the commander to make the decision (McClellan, 1995). Commanders' decisions, especially those involving risk to life, are increasingly subject to intense scrutiny and criticism by the public and media. Decisions not supported by written proof or sound, rational reasoning processes are likely to be viewed as not credible. The competent manager or professional is supposed to be seen as a rational person and a master of analytical techniques. Intuition is perceived as too soft and irrational (Holder, 1995). Critics have characterized intuition as a fragile quality that can be easily undermined by stress, unreliable information or the overbearing pressure to make a rapid decision.

An important first step for individuals to take is to acknowledge intuition's existence and potential. One must develop a clear reality perception, not a distorted ego view. This means undertaking exercises and open discussions about human behavior and thinking (McClellan, 1995). As Klein and Weick (2002) aptly noted:

If your home were on fire, you would not want a highly trained decision analyst, armed with a manual of firefighting procedures, in charge of the operation. The weakness of an intuitive approach is that intuition is not enough. We do not want rookie intuitive accountants, or intuitive surgeons, or intuitive lawyers. We want people who have studied and trained and then gone out and gained experience. (p. 17)

The basic personality type of a fireground commander can be determined through the application of personality indicator tests such as the Myers-Briggs Type Indicator, which has been used for more than 50 years by the military (McClellan, 1995). Once the fireground commander's basic personality type is identified, the challenge is to display a level of self-discipline in balancing their decision-making approach when their predominant style is either heavily analytical or deeply intuitive. As Walls (2003) notes, a purely analytical thought process can be very time-consuming and

inefficient. On the other hand, a purely intuitive thought process can quickly produce conclusions that are obvious but wrong. The interplay of intuition and analytical thought is indispensable in solving management problems. Both approaches are important and neither is better than the other (Walls, 2003).

Psychologists now believe that far from being the opposite of effective decision-making, intuition is inseparable from it, claiming that without intuition we could not decide anything at all. Research suggests that neither nose-in-the-spreadsheet rationality nor pure gut inspiration is right all the time. The best approach lies somewhere between the extremes. The exact point depends on the situation (Stewart, 2002). If Stewart is correct, incident management might be enhanced if the IC utilized a blended approach using both rational analysis and intuition. In such a scenario, an IC could use a rational decision-making process knowing that intuition cannot always be trusted and would also rely on their intuition, knowing that a rational decision-making process is not always enough. For example, the IC might utilize a checklist that takes the decision-making through a step-by-step process, assuring that all steps are completed or, at the minimum, thoroughly considered. At the same time, the IC should be aware that the presence of a "gut feeling" that contradicts the rational information being gathered should not be ignored, but explored.

The rational decision-making process has critical drawbacks. The obvious limitation is that it takes time to use. The rational decision-making process is insufficient for making high-stakes decisions under time pressure and uncertainty (Klein and Weick, 2000). The deliberation needed to transform a continuous stream of complexity into discrete problems, options, and consequences suitable for analysis consumes scarce time and resources. It also takes a fair amount of data. If you have too many gaps in the analysis, you can get stuck. Klein and Weick (2000) further tell us that if the situation keeps changing, the results of the analyses can quickly become obsolete. For example, imagine being assigned the task of procuring the appropriate number of ambulances to transport injured victims to area hospitals after a tornado has devastated your town. You may conduct an initial analysis based on the initial damage assessments, the path of the storm, the strength of the tornado, estimated homes and businesses affected, time of day, etc. Chances are, you will develop a "gut feel" based on intuition for the number of casualties. For example, if the path of the tornado went through a school and mall in the middle of the night, you could intuitively estimate the number of casualties from those facilities to be low. Take the same path during the middle of a school/shopping day and the casualty estimates will be much higher and the officer will not have the luxury of time to conduct a comprehensive rational choice decision process.

Historically, fireground incident management experts taught the importance for commanders to collect,

record, and organize information to make rational decisions (Brunacini, 1985, p.6). Newer curriculum explains and reinforces the differences between classical (rational) decision making and the use of intuitive decision making, also referred to as naturalistic decision making (Chief Fire Officer Training Curriculum Instructor Guide, 2003). This shift in fireground incident decision making may, in part, be attributed to the work of Dr. Gary Klein and his associates and their studies of fireground decision makers and the comparisons made to military commanders operating under wartime conditions. From this research, Klein learned that fireground commanders did not use rational decision-making processes. They did not weigh alternatives. They simply grabbed the first idea that seemed good enough, then the next, and the next after that. Klein's research made it clear that most command decisions were intuitive.

Fireground incidents are too fast-paced, ever changing, and unpredictable to facilitate the time-consuming, rational decision-making process. Commanders rarely have complete information available before making critical command decisions. Even if they believed they had complete and accurate information when they made their decision, some of the information is likely to change before or soon after their decision is made.

### Recommendations

This review results in a number of recommendations beneficial to fireground commanders and to those engaged in non-emergency fast-paced, high stress, ever-changing leadership roles. Training for incident commanders needs to include classroom and practical modules designed to blend the best of rational and intuitive decision-making processes. Potential fireground commanders should be evaluated using an instrument similar to the Myers-Briggs Type Indicator and the results used to develop decision-making opportunities. Evaluations should be completed after catastrophic fireground incidents to determine the decision-making style deployed by the fireground incident commander and to evaluate the role intuitive and/or rational decision-making processes played in contributing to the failure of, or prohibiting the success of, the incident. Finally, the further research is needed to identify practical methods to develop the intuitive decision-making abilities of fireground commanders.

### References

- Agor, W. H. (1986). The logic of intuition: How top executives make important decisions. *Organizational Dynamics*, 14, 5-18.
- Agor, W. H. (1990). *Intuition in organizations: Leading and managing productivity*. Newbury Park, CA: Sage.
- Brockman, E. N., & Anthony, W. P. (1998). The influence of tacit knowledge and collective mind on strategic planning. *Journal of Managerial Issues*, 10(2), 204-222.
- Brunacini, A. V. (1985). *Fire command*. College Park, MD: ybs Productions.
- Chief officer training curriculum instructor guide. (2003). Emmitsburg, MD: Federal Emergency Management Agency, United States Fire Administration.
- Clark, W. E. (1991). *Firefighting principles & practices*. Saddle Brook, NJ: Fire Engineering Books & Videos.
- Dreyfus, H. L. (1997). Intuitive, deliberative, and calculated models of expert performance. In G. A. Klein & C. E. Zsombok (Eds.), *Naturalistic decision making* (pp. 17-28). Mahwan, NJ: Erlbaum.
- Dreyfus, S. E. (1981). *Formal models vs. human situational understanding: Inherent limitations on the modeling of business expertise* (ORC 81-3). Berkeley: Operations Research Center, University of California.
- Damasio, A. R. (1994). *Descartes' error: Emotion, reason and the human brain*. New York: Putnam.
- Endsley, M. R., & Bolstad, C. A. (1994). Individual differences in pilot situation awareness. *International Journal of Aviation Psychology*, 4(3), 241-264.
- Ford, C. M., & Gioia, D. A. (2000). Factors influencing creativity in the domain of managerial decision-making. *Journal of Management*, 26(4), 705-732.
- Ford, J. D. (1985). The effects of causal attributions on decision makers' responses to performance downturns. *Academy of Management Review*, 10(4), 770-786.
- Friedland, N., & Keinan, G. (1992). Training effective performance in stressful situations: Three approaches and implications for combat training. *Military Psychology*, 4(3), 159-175.
- Gasaway, R. B. (2003). Ready! Fire! Aim! *Fire Engineering*, 156(8), 16-18.
- Giunipero, L., Dawley, D., & Anthony, W. P. (1999). The impact of tacit knowledge on purchasing decisions. *Journal of Supply Chain Management*, 35(1), 42-49.
- Harrison, E. F., & Pelletier, M. A. (2000). Levels of strategic decision success. *Management Decision*, 38, 107-117.
- Harari, O. (2002). *The leadership secrets of Colin Powell*. New York, NY: McGraw Hill.
- Holder, B. J. (1995) Intuition decision making. *CMA Magazine*, 69(8), 6.
- Huy, A. N. (1999). Emotional capability, emotional intelligence, and radical change. *Academy of Management Review*, 24(2), 325-345.
- Janis, I. L. (1982). Decision-making under stress. In L. Goldberg & S. Breznitz (Eds.), *Handbook of stress: Theoretical and clinical aspects* (pp. 69-87). New York, NY: Free Press, 69-87.
- Keinan, G. (1987). Decision making under stress: Scanning of alternatives under controllable and uncontrollable threats. *Journal of Personality & Social Psychology*, 52(3), 639-644.
- Klein, G. (2003). *Intuition at work*. New York: Doubleday.
- Klein, G. A., Calderwood, R., & Clinton-Cirocco, A. (1986). Rapid decision making on the fireground. In *Proceedings of the Human Factors Society 30th Annual Meeting* (pp. 576-580). Santa Monica, CA: Human Factors Society.
- Klein, G. A., & Weick, K. E. (2000). Decisions. *Across the Board*, 37(6), 16-23.
- Klein, G. (1997). The effect of acute stressors on decision making. In J. E. Driskell & E. Salas (Eds.), *Stress and Human Performance* (pp. 49-88). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Klein, G. A., Orasanu, J., Calderwood, R., & Zsombok C.E. (Eds.). (1993). *Decision making in action: Models and methods*. Norwood, NJ: Ablex Publishing Corporation.

- Kleinmuntz, B. (1990). Why we still use our heads instead of formulas: Toward an integrative approach. *Psychology Bulletin*, 107(3), 296-310.
- Koontz, K. (2001). Intuition gets real. *Health*, 15(9), 5+.
- Lazar, A. (1999). Deceiving oneself or self-deceived? On the formulation of beliefs under the influence. *Mind*, 108(430), 265-290.
- Lehto, M. R., Sharit, J., & Salvendy, G. (1991). The application of cognitive simulation techniques to work measurements and method analysis of production control tasks. *International Journal of Production Research*, 29(8), 1565-1587.
- March, J. G. (1994). *A primer on decision making*. New York, NY: Free Press.
- March, J. G. (1978). Bounded rationality, ambiguity, and the engineering of choice. *Bell Journal of Economics*, 9(2), 587-608.
- McClellan, B. C. W. (1995). Intuition in modern command philosophy. *Military Review*, 75(5), 96-99.
- Mintzberg, H. (1994). The fall and rise of strategic planning. *Harvard Business Review*, 72(1), 107+.
- Mintzberg, H. (1976). Planning on the left side and managing on the right. *Harvard Business Review*, 54(4), 49-58.
- National Emergency Training Center. (1989). *The incident command system*. Emmitsburg, MD: National Emergency Management Agency.
- National Research Council Staff. (1997). *Tactical display for soldiers: Human factors considerations*. Panel on Human Factors in the Design of Tactical Display Systems for the Individual Soldier. Committee on Human Factors. Commission on Behavioral and Social Sciences and Education, National Research Council, Washington, D.C.: National Academy Press.
- Norman, J. (1991). *Fire officer's handbook of tactics*. Saddle Brook, NJ: Fire Engineering Books & Videos.
- Overell, S. (2001). Trust your gut. *Director*, 54(12), 28.
- Pollock, T. (2004). Problem solvers. *Supervision*, 65 (3), 13-16.
- Rogers, C. T. (1994). Intuition: An imperative command. *Military Review*, 74(3), 38-51.
- Sayegha, L., Anthony, W. P., & Perrewe, P. L. (2004). Managerial decision-making under crisis: The role of emotion in an intuitive decision process. *Human Resource Management*, 14(2), 179-201.
- Simon, C. J. (1986). The intuitionist argument: A reexamination of the case for ethical intuitionism (Doctoral dissertation, University of Washington, 1986). *Dissertation Abstracts International*, 47, 1357.
- Stewart, T.A. (2002). How to think with your gut. *Business 2.0*, 3(11), 98-105.
- Ubel, P.A., & Loewenstein, G. (1997). The role of decision analysis in informed consent: choosing between intuition and systematicity. *Social Science and Medicine*, 44(5), 647-656.
- Walls, H. (2003). Things are not always as they seem. *Industrial Engineer*, 35(2), 20.
- Weick, K.E. (1990). The vulnerable system: An analysis of the Tenerife air disaster. *Journal of Management*, 16(3), 571-593.
- Wright, P. (1974). The harassed decision maker: Time pressures, distractions, and the use of evidence. *Journal of Applied Psychology*, 59(5), 555-562.

### About the Author

**Richard B. Gasaway** is a 27-year veteran of the fire-EMS service. He serves as the chief of the Roseville, Minnesota Fire Department. Chief Gasaway is a doctoral learner at Capella University with emphasis in leadership and organizational behavior. In 2003, Chief Gasaway was appointed by President George W. Bush to serve a four-year term on the Public Safety Officer's Medal of Valor Review Board. Chief Gasaway has authored over 60 articles on emergency services leadership and lectures throughout the United States and Canada on leadership issues for fire, rescue and EMS professionals. Chief Gasaway can be contacted at: [rich.gasaway@ci.roseville.mn.us](mailto:rich.gasaway@ci.roseville.mn.us).

Scott Somers, Ph.D. candidate, Arizona State University  
Phoenix Fire Department

## *Exploring the Efficacy of Computer-Based Training in a Workplace Setting*

### *Abstract*

*As training budgets become tight, fire and EMS organizations are looking for alternative methods of delivering recurring training to employees. One method of delivery is computer-based training. CBT has a number of characteristics that make it an effective alternative to traditional classroom lecture. However, training officers need to examine the effectiveness of current training practices and determine the extent to which these practices meet the needs of the organization and its members. This article reports on findings from a study of an EMS CBT program used to determine (a) if CBT is effective in fostering learning among EMT students and (b) whether CBT is accepted by EMTs as a method of didactic and critical skills training.*

For decades, state and local governments have been rendering or regulating emergency medical services (EMS) to their citizens. This may mean that fire departments deliver emergency medical services, or that ambulance companies (public or private) deliver such services. In addition to service provision itself, these governments accrue a large number of responsibilities associated with the ability to offer the service. Training is one of the most critical of these functions, but also the most challenging from the view of public human resource management (Shafritz, Rosenbloom, Riccucci, Naff, and Hyde, 2001). This is especially true in fire service organizations where personnel managers and training administrators have the rather daunting task of ensuring that employees maintain government certifications that directly impact the organization's mission. Such central government certifications often require a minimum number of continuing education hours covering specific topics and these may be above local government requirements. Governments often find that a large portion of their training resources are dedicated to meeting such externally mandated requirements (Forsman, 2002).

The purpose of this paper is to examine and report on a strategy for delivering continuing education to fire department-based EMS personnel working in a government or quasi-government setting. The essential strategy is to examine a management-devised computer based review and training program for personnel recertification. Such programs are an improvement over traditional classroom-based training in that the computer versions provide standardized, economical training in an environment that gives the learner maximum control over learning. The issue is that while such systems have been evaluated, there is little data available on the effectiveness of computer-based training in a workplace setting, including learning outcomes and differential receptiveness of personnel being trained (Porter, 1991). This paper reports on a case study of a computer based system among firefighter/EMT personnel in a large metropolitan fire department in the United States.

### *Statement of the Problem*

The traditional method for providing didactic EMS training is through a classroom-based lecture format. Due to concerns over the rising costs of providing externally mandated recertification training, “. . . more and more organizations are adding up the expense of putting employees in a classroom versus other platforms that use technology to deliver training to employees when they want it and where they want it” (Shafritz et al., 2001, p. 331). Computer-based training has the advantage of being anytime, anywhere learning that can conveniently provide training to a greater number of students at the same time. This creates an economy of scale that can be used to leverage more training or do existing training for less. As Brown (2000) explains, “costs decrease in proportion to the number of learners using [computer-based training] programs, whereas costs for classroom instruction increase in proportion to the number of learners” (p. 6). A white paper on distributive learning by the National Association of EMS educators notes the cost-efficiency (Distributed Learning Committee):

It eliminates the need for a physical space and increases the number of participants. It also allows multiple experts to contribute asynchronously, which removes some scheduling restraints. It reduces travel requirements and can reduce the cost of duplicating and distributing educational material. (p. 5)

While a number of studies in the medical fields have shown computer-based training to be equal to or greater in effectiveness than traditional classroom lecture (Porter, 1991, Cohen and Decaney, 1994; Fleschi, Fleschi, Soula, and Degoulet, 1994; Belfry and Winne, 1998), learning in a computer-based environment is not a given. It not only requires experience, but also reflection. Personnel using CBT may not properly plan and dedicate time necessary to complete their studies nor have the intrinsic motivation necessary to succeed in an environment of independent study (Brown, 2000).

They may choose to simply get through the material as quickly as possible or even “cheat” the system by having others complete their training for them. Learner choices such as these may be influenced by the student’s acceptance of computer-based training as a means of delivery. This acceptance can be influenced by the design and content of the program as well as any number of demographic variables. Understanding the antecedents and consequences of learner choices is a critical issue to understanding who will learn in this environment (Brown, 2000).

Previous studies of computer-based training, while useful in examining its educational potential, have had shortcomings with regard to their practical applicability in an actual workplace setting, especially one as unpredictable as the fire station. Studies regarding the efficacy of computer-based training have principally focused on the education of college students, such as nursing students (Day and Payne, 1987; Gaston, 1988; Gilbert and Lolacz, 1993; Halloran, 1995; Gee, Peterson, Martin, and Reeve, 1998), medical students (Andrews, Schwarz, and Helme, 1992; Dewhurst, Hardcastle, and Stuart, 1994; Christenson, Parrish, Barabe, Noseworthy, Willaims, Geddes, and Chalmers, 1998; Finley, Sharratt, Nanton, Chen, Roy, and Paterson, 1998), and occupational health students (Toth-Cohen, 1995) rather than public sector employees whose level of education and attitudes toward computers may vary greatly, and whose employment is contingent upon continued certification. In addition, these studies were conducted in a controlled setting using a focus group of high efficacy learners, as opposed to a real-world working environment. This methodology begs the question: will computer-based training systems that are designed to replace traditional didactic lecture be effective in a workplace environment with a workforce that has differing attitudes toward and experience with computers?

### *The Program Tested*

This research adds to the existing body of knowledge about computer-based training by examining the use of a CBT program in a workplace setting using a sample of emergency medical technicians from a large metropolitan fire department with nearly 1,400 members. The system fully replaced classroom-based didactic instruction previously taught at a local community college. The instructional program is completely self-paced and utilizes interactive multimedia and periodic assessments throughout the 15 instructional modules in order to provide realistic, ongoing and verifiable training. As part of the study, five demographic variables were identified and analyzed to determine whether or not these variables affected an employee’s attitude toward computer-based training and the design and content of the program. A review of recertification exam results was also conducted to evaluate the ability of the computer-based program to impart the necessary knowledge to allow users to meet their certification requirements.

### *Methods of Instruction: A Review of the Literature*

The measurement of student attitudes toward the method of instruction is based on Bloom’s (1971) theory on mastery learning, which states that the method of instruction affects the learners’ attitude toward the learning situation and its outcome. Positive attitudes toward the learning process can instill a sense of achievement in the students, enhance interest in the learning task, and motivate them to spend the time necessary for learning. Therefore, a student’s positive attitude can be related to learners’ choices that will improve knowledge gain and retention. A student who reports favorably about the learning process is more likely to pay attention to the lessons and, thus, more likely to be able to absorb the information and use it. The result is greater knowledge retention and recall.

Understanding what affects one’s attitude toward a particular training method begins with an examination of the characteristics of the adult learner. The theory of adult learning (called andragogy) can be applied to any form of adult learning and has been used extensively in the design of organizational training programs. Malcolm Knowles (1970) is considered to be a foremost expert in the field of adult learning and developed a comprehensive theory that centers around four principles. These principles state that adult learners (1) need to know why they are learning something, (2) need to learn experientially because they bring a variety of life experiences with them to the learning environment, (3) approach learning as problem-solving, and (4) learn best when the material is of immediate value to them. The presence or absence of these principles in a training program can directly influence the learner’s attitude toward the method of instruction.

A number of studies have focused on students’ attitudes toward computer-based training as a predictor of achievement. Belfry and Winne (1988) conducted a review of eleven studies that measured the effectiveness of CBT in relationship to traditional classroom lecture (TCL) in nursing education. They found that, by and large, students had a more positive attitude toward CBT than they had toward lecture. They also found that students who went through CBT scored higher on tests and learned the required material in less time than their TCL counterparts. Similar studies were conducted by Cohen and Dacanay (1994) and Fleschi, et al. (1994). In these studies 22 out of 29 study populations using CBT reported higher exam scores over those using the traditional lecture format. In six of these studies, the difference between the CBT and TCL scores was considered to be statistically significant (Knebel, 2000).

However, not every study produced similar results. Some found that users reported negatively about the use of computer-based training. In these instances, researchers attributed negative attitude to problems with program design or content (Day and Payne, 1984; Brudenell and Carpenter, 1990) or poorly designed software (Farabaugh, 1990). Reasons for critical

reviews of computer programs range from poor user control to inadequate feedback on progress to a lack of relevance to the job of the employee.

In addition to evaluating programs for proper design and relevant content, any assessment of the acceptance of computer-based training must consider a number of individual variables related to the users. For example, studies conducted by Colquitt, LePine, and Noe (2000) and Kubeck, Kelp, Haslett, and McDaniel (1996) found that an individual's age and level of formal education can influence learning-related beliefs and outcomes across many settings. According to Brown (2000):

Age may be a particularly relevant influence on learner choices and outcomes in computer-based training environments. [Increased] age may be associated with greater resistance to the idea of a computer replacing the training; this resistance may manifest itself in the form of less practice and time on task. (p. 279)

As indicated, these studies also found that an individual's level of education can predict differences in learning-related beliefs and outcomes across many settings. Firefighter/EMTs come from a variety of backgrounds and life experiences and have attained various levels of education--from general equivalency diplomas to associate degrees to graduate-level degrees. Therefore, it is necessary to consider how this demographic variable affects their acceptance of computer-based training as a viable alternative to lectures.

"The determinant of which training methods should be employed will depend on the subject matter, the instructional preferences of the employees involved and the appropriateness of the method to the organizational environment" (Shafritz et al., 2001, p. 312). However, these elements may not always coalesce. For example, while it may be advantageous for the organization to implement computer-based training in order to reduce costs or provide greater flexibility in training, unfamiliarity with the training format might lead to resistance to the change among potential users. In an evaluation of computer-based training for use in paramedic recertification training, Porter (1991) found that while computer-based training was successful in its utility, personnel reported a strong preference for the traditional classroom lecture format over the use of computer-based training. The author theorized that this was due, in part, to the respondents' familiarity with the didactic format.

Finally, Khoiny (1995) notes that the environment in which students use computer-based training can influence their attitudes toward this method of instruction. The environment of use includes such variables as accessibility to computers, availability of the training software, and students' use of computer terminals. Loudermilk and Fischel (1991) noted that students' frustration with computer-based training is caused by limited computer access and the lack of availability of

the software program when needed. Indeed, in a fire service operations environment, access can be interrupted by the daily station routine or an emergency response. In addition, workstations often have only one or two computers that can be used for purposes other than emergency reporting; therefore, personnel may not be able to access a computer in order to use the training software when they have the time. This can negatively affect their attitude toward computer-based recertification training.

### *Study Methodology*

This study employs Kirkpatrick's (1959, 1960, 1996) model for evaluating training that consists of four levels. These include: (1) obtaining learners' reactions to training, (2) determining whether learning has actually occurred, (3) measuring the transfer that has occurred in learners' behavior due to the training program, and (4) evaluating how the training has contributed to the organization's mission and objectives. Although all levels of this model are utilized to some degree, this research primarily centers on gathering information regarding users' reactions to the training. This tactic provides administrators with valuable feedback from the trainee's perspective regarding the effectiveness of the learning process. This is the case since such reactions influence attitudes and can directly impact a trainee's intention to use computers for training or influence learner choices while using such systems (Allen, 1986; Brown, 2000).

As part of understanding levels of acceptance, characteristics of the individual EMTs were taken into account in the analysis. These variables include age, past experiences with recertification, and educational level. The users were also asked to assess their level of access to computers to determine if this variable had any effect on acceptance. The basic data gathering strategy involved drawing a probability sample of EMTs who had completed the computer-based training during the 12 months immediately prior to this study. The approach to the study involved executing the steps commonly used in sample surveys (Babbie, 1998). That is, a probability sample was taken of the population of EMTs who have taken the computer-based training. A sample size was used to achieve a 90 percent confidence level for estimation. This simply means that if the survey were conducted 100 times, the data would be within a certain standard deviation above or below the percentage reported in 90 of the 100 surveys. Three mailings of a questionnaire yielded a return of 67 percent (N=47). Babbie (1998, p. 240) reports that "...a response rate of 50 percent is adequate for analysis and reporting. A response rate of 60 percent is good. And a response rate of 70 percent is very good." Therefore, the return rate for the attitudinal survey is more than sufficient for analysis and reporting.

The multiple-part questionnaire was developed to assess levels of acceptance, computer anxiety, and other factors. In all, three scales were used to measure

different aspects of attitudinal acceptance. Of the three scales developed, one scale addressed EMT attitudes toward computer-based training in general (ATTITUDE Scale), one scale addressed attitudes toward the design of the program (DESIGN scale) and the third scale dealt with attitudes toward the content of the program for EMT recertification (CONTENT Scale).

The process used for construction and scoring the three scales followed standard social science practice. Each question was combined or scaled using "sum-mated ratings" or a Likert-type scale (Edwards, 1957). The items in the scales used the traditional Likert response format of five choices: Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree. Each positive item response was assigned a numeric value beginning with Strongly Agree = 5 and continuing through Strongly Disagree = 1. Appropriate negatively stated items were reverse scored so that when the scale was summed responses would be expressed as low scores for low acceptance of computer-based training and high scores for high acceptance (McIver & Carmines, 1981, pp. 24-26).

Each of the scales was tested for reliability by means of a "test-retest" technique, which is appropriate for Likert scales (Edwards, 1957). Five currently certified emergency medical technicians formed the group on which each scale was pre-tested. The scales were administered at a "time one" point, then the order of presentation of the items was randomized and the scales re-administered to the same group six days later. For the purpose of planning, the time required for each emergency medical technician to complete the questionnaire was recorded and comments on each item were solicited. The time required to complete the scales ranged from 5 to 10 minutes. The Pearson's Product Moment Correlation Coefficient ( $r$ ) between first administration and second administration for each scale was:  $r = .92$  for attitude toward computer based training;  $r = .85$  for attitude toward program design; and  $r = .86$  for attitude toward program content. Using Edward's (1957) criterion that correlations above  $r = .80$  represent acceptable reliability, the scales were determined to be reliable.

Finally, no manner of instruction, whether computer-based training or traditional classroom lecture, has any value to an organization if the student does not acquire the cognitive knowledge necessary to successfully pass the EMT recertification exam. Reviewing the exam results from the previous twelve months and comparing first-time passing rates for personnel who had taken the computer-based training program to those of students who had completed a traditional classroom lecture format during this same period evaluated the effectiveness of the CBT program. Selecting the sample in this manner limits the variations in the exam, thereby reducing the possibility that the test itself becomes a variable in the measurement of first-time pass rates. The exam was developed and tested for validity and reliability by the training staff of the local community

college. It is based on a prescribed standard of knowledge, skills, and abilities (KSAs) that are required for EMT certification as determined by the Arizona Department of Health Services' Bureau of Emergency Medical Services.

With reference to EMT testing, it is generally acknowledged that it is not practical (in terms of time, etc) to test each person applying for EMT certification for all the KSAs identified by the testing authority. Each test, therefore, contains only a sample of "critical" KSAs selected by the testing authority. Because it is desirable to change the set of questions on every EMT exam, each test may be systematically varied in one of two ways: (1) the testing authority may choose to create "different" tests by varying which critical KSAs are selected for measurement or (2) the testing authority may vary the wording or approach so they can measure the same KSA. Without regard to these differences in "composition" of the measurement instrument (the exam), each exam is conceptualized as a measurement of the larger body of information that "all EMTs" should possess. Thus, one can look at "certification" as an indicator that an individual has demonstrated possession of the target information. It is reasonable that the "exam" for such certification may vary from administration to administration. Since each "exam" measures critical KSAs, it is methodologically reasonable that the culmination of the testing processes—certification—represents evidence that the individual has mastered the information needed to be an EMT.

## *Findings*

### *Scales*

The ATTITUDE scale constructed for this project measured the EMT's attitude toward computer-based training and the reported level of comfort using this training method. Five questions addressed this issue and each was presented as a positive statement. Table 1 shows the distribution of answers to these questions. The lowest score on the ATTITUDE scale was 2.2, indicating a less than positive attitude, while the highest score was 5.0 indicating a very positive attitude toward computer-based training. The mean score was 4.02 with a standard deviation of 0.66, indicating that the average respondent was slightly above a positive attitude. In fact, the overall attitude toward computer-based training was very positive, with only two EMTs obtaining an overall score below neutral. Responses to questions regarding ATTITUDE indicated that EMTs felt that the use of CBT was appropriate for teaching this subject matter.

The DESIGN scale measured how positive the individual EMT felt toward the design of the Department's EMT computer program. Specifically, questions related to design dealt with the learning objectives, whether lessons accomplished the learning objectives, feedback, testing, level of user control, practice opportunities, and whether material was presented in a logical

**Table 1: Preference for computer-based training (N=47)**

	Comfortable Using CBT	Prefer Computer Over Classroom	Intimidated by CBT	CBT Appropriate for EMT Re-Cert	More CBT Appropriate
<b>Strongly Agree</b>	31.9%	40.4%	2.1%	27.7%	21.3%
<b>Agree</b>	61.7%	42.6%	8.5%	53.2%	46.8%
<b>Neutral</b>	4.3%	10.6%	12.8%	14.9%	17.0%
<b>Disagree</b>	2.1%	4.3%	42.6%	2.1%	12.8%
<b>Strongly Disagree</b>	0.0%	2.1%	34.0%	2.1%	2.1%

sequence. Table 2 summarizes the firefighter ratings of the adequacy of these features. The lowest score on the scale was 2.57, while the highest score was 4.71. The mean score was 3.7 with a standard deviation of 0.45; this indicated that the average person was somewhat more positive than negative about the design of the CBT program. Another way of saying this would be that the average respondent felt certain that the design of the program was positive rather than neutral or negative. All but three of the EMT scale scores were above the neutral position of 3.0. These statistics indicate that with only a few exceptions all of the EMTs felt positively about the design of the program.

**Table 2: Program Design Issues (N=47)**

	Clear Objectives	Objectives Accomplished	Adequate Feedback	Testing Appropriate	Sufficient Control	Adequate Practice	Logical Sequence
<b>Strongly Agree</b>	14.9%	10.6%	12.8%	12.8%	0.0%	8.5%	10.6%
<b>Agree</b>	80.6%	80.9%	68.1%	66.0%	27.7%	61.7%	10.6%
<b>Neutral</b>	4.3%	8.5%	12.8%	12.8%	17.0%	23.4%	68.1%
<b>Disagree</b>	0.0%	0.0%	6.4%	8.5%	42.6%	6.4%	10.6%
<b>Strongly Disagree</b>	0.0%	0.0%	0.0%	0.0%	12.8%	0.0%	0.0%

The third scale constructed was the CONTENT scale, which measured positive attitude toward program content. Firefighter/EMTs were asked about two classes of issues relative to program content: (1) the way content was presented and (2) the relevance of content. With respect to the first issue, questions were asked about program graphics, whether the material was at the appropriate level for an EMT-Basic, and whether the material was technically correct. The second aspect of program content assessed dealt with the relevance or practical value of the information presented in the modules. Four questions were used to obtain feedback from firefighters on job relevance, application of material, and usefulness in preparing for the recertification exam. Responses to these questions are summarized in Table 3.

The lowest score for CONTENT was 2.57 and the highest score was 4.88. The mean score on the content scale was 3.6 with a standard deviation of 0.49. Again this score places the mean of the EMT ratings above the neutral value (3.0) and approaching a positive value of 4.0. Only 4 EMTs showed a scale score at or below a neutral attitude (3.0). Thus, the overwhelming majority of the EMTs positively endorsed the content of the EMT

re-certification program indicating that the material was relevant to the job of an EMT and useful in preparing members to pass the recertification exam.

### *Demographic Variables*

*Age.* The first demographic variable analyzed was age. Only a small proportion of the EMTs fall into the younger categories: 4.3 percent are 18-25 years old and 8.5 percent are 26-33 years old. The largest single category is 34-41 years old (36.2 percent). Nearly 30 percent of the EMTs are between 42 and 49 years old, while more than 20 percent are 50 years or older.

The correlation ( $r$ ) between EMT age and attitude toward computer-based training is  $-.57$  and is statistically significant at the  $.05$  level. This tells us that as age increases, the individual's attitude toward computer-based education becomes less positive. The correlation coefficient squared ( $r^2$ ), also known as the coefficient of determination, can be used to measure the proportion of variance in the dependent variable that is explained by an independent variable. In this case, 33 percent of the variance in attitude toward computer-based education is explained by age alone. Furthermore, positive perception of the program's content ( $r = -.53$ ,  $p < .05$ ) is negatively and significantly correlated with age. Although age is also negatively correlated with perception of program design ( $r = -.28$ ), the correlation coefficient is not statistically significant. As expected, older EMTs are less comfortable with computer-based training, and also less comfortable with the design and content of the program.

*Level of Education.* Only small numbers of EMTs are at the anchor ends of the education scale: 4.3 percent have only a high school education and 2 percent have completed graduate work at a university. The largest single proportion of EMTs (44.7 percent) have

**Table 3: Content Issues (N=47)**

	Adequate Graphics	Content at Level of EMT-Basic	Content Technically Correct	Relevance to EMT Job	Have Applied Information	Useful Exam Preparation	Materials Related to Exam
<b>Strongly Agree</b>	14.9%	12.8%	6.4%	12.8%	10.6%	4.3%	10.6%
<b>Agree</b>	76.6%	68.1%	70.2%	61.7%	57.4%	70.2%	80.9%
<b>Neutral</b>	8.5%	4.3%	21.3%	10.6%	27.7%	14.9%	8.5%
<b>Disagree</b>	0.0%	12.8%	2.1%	14.9%	4.3%	8.5%	0.0%
<b>Strongly Disagree</b>	0.0%	2.1%	0.0%	0.0%	0.0%	2.1%	0.0%

completed two years or less of college. About one-fourth of the group has finished an associate's degree, while another quarter has finished a baccalaureate degree.

As one might expect, higher levels of education are correlated with greater levels of comfort with computer based training. ( $r = .28$ ). In the bivariate case, about eight percent of the variance in attitudes toward computer based training is explained by educational level ( $r^2 = .08$ ). But the correlation coefficient is not large enough to reach statistical significance, indicating that differences in positive attitude toward computer-based training are not large between different categories of education. In fact, while this relationship is positive as predicted, the low amount of explained variance and the lack of significance suggest that continued education in itself does not make EMTs more comfortable with computer-based training.

When we look at program design and content, we find that they are negatively related to level of education. The DESIGN scale correlated at a level of  $-.24$  ( $p > .05$ ) with education, and the CONTENT scale produced an  $r$  of  $-.26$  ( $p > .05$ ). One can speculate here that these negative relationships occur because as people experience higher levels of education, they become more critical of issues of design and content in computer instruction. However, it should be pointed out that these two correlation coefficients are not significant. This suggests that as a variable to explain EMT perceptions of computer-based training, education is of very limited power. Perhaps the specific type of education and the extent to which that education was dependent on computer training are more important in this context. Clearly, more research is required.

*Number of Recertifications.* With regard to EMTs, the number of times an employee has been exposed to the traditional lecture format through prior recertification experiences may affect their acceptance of computer-based training as an instructional format. The two extreme values for recertifications include the smallest proportions of EMTs: 8.5 percent have never recertified and 12.8 percent have recertified 10 or more times. The largest proportion of EMTs have recertified between one and three times (31.9 percent). This compares with 23.4 percent who have between 4 and 6 recertifications and another 23.4 percent who have between 7 and 9 recertifications.

The number of recertifications was negatively correlated with attitude toward computer-based training ( $r = -.48$ ,  $p > .05$ ). This correlation coefficient shows that the more times a EMT had recertified, the less positive he/she is about computer-based instruction. In the bivariate case, the number of recertifications explains over 20 percent of the variance in attitudes toward CBT ( $r^2 = .23$ ). This negative relationship also carries over to program content and program design. The coefficient between number of recertifications and positive perception of program design is  $-.40$  ( $p > .05$ ), indicating that people with more recertification experience tended to like the design of the program less than others. The correlation coefficient between number of recertifications and the content scale is  $-.23$  ( $p > .05$ ). The direction of the relationship remains negative, but the size of the correlation is small and not significant.

The most probable reason for this pattern is that number of recertifications is positively correlated with age, and age is negatively correlated with attitude, design and content. In fact, the Pearson's  $r$  between age and number of recertifications is  $.90$ , indicating that more than 80 percent of the variation in number of recertifications is explained by age alone. Consequently, in these data the number of recertifications an employee has depends on (or is positively correlated with) age; it is age that colors the negative relationships reported between number of recertifications and attitude, design, and content. In order to adequately test this hypothesis about the relationship between the number of recertifications and age, a population would have to be found where there were both older and younger people who had differing levels of experience with recertification. That is, a population to study is needed in which there are a larger number of older people who have fewer recertifications. In the group studied here, the young people were newer on the job and thus had limited recertification experiences.

*Accessibility.* Judged on the basis of response to computer-based training, program design and program content, it is clear that the EMT recertification training on computer is positively viewed by nearly all who were questioned. However, the positive assessment begins to fade when the performance of the program is examined. Table 4 shows responses to direct questions about their access to a computer, boredom, and program operation. Although more than 78 percent of the EMTs felt they had sufficient access to a computer to

work on the modules while they were in the fire station, nearly 75 percent of the respondents reported that they were frequently interrupted while trying to complete the lessons. The ACCESS scale showed a Pearson's Product Moment Correlation Coefficient of .70 ( $p < .05$ ) with attitude toward computer-based instruction. This strong positive and statistically significant correlation indicates that almost 50 percent ( $r^2 = .49$ ) of the variance in attitude is explained by access. Thus, people who had more access to the computer were much more likely to express a positive attitude toward computer-based instruction.

It is also unclear whether the method of instruction had any effect on their initial failure. However, all students who failed the initial recertification exam passed on the second attempt without remediation.

Of the four demographic variables explored in the study, age showed the greatest correlation with acceptance of computer-based training. These findings may be related to the differences in the learning experiences between older and younger learners. A few decades ago, EMTs were hired largely from the blue-collar trades such as the construction industry. Few had any exposure to computers in their work environment until

**Table 4: Program Performance (N=47)**

	Sufficient Access Station Computer	Lessons were Boring	Program Operated Properly
Strongly Agree	23.4%	10.6%	0.0%
Agree	55.3%	57.4%	17.0%
Neutral	10.6%	27.7%	23.4%
Disagree	8.5%	4.3%	53.2%
Strongly Disagree	2.1%	0.0%	6.4%

**Recertification Exam Results**

A population of EMTs who took the EMT recertification test over a twelve month period was examined for statistical difference in first-time pass rates between two groups including (1) those who utilized the computer-based training program and (2) those students who decided to participate in the traditional lecture format. A total of 506 EMTs completed the CBT modules. Of that group, 5 failed to pass the recertification test on the first try. Of the members who took the 4-day lecture format at a community college, all successfully passed the test on the first attempt. Calculating the difference of proportions, the Z-score is 1.23,  $p > .05$  (Blalock, 1979). These results indicate that there is no statistically significant difference (of proportions passing) between the two groups. In addition, all five of the EMTs who failed to re-certify on the first test, passed on the second attempt without remediation.

the late 1980s when organizations began to use mobile data terminals on response apparatus and ambulances. Even then, the interaction between the computer and the EMT was limited to pushing a single button to indicate the unit's status. In addition, older EMTs are not likely to have had the opportunity to experience computer education or training during their formal schooling. Many high schools did not begin receiving computers until the late 1980s and colleges and universities did not require computer competency as a condition of graduation until relatively recently. Conversely, younger EMTs are more likely to have had computer training in school and thus are more apt to feel comfortable in a CBT environment.

**Discussion**

The results of this study indicate that EMTs were nearly universally comfortable using computers for EMT training, with the caveat that older employees were somewhat more uncomfortable than their younger counterparts. For the most part, EMTs felt positive about the design of the program and the content was well received. Perhaps most telling is the effectiveness of the program in imparting the basic KSAs necessary for the department's members to pass the EMT recertification exam. Very few EMTs had difficulties passing the exam on the first try. This study did not attempt to explain what caused their initial problems in passing the recertification exam. One might speculate that the employees did not plan or dedicate the time necessary to succeed.

**Conclusion**

Clearly, the use of technology for the delivery of training has begun to make its way into public organizations, and the fire service is no exception. Computer-based training has a number of characteristics that make it an effective alternative to traditional classroom lecture (Porter, 1991, Cohen and Decaney, 1994; Fleschi, et al., 1994; Belfry and Winne, 1998). These advantages include being an anytime, anywhere learning that can conveniently provide training to a greater number of students at the same time. In addition, it "allows for creative combinations of text, animation, video, hypertext linking, drill, and self-tests with immediate feedback..." that help capture the user's attention and interest in the training (Distributed Learning Committee, 2003, p. 14).

However, employees may resist attempts by their agency to implement computer-based training. Such resistance to training delivery methods can lead to learner choices that decrease training effectiveness

(Brown, 2000). The results can include loss of certifications, poor employee performance, and decreased service levels to customers. As such, fire department personnel managers need to conduct demographic analyses specifically paying attention to protected class employees, including older workers. They also need to examine the effectiveness of current training practices and determine the extent to which these practices

## References

- Allen, L. (1986). Measuring attitude toward computer assisted instruction. *Computers in Nursing*, 4(4), 144-151.
- Andrews, P., Schwarz, J., & Helme, R. (1992). Students can learn medicine with Computers: Evaluation of interactive computer learning package in geriatric medicine. *Medical Journal of Australia*, 157(10), 693-695.
- Babbie, E. (1998). *The basics of social research* (8th Ed.). Belmont, WA: Wadsworth.
- Belfry, M., & Winne, P. (1988). A review of the effectiveness of computer-assisted instruction in nursing education. *Computers in Nursing*, 6(2), 77-85.
- Blalock, H. 1979. *Social statistics* (Revised 2nd Edition). Columbus, OH: McGraw-Hill.
- Brown, K. 2000. Using computers to deliver training: Which employees learn and why? *Personnel Psychology*, 54(2), 271-297.
- Brudenell, I., & Carpenter, C. (1990). Adult learning styles and attitudes toward computer assisted instruction. *Journal of Nursing Education*, 29(2), 79-83.
- Christenson, J., Parrish, K., Barabe, S., Noseworthy, R., Williams, T., Geddes, R., & Chalmers, A. (1988). A comparison of multimedia and standard advanced cardiac life support learning. *Academic Emergency Medicine*, 5(7), 234-245.
- Cohen, P., & Decaney, L. (1994). A meta-analysis of computer-based instruction in nursing education. *Computers in Nursing*, 12(2), 89-97.
- Colquitt, J., LePine, J., & Noe, R. (2000). Toward an integrative theory of training Motivation: A meta-analytic path analysis of 20 years of training research. *Journal of Applied Psychology*, 85(5), 678-707.
- Day, R., & Payne, L. (1984). Computer managed instruction: An alternative teaching strategy. *Journal of Nursing Education*, 26(1), 30-35.
- Day, R., & Payne, L. (1984). Comparison of lecture presentation versus computer managed instruction. *Computers in Nursing*, 2(6), 236-240.
- Dewhurst, D., Hardcastle, P., & Stuart, E. (1994). Comparison of computer simulation program and a traditional laboratory practical class for teaching the principles of intestinal absorption. *Advances in Physiology Education*, 12(1), 95-102.
- Distributed Learning Committee. (2003). *Internet-based distributed learning in EMS education*. National Association of EMS Educators Whitepaper.
- Edwards, A. (1957). *Techniques of attitude scale construction*. New York: Appleton-Century-Crofts.
- Farabaugh, N. (1990). Maintaining student interest in CAI. *Computers in Nursing*, 8(6), 249-253.
- Finley, J., Sharratt, G., Nanton, M., Chen, R., Roy, D., & Paterson, G. (1998). Auscultation of the heart: A trail of classroom teaching versus computer-based independent learning. *Medical Education*, 32(4), 357-361.
- Fleschi, D., Fleschi, M., Soula, G., & Degoulet, P. (1994). Evaluation of computer-assisted instruction methods: An analysis from twenty-six studies from 1989-1992. *Pathologie Biologie*, 42(2), 183-190.
- Forsman, D. (2002). Training for fire and emergency response services. In D. Compton & J. Granito (Eds.), *Managing fire and rescue services*. Washington, D.C.: International City/County Management Association.
- Gaston, S. (1988). Knowledge, retention, and attitude effects of computer-assisted instruction. *Journal of Nursing Education*, 27(1), 30-34.
- Gee, P., Peterson, G., Martin, J., & Reeve, J. (1988). Development and evaluation of a computer-assisted instruction package in clinical pharmacology for nursing students. *Computers in Nursing*, 16(1), 37-44.
- Gilbert, D., & Kolacz, N., (1993). Effectiveness of computer assisted instruction and small-group review in teaching clinical calculation. *Computers in Nursing*, 11(6), 72-77.
- Halloran, L. (1995). A comparison of two methods of teaching: Computer managed instruction and keypad questions versus traditional classroom lecture. *Computers in Nursing*, 13(6), 285-288.
- Khojny, F. (1995). Factors that contribute to computer assisted instruction effectiveness. *Computers in Nursing*, 13(4), 165-168.
- Kirkpatrick, D. (1959a). Techniques for evaluating training programs. *Journal of ASTD*, 13(11), 3-9.
- Kirkpatrick, D. (1959b). Techniques for evaluating training programs: Part II-learning. *Journal of ASTD*, 13(12), 21-26.
- Kirkpatrick, D. (1960a). Techniques for evaluating training programs: Part III-behavior. *Journal of ASTD*, 14(1), 13-18.
- Kirkpatrick, D. (1960b). Techniques for evaluating training programs: Part IV-results. *Journal of ASTD*, 14(2), 28-32.
- Kirkpatrick, D. (1996). Revisiting kirkpatrick's four-level model. *Training & Development*, 50(1), 54-57.
- Kirkpatrick, D.L. (1998). *Evaluating training programs* (2nd ed.). San Francisco: Barrett-Koehler Publishing, Inc.
- Knebel, E. (2000). *The use and effect of computer-based training: What do we know?* Operations Research Institute Papers 1(2). Published for the U.S. Agency for International Development (USAID) by Quality Assurance Project (QAP). Center for Human Services, University Research Co., LLC.
- Knowles, M. (1970). *The modern practice of adult education: Andragogy vs. pedagogy*. New York: Association Press.
- Kubeck, J., Kelp, N., Haslett, T., & McDaniel, M. (1996). Does job-related training performance decline with Age? *Psychology and Aging*, 11(1), 92-107.
- Loudermilk, D., & Fischel, A. (1991). Computer simulations as a measure of nursing students' decision-making skills. *Journal of Nursing Education*, 13(3), 65-70.

Mclver, J., & Carmines, E. (1981). *Unidimensional scaling*. London: Sage.

Porter, R. (1991). Efficacy of computer-assisted instruction in the continuing education of paramedics. *Annals of Emergency Medicine*, 20(4), 380-384.

Shafritz, J., Rosenbloom, D., Riccucci, N., Naff, K., & Hyde, A. (2001). *Personnel Management in Government* (5 th Ed.). New York: Marcel Dekker.

Toth-Cohen, S. (1995). Computer-assisted Instruction as a learning resource for applied anatomy and kinesiology in the occupational therapy curriculum. *American Journal of Occupational Therapy*, 49(8),

821-827.

### *About the Author*

**Scott Somers** is a doctoral student in the School of Public Affairs at Arizona State University and is a member of the Phoenix Fire Department. His research interests include urban policy and governance, intergovernmental relations, and emergency management and planning. Scott can be

contacted at: [scott.somers@asu.edu](mailto:scott.somers@asu.edu).

**Dr. Harry Carter**  
Fire Protection Consultant

## *Approaches to Leadership: The Application of Theory to the Development of a Fire Service-Specific Leadership Style*

### *Abstract*

*The paper addresses the need for a leadership training program in municipal fire protection that reflects the most current research available in the field. The nature of the fire service and its operational environment is developed and presented. A review of leadership theory is conducted to identify the elements of a number of theories that apply to the unique characteristics of the fire service. The primary purpose of this paper is to provide an approach to leadership in the fire service that combines various aspects of the different commonly accepted leadership theories into an approach that best addresses leadership demands in the fire service.*

### *Introduction*

“Powerful trends will shape the fire service over the next ten years, changing department structures and roles in the community, and altering the demands placed on fire service personnel” (Jenaway and Gardner, 1994, p. 1). Marinucci (2003), Compton and Granito (2003), and the National Volunteer Fire Council (1993) suggest that fire departments may not be operating as efficiently as possible. In these studies effective leadership has been shown to be an essential element in the operational management of the fire organization. Compton (2003) makes this point quite clearly when he states that “the leadership skills required to effectively operate a fire department are very similar to the requirements for any organization” (*Fire Chief Handbook*, 2003, p. 205).

In this article, the nature of the fire service environment is explored and the specialized operational requirements of delivering fire services are discussed. The purpose of the discussion is to explore the mission of the fire service versus those questions that serve as the driving focus of this paper. A review of the literature is used to portray the many different aspects of a variety of leadership styles that are available for use by any person placed into a position that requires leading others. Elements of each are then extracted and explored as they specifically apply to the fire service environment. Fire fighting has classically been portrayed (Norman, 2002; Carter, 1998; Clark, 1991; Coleman, 1978; and Layman, 1952) as a labor-intensive undertaking that is normally performed under conditions of great immediacy and personal danger. This paper identifies and amplifies those indicators that portray the specialized nature of the fire service as a distinct profession within the emergency service world. The article then introduces the identifiable elements of leadership that will answer the query as to whether the emphasis on mission or on people is more critical within that environment.

### *Background*

The theories contained within this paper are based upon relevant studies in the fire protection literature. Organizational development theories that speak to the need for improving leadership within the fire service are also explored. The ultimate test of this paper’s hypothesis will come as the ideas expressed in these theories are actually applied to daily fire department operations; as such they will either be found effective and useful or found to be wanting and rejected.

The manner in which fire departments operate today has developed as a result of a variety of influences. The earliest fire organizations have been identified as existing within the Holy Roman Empire. Paulsgrove (2003) speaks of a Corps of Vigils as existing from the period 6 A.D. Fire service efforts in America date from the time of the Jamestown colonies in Virginia. From that time until the middle of the 19th Century, the bulk of the service was provided by people volunteering to protect their communities. Benjamin Franklin and other great Americans were volunteer firefighters.

Fire service organizations come in all shapes and sizes and have been at the heart of America’s infrastructure since well before the Declaration of Independence.

Membership in the volunteer fire service has been shown to be an important way for citizens to step forward and help their fellow citizens. It is an ancient and honorable avocation and is a way in which to serve the best interests of society. The challenges and dangers inherent in battling a wily adversary are many, but the rewards are great.

Participation in the fire service creates a series of intangible demands and rewards that brings a person into its midst for the purpose of doing good works. It has involved many generations of the same family and has served to provide a level of strength and support to its members in times of crisis. It requires a great deal of work, but it also allows for a great deal of personal joy and satisfaction in a job well done. Individuals are

asked to give their personal time to an activity that benefits the community. The value of the fire service in their lives has been such that people reprioritize their time to allow for their active participation in their local fire department. This influence has remained fairly constant through the years, and has allowed for the success of fire departments throughout North America.

Municipal fire protection is a generally accepted function of local governmental service that may be provided in a variety of ways. Robin Paulsgrove (2003) identifies the following as established ways in which fire protection and suppression services are delivered:

- The municipal public fire department (paid or volunteer)
- The fire bureau (a division within a public safety department)
- The county fire department
- The fire protection district (p. 7)

Leadership is a critical element in the provision of any service. Whether it is a private for profit corporation, a not-for-profit organization, or a public sector entity, leadership is the oil that lubricates the operational machine. Without effective leadership, the service delivery machine will eventually slow and come to a halt. This is particularly critical in an emergency service situation like the fire service.

Paulsgrove (2003), Cote (2003), Carter (1985; 1989), and Coleman (1978) suggest a correlation between diminished leadership skills and an increased danger to the members of the fire service as well as the citizen who expects to be protected by the fire service. If the service is not delivered in a timely manner and by individuals who are well led, lives are placed at risk. Since leadership is a critical element in the delivery of fire services, the search for the best way to provide the leadership for the lifesaving efforts of the fire department consumes a great deal of time and effort. This leadership impacts a number of tasks a fire department must perform during an emergency. These tasks include (Brunacini, 2002):

- Rescue of endangered life
- Protect life potentially at risk
- Stabilize the incident
- Stop the loss
- Fire control
- Property conservation (pp. 527-528)

It is also important to portray the environment within which these tasks are to be accomplished. Collins (2003) speaks to this when he states that “the level and nature of danger and challenge faced by ... fire and rescue services ... [are] increasingly frequent, lethal and destructive” (p. 554). Hamm (1990) set the tone for

this discussion within the fire service many years ago by noting:

Firefighting has become more complex since the ‘good old days’ and [that] promotion no longer depends upon political influence, seniority, or luck ... With the increase in fire hazards, the demand for greater knowledge in fire fighting operations ... the Fire Service, willing or not, will be forced to provide a new type of leadership – a more capable fire department officer. (p. 5)

A fire fighting operation consists of a wide range of important and interrelated physical tasks. They are all conducted within the intellectual framework of operations synthesized by individuals in leadership positions. Carter (1998) portrays these as follows:

- Rescue endangered occupants.
- Protect exposures (surrounding buildings endangered by the original burning structure).
- Confine the fire to the smallest area possible.
- Extinguish the fire.
- Ventilate to save lives and make a safer working environment for firefighters.
- Overhaul to fully extinguish fire and find the point of origin (where it started).
- Conduct salvage operations to limit damage to the fire building and contents. (p. 12)

The actions listed above are usually performed under conditions that are less than optimal. They are performed by individuals who are formed into groups. Paulsgrove (2003) tells us that fire departments, “like other organizations, are composed of people working together in a coordinated effort to achieve a common set of goals ... the most successful ... operate as a team” (pp. 7-11). These groups of individuals function best when led by an effective leader.

The development of effective leaders who are able to command respect and loyalty as well as function effectively in crisis-type situations would appear to be a precursor event to the delivery of safe and efficient fire fighting operations. The teams involved need leaders who can motivate those who they lead and coordinate and interface well with those to whom they report. As Hamm (1990) notes, officers should “be careful in maintaining allegiance to management or administration and by developing a wholesome respect for all fire department officers” (p. 66).

In summary, the literature indicates that the fire service is a specialized field that provides an essential emergency infrastructure service to the community under conditions that are often less than optimal. It also suggests that leadership is a critical element in the success of every organization. This importance is amplified

by the nature of the operational environment wherein the activity of fire suppression is performed.

### *Types of Leadership Reviewed*

Leadership has been portrayed within academia as a series of behaviors. Casimir (2001) uses a historical perspective to define his view of leadership. Based on the work of Bales (1950), he presents the view that leadership can be classified into the different types of interactions that can occur between group members. These interactions are typed as either “task-oriented” or “socio-emotionally oriented.” Next, Casimir (2001) turns to the work of Cartwright and Zander (1968). He notes their research suggests that “although there are numerous leadership functions ... [that] one or many members of the group could perform, most of these functions serve essentially two objectives: goal achievement (i.e., task-oriented) and group maintenance (i.e., socio-emotional)” (p.1). Casimir (2001) appears to suggest that the premise of this problem could be resolved if fire service leaders stuck to the task-oriented approach to leadership. The importance of leadership to organizational success forms a critical element in the development of the present study. Casimir (2001) made the critical point that performance-oriented behaviors, which are aspects of task-oriented leadership, constitute a sizable proportion of supervisory behavior. Based upon his comments it would appear that in order to achieve organizational success, leadership training should become a priority within the fire service. Hamm (1990) and Compton (2003) agree.

What are some of the different types and styles of leadership that may be used effectively by members of the fire service? A variety of leadership theories are reviewed below. Each style is compared to the criteria outlined previously as essential to fire service performance. Once again these criteria as defined by Brunacini (2002, pp. 527-528) are: (1) rescue of endangered life, (2) protect life potentially at risk, (3) stabilize the incident, (4) stop the loss, (5) fire control, and (6) property conservation.

Based on these six criteria, a review of the literature indicates the following leadership styles possess a number of characteristics appropriate to fire service leadership:

- Charismatic leadership
- Situational leadership
- Contingency leadership
- Citizen leadership
- Servant leadership
- The Transformational/Transactional leadership continuum

(1999), Compton and Granito (2002), Carter (1998), Clark (1991), Hamm (1990), and Coleman (1978) suggest that the conduct of fire fighting operations is a field of endeavor that should be accomplished by teams of well-trained, highly motivated firefighters. Each individual’s effort forms a part of the team’s overall efforts. Regardless of which style of leadership is considered, each would seem to portray the fact that such an approach must have a deep and abiding concern for the individual at its core. This concern for the individual is extremely important. Von Schell (1932) speaks of this necessity in his treatise on infantry combat. He states that as leaders “we must have some knowledge of the souls of our soldiers; because the soldier, the living man, is the instrument with which we have to work in war (p. 9).” Favreau (1973) takes a similar view when he urges leaders to “... know (their) men [and women] ... look out for their welfare ... (and) keep your men [and women] informed” (p. 29). This view complements Casimir’s (2001) view of leadership in that it suggests better levels of organizational performance when leaders are concerned for and care for their people.

### *Charismatic Leadership*

The basis for charismatic leadership lies in the strength and example of the leader. Nadler and Tischman (1990, p. 109) set the three primary criteria for this style of leadership in their discussion of envisioning, energizing, and enabling. These competencies provide an understanding of the power such charismatic leaders possess. These leaders have a vision of what they wish to accomplish. They exude an enthusiasm that inspires others around them to join with them in a pursuit of their vision. They are then wise and capable enough to be able to allow their personnel to do the best job possible.

In order to consider this as a style of leadership consistent with the needs of the fire service, it must be established whether this style of leadership has at its center a concern for the task or a concern for the individual. Nadler and Tischman (1990, pp. 110-111) also stress that certain limitations exist with this charismatic approach to leadership. They suggest that the following limitations indicate that this style of leadership may be directly attributable to the failings of the leader, and not the task or the people involved:

- The leader sets unrealistic expectations.
- People become dependent upon the leader.
- People become reluctant to disagree with the leader.
- The leader must deliver an aura of continuing magic.
- This approach is limited to the skills of the individual leader.

school of thought suggest that both the task and the people who will accomplish the task are placed at a lower level of importance than the leader themselves:

- Strong leader
- Leader with a vision
- Leader that followers can believe in
- One who energizes the group

It would appear that the bulk of the attributes and criticisms found within this style of leadership have an impact upon the people who must be motivated to accomplish a task.

### *Situational Leadership*

Hersey and Blanchard (1995) created a body of work at the United States Military Academy at West Point that explains their approach to situational leadership. Situational Leadership, according to the two leadership experts, is an attempt to demonstrate the appropriate relationship between the leader's behavior and the readiness level of the followers (Hersey & Blanchard, 1995, p. 207). They suggest that a leader's success depends upon their ability to understand and read the readiness of their followers in any given situation, hence the name situational leadership.

They go on to define the style more precisely: "Situational Leadership readiness is defined as the ability and willingness of followers to perform a particular task" (p. 207-208). An important part of their theory deals with the ability and willingness of the follower to perform those particular tasks. It is not enough that the leader knows how to manage people under this style of leadership. They must be sure that their followers are trained and willing to perform the task in question. It would appear that the Situational Leadership style requires a great deal of day-to-day interaction between leader and follower to insure that they are ready when the time comes to act. The importance of this is stressed by Favreau (1973) when he urges leaders to "...keep your men [and women] informed ...(and) train your men [and women] as a team" (p. 29).

It would appear that selected elements of the Situational Leadership style should be part of any training program used by the fire service in an environment that is almost always driven by the situation encountered. The concept of situation might well be broadened to include the task or tasks that must be accomplished in that situational environment. Howell (1997) makes reference to this when he suggests that greater success can be obtained "...by focusing attention on those sources of influence which can have an impact upon followers. The literature suggests an effective leader would be well served to focus their attention on certain aspects of the individual, task, and organization" (p. 1). The following attributes of situational leadership should be blended into the concept of leadership in the fire

service such that:

1. There should be a focus on the relationship between the leader and his or her followers;
2. There should be an understanding of the role of the follower and the role that the leader must play in creating effective followers; and
3. There should be a blending of task to the follower to create the greatest impact for the situation encountered.

### *Contingency Leadership*

Another theory similar to the Situational Leadership is that of contingency leadership. A review of the work of Fiedler (1967) and Utecht and Heier (1976) suggests that the basic premise of contingency leadership involves the relationship between task-orientation and relationship-orientation. In both the situational and contingency theories the willingness of the follower to perform is an important element. However, in the contingency approach issues of task orientation are paired with the relationship the follower has to the leader. In the Situational Leadership theory, the willingness of the follower to perform is based more upon the needs of the organization. Both theories speak to the interaction between leaders, followers, and organizational tasks, goals, and objectives. Three variables relate to the situations within which leaders and followers may find themselves:

- Leader-member relations
- Task structure
- Leader position power

The concept of contingency leadership is particularly critical to functions such as fire services that must often be delivered under times of stress, as the exigencies of the moment will not be known until the time of emergency crisis is encountered.

The importance of the leader in creating a healthy, competitive spirit is shown to be a key to organizational success. "Properly applied, a sound program of meaningful competition among small ... groups will materially increase the morale and psychological well-being of the individual in the work unit" (Fiedler, 1967, p. 44). Fiedler suggests it is the leader who is responsible for creating the proper situational environment wherein people derive satisfaction from their efforts. This would require the leader to understand the demands of the tasks at hand so that they can motivate the people to work toward a common goal. This appears to indicate a greater concern for people than for tasks. Thus, the following attributes of contingency leadership can be used to facilitate fire service leadership with a focus on people, rather than task situation:

- Use competition to strengthen teams.

- Know the individual workers in order to create a solid team.
- Show a genuine concern for team members.
- Possess a thorough understanding of the organization and its task structure.

### *Citizen Leadership*

A truly different sort of leadership falls within the theory of citizen leadership. In a free and democratic society, leaders can sometimes be expected to evolve from within a societal context. Cronin (1987) speaks to the warring conflicts of freedom and authority. He suggests that there is a dichotomy between the concepts of leadership and democracy. "We love to unload our civic responsibilities on our leaders, yet we dislike – intensely dislike – being bossed around" (p. 305). This creates a true friction within organizations existent within a free society. Cronin (1987) goes on to portray a type of leadership that is truly supportive in nature. He speaks of the view that leadership can be of "an enabling, facilitative kind ... conceptualized as an engagement among equals" (p. 306). This is a critical view, in that it speaks to the need for leaders to respect, encourage, and support their followers. Without the support of followers, there can be no leaders. Hence the researcher shows an indication that this style of leadership favors a people-orientation more so than a task-orientation.

This concern for the follower appears to be the basic component for creating effective citizen leadership. It is the need for equal treatment that differentiates this type of leadership from the others. The citizen leader evolves from within the organization, entity, or country; he or she emerges from a followership position. It should be noted that in many instances, the citizen leader accepts a leadership role reluctantly. This would appear to be the case in volunteer fire departments wherein leaders in the organization are chosen, perhaps even elected, by their associates to lead them. They are expected to exercise wisdom and restraint in their actions. If they are successful, they may remain in the position of leadership. If they are not successful, they are removed from office. Thus it is with the citizen leader.

The literature lists many examples where the incumbent leader emerges from the crucible of the moment. This can be particularly true within the confines of an emergency-oriented organization like the fire service. The very nature of the fire service suggests that every person, regardless of rank, unit designation, or assignment should receive leadership training. The fire service may be likened to a combat situation where leadership can pass to another suddenly and traumatically with the death or injury of an existing leader. So too does the fire service present the same potential for leadership turmoil. Von Schell (1932), for example, states that "we shall seldom have, at the beginning of a war, a proven commander, but we should have one who can inspire

the confidence of his troops ... as quickly as possible" (p. 45). It may be the same for the fire service.

The following attributes of citizen leadership support a preference for the person rather than the task. Once again the primary focus of this research effort is to examine each leadership theory as to its emphasis on people-orientation versus task-orientation:

- Flexibility is an important situational factor in leadership development.
- Training of people in leadership skills is critical on the chance that they may suddenly assume unforeseen leadership roles.
- A major concern exists for the individual talents of every member of the team.
- A historical perspective on the importance of the role of citizen leaders is required.

### *Servant Leadership*

In a democratic society, the concept of followers may be construed as somewhat demeaning. People should be valued as individuals and for their ability to make significant contributions to the success of an organization. The age-old entreaty that people should do unto others as they would have them do unto them, serves as the basis for the concept of servant leadership. Autry (2001) sets the tone for servant leadership when he states that true leadership, unlike management, is not just a set of skills and learned behaviors. Rather "[w]hat you do as a leader will depend on who you are" (p. 1). How leaders act and how they treat people serves as the basis for people's judgment of them. Autry (2001) offers a set of "Five Ways of Being" that serve as the underpinnings of his theory of servant leadership:

- Be authentic
- Be vulnerable
- Be accepting
- Be present
- Be useful. (p. 10)

These basic actions appear to be derivative thoughts that spring from the commonly-accepted "Golden Rule." If an individual is doing unto others as they would have others do unto them, each of the above acts, actions, or activities would be on the list of things to do. Duplicious people are never appreciated, regardless of their level of success. Under the concept of servant leadership, people are urged to be who they are and not to take on airs of false thought. Autry (2001) suggests that one way to do this is to be vulnerable. It may be that a leader will sometimes be duped by the actions of a follower. That is the price of being vulnerable and supportive. It will happen because of the fact that a good servant leader will accept people as they are. Leaders must be useful to those whom they have been granted the privi-

lege of supporting. Autry (2001) suggests that leaders make themselves available as resources. "Leadership is not about controlling people; it's about caring for people and being a useful resource for people. Leadership is not about being boss; it's about being present for people and building a community at work" (p.20).

This is the essence of servant leadership. It also serves as a moralistic approach to leadership. It is critical for any approach to leading to be morally correct. There is a mutual relationship between the leader and those being led that Burns (1978) describes as a relationship not only of power but also of mutual needs, aspirations, and values. He suggests that it is the strength of this interaction that establishes the level of success that an organization may experience. The following attributes of servant leadership are strongly indicative of a people-first orientation, a primary focus of this research effort:

- Servant leaders should be enthusiastic.
- Servant leaders should be vulnerable so that they can be open and receptive to the needs of others.
- Servant leaders should be accepting of others.
- Servant leaders should be available to meet the needs of their people when they occur.
- Servant leaders should be useful, proactive participants in the life of their organizations.

All of these suggest that a leader will achieve success in those cases where they support their people first.

### *The Transformational/Transactional Leadership Continuum*

A review of the literature offered by Dvir, et al. (2002), Burns (1978), Favreau (1973), and Hamm (1990) indicates that many believe that leadership cannot be separated from followers' needs and goals. It appears the chance for success comes when people feel that they have an interest in the tasks to be accomplished. Transformational leadership aims for an even higher level of achievement. Burns (1978, p. 101) suggests that such leadership occurs when one or more people engage with others in such a way that leaders and followers raise one another to higher levels of motivation and morality. He speaks of a binding together of the interests of the leader and followers into something greater than the acts of the individuals separately.

The work of Dvir, et al. (2002) shows transformational leadership theory to be a prominent representative of the theories discussed in leadership research in the last two decades. Follower development and follower performance are the targeted outcomes of such leadership. Based on the research of Burns (1978), Dvir and colleagues analyzed aspects of follower development such as motivation, morality, and empowerment. The research team worked with infantry officers in the Israeli Army. They created a series of field experiments that randomly assigned groups to leadership tasks. A series

of experimental groups received transformational leadership training. A control group received routine eclectic leadership training. Their results showed a better level of group performance for those members who were assigned to the experimental groups.

Support for transformation leadership is offered by research conducted by Turner, Barting, Epitropaki, and Milner (2002). Their findings indicate that transformational leadership training enhanced the performance of those teams that were led by individuals who had been trained in the leadership style.

Wofford, Whittington, and Gordon (2001) make an interesting argument for the comparison of the transformational and situational aspects of a leadership interaction. Their work suggests that there are situational limits on the use of a transformational style of leadership. They suggest that leaders adapt their behaviors to the individual subordinate rather than behaving the same way with everyone (Wofford, et al., 2001, p. 198). This suggests that a style of leadership is created that forms around the individuals being supervised in a given situation. Burns (1978), Kotter (1990), and Couto (1993) argue that a better leadership interaction occurs when the actions of the leader and those being led come together to form something greater than the sum of the individual actions. Their hypothesis that a symbiotic relationship can occur between leader and follower holds great hope for its use within the fire service. This hypothesis was borne out by the work of Dvir (2002) and his fellow researchers. Given the tight-knit teams that are used within a battleground environment that is intrinsically dangerous, the transformational approach to leadership appears to hold great promise for use within a fire service environment (Carter, 1998; Coleman 1978).

At the opposite end of the transformation/transactional leadership continuum, a different view of leadership is found. Transactional leadership has a different emphasis. This type of leadership is based upon a series of transactions between the leader and the person being led (Bass, 1990, p. 20). Employees who do well are praised and rewarded. Those who do not do well are punished. Bass (1990) suggests that the basis for this type of leadership lies within the area of power. He suggests that a transactional leader relies upon the power afforded them to give orders and guidance to those being led. Rather than tailoring the task to the employee, the transactional leader selects the people thought to be capable of accomplishing the tasks at hand. These people are then given the proper orders to assure that they understand what they are supposed to do. When they fail to do what they are supposed to do, they are punished. It would appear that there are as many disincentives at work here as there are incentives for proper performance.

The following attributes of transformational leadership are supportive of the concept of employee-worker

centered support for the people doing the work.

- Leaders must assess the relative worth of the individuals who make up their team.
- Transformational leaders must know and understand the needs of their organization.
- Transformational leaders must know and understand the needs of their people.
- Transformational leaders must possess the skills to create an environment wherein there is a high degree of correlation between the needs of the organization and the needs of the organizational members.

Transactional leadership also has a series of attributes that define the reasons for its task-oriented approach to accomplishing the work of the organization. Some attributes that show the true intent of transactional leadership are (Bass, 1985):

- May inspire loyalty (if orders of the leader are obeyed and expectations are met)
- Commitment may be gained from people (if they understand their place and know their job)
- Involvement of employees will be allowed in the performance of tasks, but not the creation of the methods to do the job (p. 27)

It is not difficult to assess the difference between these two styles of leadership. These two styles can be portrayed as the extreme ends of a continuum. Bass (1985; see also 1990) offers the following suggestions for arriving at a place where people are allowed to achieve more personal satisfaction:

- The leader should have a certain amount of charisma.
- The leader should be able to provide intellectual stimulation to those being asked to perform the work of the organization.
- The need to promote change and manage resistance to it has ... put an emphasis on democratic, participative, relations-oriented leadership. (p. 27)

The case for transformational leadership as a preferred alternative to transactional leadership appears to have received a good deal of support from Bass (1985, 1990), Dvir, et al. (2002), Carter (1998), and Favreau (1973). Each provides evidence showing the preferable results occasioned by the transformational type of leadership. Caring for people and providing support and motivation for them has evolved into the modern approach to leadership so as to gain the greatest effort and support from people within an organization.

### *Leadership in the Fire Service Context*

Research suggests that every organization must

have an effective form of leadership. In this case style does equate to substance. Just being a good leader is a start. In order for organizational success to occur, however, more must be done. Goals must be set, objectives developed, and plans and orders created to allow for the successful operation of the agency. This requirement exists in a fire department, just like any other organization. These make up the elements of structure, process, and behavior, as outlined by Gibson, Ivancevich, and Donnelly (2000). These form the framework of the organization, within which leaders begin their journey.

A number of leadership theories have been explored in this paper. As Kerr and Jermier (as cited in Howell 1997, p. 1) note, all of these models assume that some type of hierarchical leadership is needed and is important in formal organizations. The thesis of this article is quite simple: An approach to leadership in the fire service can be developed that combines various aspects of the different leadership theories into an approach that best typifies leadership demands in the fire service. With respect to the issue of leadership being people-oriented or task-oriented, the implications of this issue to the modern fire service is explored further below. But, first let's explore just a little more what leadership means.

Sternberg (2003) takes the view that typical definitions of leadership are too narrow and offers his "WIC" model as an example of a broadly construed construct of what leadership is and how it should be studied. He suggests that leadership is an amalgam of wisdom, intelligence, and creativity. The basic idea is that one needs these three components working together (synthesized) in order to be a highly effective leader (p. 386). Rost (1995, p. 129) takes a far more negative view of attempts at leadership research and definition. Either no one knows what leadership is because there is no commonly accepted definition, or everyone is supposed to have their own definition. Carter and Rausch (1998) support this position. They state that leadership has "as many definitions as there are people who have attempted to define the concept" (p. 26). These differing views suggest that a wide variety of opinions and definitions on the topic of leadership are present in the literature. It is this plethora of leadership styles that suggests the fire service may have special requirements that require a style suited to its unique situational requirements.

A number of basic definitions and views exist that provide support for this view. Bass (1990) tells us that "...leadership is one of the world's oldest preoccupations" (p. 49). Gardner (1990) goes on to add that "... the larger topic, of which leadership is a subtopic, is the accomplishment of group purpose, which is furthered by ... effective leaders" (p. 4). Cronin (1987) speaks of the process whereby "an individual or a few select individuals are in a position to provide the vision and make things happen" (p. 305). For purposes of this paper, Favreau (1973) provides a simple, basic definition of leadership within the fire service. He says that "leader-

ship is the ability to get something done, by someone else, because he (or she) wants to do it” (p. 27). George (1985, p. 26) provides a further perspective when he says that leadership is the elusive quality that inspires others to perform. It is a quality that enables a supervisor to influence others to accept directions freely and willingly. It is important to note that leadership involves the personal relationship that people create with other people. In many cases it involves the ability of a leader to use his or her personality to directly influence subordinates to accomplish a task. This is the type of charismatic leadership that Nadler and Tischman (1990) discuss. They speak of three separate components in the concept identified as charismatic leadership. They are:

- Envisioning
- Energizing
- Enabling (p. 108).

They add that these leaders use techniques such as:

- Articulating a compelling vision
- Setting high expectations
- Demonstrating personal excitement
- Expressing personal confidence and support
- Seeking, finding, and using success
- Empathizing (p. 108)

Favreau (1973, pp. 28-29) offers a number of functions that have guided leaders during military conflicts. These principles include: being technically and tactically proficient, knowing oneself, seeking self-improvement, knowing your employees and looking out for their welfare, keeping your fellow workers informed, leading by example, training employees as a team, seeking responsibility and taking responsibility for your actions.

Von Schell (1932) provides supportive evidence involving examples of leadership that occur within critical, life and death situations. This paper suggests that fire fighting has a number of similarities. The fire service manages:

- Situations involving life and death.
- Situations wherein decisions must be made quickly.
- Situations where decisions must be made without having all of the facts to make the decision.
- Situations wherein organizational members may be experiencing some level of fear and stress.

It is within these similarities that we find connections that bring the style of leadership used in the military into the world of the fire service. The first of these comes in the area of information available for decision-

making purposes. Von Clausewitz (1832, p. 162) states that the great part of information obtained in war is contradictory, a still greater part is false, and by far the greatest part is of doubtful character. Von Schell (1932) agrees: a leader “must nearly always issue orders [in combat] without exact information ... Our mission and our will are often the only things untouched by obscurity” (p. 31). Lopes (2003) alludes to the possibility that situations of a nature similar to those in war may well exist within the fire service environment. He states that “information is power. (This allows) more people (to) make informed decisions” (p. 32). Ergo if knowledge is power, the lack of information can be construed as a weakness. During a fire fighting operation, effective leaders must rely on those people who trust them to work diligently within a pressure intense environment. The leader’s ability to inspire people to labor on their behalf lies at the root of any success they ever hope to achieve.

A review of the literature suggests another apt comparison can be made between war and the fireground as another form of battlefield. Both are areas of danger, excitement, and uncertainty. Von Clausewitz (1987, p. 160) makes this quite clear when he says that danger in war belongs to its friction. He also speaks of the intoxication of enthusiasm. Von Schell (1932) further supports this position of combat-related friction based upon the continuing uncertainty of the combat environment. Difficult situations can only be solved by simple decisions and simple orders. The more difficult the situation, the less time there will be “... only the simplest order can be executed under such conditions” (p. 55). Fire service texts portray a similar picture. Carter (1998) creates an exciting portrait of the fireground when he states that “it has been said that we in the fire service perform at our best when surrounded by fire, smoke, and flames. All of our resources are brought together to control the enemy: fire” (p.11).

War and the dangers of the battlefield appear to require the same type of leadership that leaders on the fireground need to display. Both the military and the fire service deal with the concepts of strategy and tactics. The analogy holds true across the literature (see Brunacini 2002; Carter 1998; Clark 1991; and Coleman 1978). In discussing the attributes of leaders, Favreau (1973, p. 29) states that researchers exploring the actions and mental equipment of the truly great leaders discovered that there are many traits that are not always present in the art of leadership, along with a number of others that are always present. A further review of these characteristics and attributes points in the direction of a style of leadership that can be effective in a fire service environment. They are (Favreau, 1973):

- Confidence – (self confidence)
- Enthusiasm – (zeal)
- Effective human communication – (speaking, writing, and listening)

- Knowledge
- Vision (p. 29)

The preceding discussion on leadership has led to the development of a list of attributes and skills that need to be portrayed for our practicing fire service leaders. They are a distillation of many attributes found within the theories of leadership that were discussed earlier. These attributes will serve the fire service well during times of uncertainty and concern, and include: integrity, courage, honesty, pride, determination, faith, forcefulness, judgment, tact, decisiveness, endurance, initiative, responsibility, high principles, unselfishness, dependability, loyalty, reliability, self-discipline, and the desire to know (Favreau, P.29).

It is critical to stress that these ideas cannot be taught in classrooms alone. Current leaders in any arena should work to exemplify these attributes as they operate within their fire departments. The actual use of these qualities by people in positions of leadership, with the ability to influence their followers, will lead to an improved leadership posture. These are all fine ideas and ideals. But as Favreau (1973) reminds us, "ideas... remain ideas until, through a sustained leadership thrust, they are made real" (p. 30). Leadership requires the integration of support and concern for people with the requirement to consider the environment and tasks that need to be accomplished. A Fire Service Leadership Model must possess the following attributes:

- Knowledge of emergency operations.
- A list of tasks that must be accomplished.
- A concern for people.
- A thorough understanding of the mission(s) to be accomplished by operational forces.
- The ability to process information quickly and accurately.
- The ability to generate trust within the ranks of the people with whom the leader is working.
- The ability to intellectually stimulate those people to work towards the goals of the organization and the emergency operation.

This list is based on the leadership models discussed above.

## Conclusions

This paper has led to the conclusion that fire service leadership involves a combination of the attributes associated with many different leadership models that can be modified to fit the demands of the emergency

service role of the fire service. There is no simple, one-size-fits-all leadership model that fits the fire service. An analysis of the various models suggests, at least for the fire service, that while a leader must have an understanding of the tasks to be accomplished by his organization, it is more important to have an understanding of the people being led. The use of leadership in any life and death situation is neither simple, nor is it easy. My research, analysis and evaluation of the existing body of knowledge on leadership leads me to offer a model of leadership to current and future fire service leaders. The critical elements in providing fire service leadership involve the ability to generate loyalty, the ability to create an awareness of the role to be played by all team members, the ability to intellectually stimulate the team members, and a touch of charisma to catch the attention of team members. The attributes of the transformational and servant theories of leadership seem to provide the most promise for training fire service leaders for the unique challenges offered in the emergency service world.

No one is born into the role of a leader. Leaders can only be developed through a conscious effort that synthesizes the elements of training, reading, review, and practice, into a fervent desire to work with and for people. Future research in the area of coaching and mentoring could take the specific fire service leadership model presented in this paper to a higher level.

## References

- Autry, J. F. (2001). *The servant leader*. Roseville, CA: Prima Publishing.
- Barr, R. C., & Eversole, J. M. (2003). *The Fire Chief's Handbook* (6th ed.). Dallas: PennWell Books.
- Bass, B. M. (1985). Leadership: Good, better, best. *Organizational Dynamics*, 13, 26-40.
- Bass, B. M. (1990). From transactional to transformational leadership: Learning to share the vision. *Organizational Dynamics*, 18, 19-31.
- Bass, B. M. (1995). Concepts of leadership: The beginnings. In W. J. Thomas (Ed.), *The leader's companion* (pp. 49-52). New York: The Free Press.
- Bennis, W. & Thomas, R. (2002). Crucibles of leadership. *Harvard Business Review*, 80(9), 39-45.
- Brunacini, A. (2002). *Fire command* (2nd ed.). Quincy, MA: National Fire Protection Association.
- Burns, J. M. (1995). Leadership. In W. J. Thomas (Ed.), *The leader's companion* (p. 483). New York: The Free Press.
- Carter, H. R. (1998). *Fire fighting strategy and tactics*. Stillwater, OK: Fire Protection Publications.
- Carter, H. R., & Rausch, E. (1998). *Management in the fire service* (3rd ed.). Quincy, MA: National Fire Protection Association.
- Casimir, G. (2001). Combinative aspects of leadership style: The ordering and temporal spacing of leadership behaviors. *The Leadership Quarterly*, 12, 245-278.
- Clark, W. F. (1991). *Firefighting principles and practices*. Saddle Brook, NJ: Fire Engineering Texts.

- Coleman, R. J. (1978). *Management of fire service operations*. Duxbury, MA: Wadsworth Publishing Company.
- Compton, D., & Granito, J. (2003). *Managing fire and rescue services*. Washington, DC: International City/County Management Association.
- Compton, D. (1999). *When in doubt lead*. Stillwater, OK: Fire Protection Publications.
- Cotter, J. P. (1995). What leaders really do. In W. J. Thomas (Ed.), *The leader's companion* (pp. 114-123). New York: The Free Press.
- Cote, A. (2003). *Fire protection handbook* (19th ed.). Quincy, MA: National Fire Protection Association.
- Covey, S. R. (1989). *The 7 habits of highly effective people*. New York: Franklin Covey Company.
- Cronin, T. E. (1995). Leadership and democracy. In W. J. Thomas (Ed.), *The leader's companion* (pp. 303-309). New York: The Free Press.
- De Pree, M. (1989). *Leadership is an art*. New York: Dell Publishing.
- Dvir, T., Eden, D., Avolio, B. J., & Shamir, B. (2002). Impact of transformational leadership on follower development and performance: A field experiment. *Academy of Management Journal*, 45(4), 735-744.
- Gardner, J. W. (1995). The cry for leadership. In W. J. Thomas (Ed.), *The leader's companion* (pp. 3-7). New York: The Free Press.
- George, C. S. (1985). *Supervision in action: The Art of Managing Others* (4th ed.). Reston, VA: Reston Publishing Company.
- Hamm, R. (1990). *Leadership in the fire service*. Stillwater, OK: International Fire Service Training Association.
- Hayward, S. F. (1998). *Churchill on leadership*. Rocklin, CA: Prima Publishing.
- Hersey, P., & Blanchard, K. W. (1995). Situational leadership. In W. J. Thomas (Ed.), *The leader's companion* (pp. 207-211). New York: The Free Press.
- Howell, J. P. (1997). Substitutes for leadership: Their meaning and measurement--an historical assessment. *Leadership Quarterly*, 8, 113-116.
- Jenaway, W. F. and Gardiner, D. B. C. (1994). *Fire protection in the 21st century*. Ashland, MA: The Alliance for Fire and Emergency Management.
- Layman, L. (1955). *Attacking and extinguishing interior fires*. Boston: National Fire Protection Association.
- Lopes, B. F., III. (2003). Office management and workflow. In R.C. Barr & John M. Eversole (Eds.), *The fire chief's handbook* (6th ed) (pp. 13-40). Dallas: PennWell Books.
- Marinucci, R.A. (2003). In Robert C. Barr & John M. Eversole, *The fire chief's handbook* (6th ed.) (pp. 925-1112). Dallas: PennWell Books.
- Michael, S.R. (1976). Doing what comes naturally. *Management Review*, 65(11), 20-31.
- Nadler, D.A., & Tischman, M. L. (1995). Beyond the charismatic leader: Leadership and organizational change. In W. J. Thomas (Ed.), *The leader's companion* (pp. 108-113). New York: The Free Press.
- National Volunteer Fire Council. (1993). *Retention and recruitment in the volunteer fire service*. Emmitsburg, MD: United States Fire Administration.
- Paulsgrove, R. (2003). Fire department administration and operations. In Arthur Cote (Ed.), *Fire protection handbook* (19th ed.) (pp. 7-5 to 7-28). Quincy, MA: National Fire Protection Association.
- Peters, T. J., and Waterman, R. H., Jr. (1982). *In search of excellence*. New York: Warner Books.
- Rost, J. C. (1995). Leadership: A discussion about ethics. *Business Ethics Quarterly*, 5(1), 129-142.
- Schaeffer, L. D., (2002). The leadership journey. *Harvard Business Review*, 80(10), 42-47.
- Sternberg, R. J. (2003). WICS: A model of leadership in organizations. *Academy of Management Learning and Education*, 2, 386-401.
- Turner, N., Barling, J., Epitropaki, O., Butcher, V. and Milner, C. (2002). Transformational leadership and moral reasoning. *Journal of Applied Psychology*, 87, 304-311.
- Utecht, R.E., & Heier, W. D., (1976). The contingency model and successful military training. *Academy of Management Journal*, 19, 606-619.
- Von C. C. (1987). *On war*. New York: Penguin Publishing. (Original work published 1832)
- Von Schell, A. (1982). *Battle Leadership*. The Benning Herald, Ft. Benning, Georgia. Reprinted by the Marine Corps Association, Quantico, VA. (Original Work published 1933)
- Wren, J. T. (1995). *The leader's companion*. New York: The Free Press.
- Wofford, J. C., Whittington, J. L., & Goodwin, V. L. (2001). Follower motive patterns as situational moderators for transformational leadership effectiveness. *Journal of Managerial Issues*, 13, 196-211.
- Yusko, K. P., & Goldstein, H. W. (1997). Selecting and developing crisis-based leaders using competency-based simulations. *Journal of Contingencies and Crisis Management*, 5, 216-223.

### About the Author

**Dr. Harry R. Carter** is a municipal fire protection consultant, educator and motivational speaker based in Adelphia, New Jersey. He currently serves as Chairman of the Board of Fire Commissioners for Howell Township Fire District #2, and a long-time contributing editor for *Firehouse Magazine*, and the *Pennsylvania Fireman*. He also serves as the Editor-in-Chief for the Respondersafety.com highway safety website. A former President of the International Society of Fire Service Instructors, he enjoyed a 26-year career with the Newark, New Jersey Fire Department, serving as a Suppression Battalion Chief, Chief of Training, and Commander of the Hazardous Materials Response Team. He has also had a long career with the Adelphia Fire Company in Howell Township, NJ serving as Fire Chief and Training Officer. A veteran of 42 years in the fire and emergency service world, he holds degrees in organizational management, fire service administration, public policy analysis, fire safety administration, the social sciences and business administration. He has authored seven books and has written more than 1,400 magazine, web and journal articles. Dr. Carter can be contacted at [drharrycarter@optonline.net](mailto:drharrycarter@optonline.net).

## *Global Connections*

---

Editor's Note: In each issue of the *International Fire Service Journal of Leadership and Management (IFSJLM)*, one article from a recent issue of *Fire Safety, Technology, & Management (FST&M)* will be reprinted. In turn, an article from each issue of *IFSJLM* will appear in *FST&M*. *Fire Safety, Technology, & Management* serves as our sister journal in the United Kingdom and is published in association with The Fire Service College, Moreton-in-Marsh, England, and the Institution of Fire Engineers. We would like to thank Ms. Rosie Bennett, Managing Editor of *FST&M*, for her help in establishing this research cross-fertilization practice and for her support and advice in the establishment of *IFSJLM*.

We actively solicit articles on fire leadership and management from academicians and practitioners globally. We hope this section of the journal, aptly called "Global Connections," expands over the years as we build theory that impacts fire service leadership and management worldwide.

The article that follows by William Scaife and Jacqueline Lilly is reprinted as it appeared in *FST&M*. Like articles in *IFSJLM*, this article does not follow the American Psychological Association (APA) Style. *FST&M* uses the Harvard (author-date) Style.

---

**William J. Scaife and Dr. Jacqueline P. M. Lilly**

FireWorks Research Project, Anglia Ruskin University, Cambridge

### *Towards a Theoretical Model for the Evaluation of Equality and Diversity Initiatives*

#### *Abstract*

This paper reviews the published literature on the evaluation of equality and diversity initiatives within organizations and within the wider community and discusses the difficulties involved with the evaluation of such initiatives.

A survey of equality and diversity initiatives that was undertaken in a sample of the English Fire and Rescue Services is outlined. Evidence is presented that indicates the Fire and Rescue Services suffer similar difficulties with the evaluation of their initiatives.

The models that have been produced to evaluate training are reviewed briefly and are used to develop a general-purpose theoretical model that might be applied to measure and evaluate equality and diversity initiatives.

#### *Introduction*

Wentling (2000, p.435) commented that 'the changing workforce is one of the most extraordinary and significant challenges facing many organizations today.' Organizations now understand that diversity has emerged as a requirement for survival and success. Not only must organizations develop and implement initiatives that allow them to capture and retain diverse customer bases they must also recruit and retain a workforce that reflects that diversity (Florkowski, 1997; Wentling, 2000). As a result, many initiatives have been developed that are intended to manage diversity within organizations and within the wider community. Such initiatives have become a mainstream issue for both private businesses and public sector organizations (Jewson & Mason, 1994). However, some authors question the value of many of these equality and diversity initiatives as they perceive that frequently a lack of accurate measurement and evaluation has been undertaken (Comer & Soliman, 1996; Wentling, 2000; Hoque & Noon, 2004).

as specific activities, programmes, policies, and any other formal processes or efforts designed to promote organizational culture change related to diversity' (Wentling, 2000, p.436). Examples of such initiatives within organizations include; flexible working conditions; home working; education and training programmes on diversity; skill development for working in multicultural environments; career management programmes; mentoring schemes; informal support networks; and dependent care assistance (Arredondo, 1996). In general these initiatives are aimed at ethnicity and gender issues, although some encompass all individual differences and are directed at all employees (Wentling, 2000).

Initiatives to manage diversity within the wider community can range from limited programmes aimed at creating a positive image for an organization through to comprehensive initiatives aimed at local community revitalisation (Kubisch, Fulbright-Anderson & Connell, 1998; Baum, 2001; Hoque & Noon, 2004).

Within organizations diversity initiatives 'are defined

## *The case for evaluation*

The value of equality and diversity initiatives has been questioned widely. The increasing proportion of organizations that claim to have implemented equal opportunity or diversity policies has led to the suspicion that in reality these policies are exercises in image management and that unfair practices, prejudice and inequality persist. A charge sometimes levelled at formal equal opportunities (EO) policies is that they are not worth the paper they are written on' (Hoque & Noon, 2004, p.481). 'The argument, in short, is that many EO policies are "empty shells": they contain nothing of substance or value to the victims of discrimination' (Hoque & Noon, 2004, p.482). 'It is unknown whether these programmes are, in fact, producing expected gains, because so few organizations have evaluated their outcomes' (Comer & Soliman, 1996, p.473).

Two major surveys have shown that in the United Kingdom (UK) the cynicism about equality and diversity policies is not groundless. Industrial Relations Services (2001) discovered that some three-quarters of 208 companies surveyed had a disability policy. However, of the companies with a policy, only 40% monitored job applications by disability, only 25% consulted disabled employees and only 53% would allow time for treatment and rehabilitation. The Commission for Racial Equality (2000) concluded that over 90% of employees in the Scottish private sector were covered by policies on race, sex and disability. Unfortunately, less than half of those employers with these policies were able to demonstrate any practical steps that had been taken to put these policies into practice. EDSS (2005) noted that 41% of statutory sector funding requests to a Neighbourhood Renewal Fund had not reviewed their equal opportunities policies within the previous two years to take legislative changes into account.

There are therefore many reasons why equality and diversity policies need to be evaluated. The lack of attention to the evaluation of such initiatives has been reported regularly (Comer & Soliman, 1996; Wentling, 2000). This lack of attention to evaluation has been blamed on an apparent lack of appropriate measures. There is therefore an urgent need for practitioners and researchers to include suitable evaluation measures within an initiatives development cycle (Comer & Soliman, 1996).

## *The evaluation process*

At its best, evaluation helps those with interests in programs – planners, implementors, funders, potential beneficiaries, or opponents, for example – understand what difference the programs have made (or could make) in the world: whether, to begin, they have made any difference; whether the difference is what was intended; whether any difference that resulted was desirable; why the programs did whatever they did; whether the intended result, accomplished or not, was reasonable; what, if anything, it would be reasonable for programs

to aim for in the future; and what strategies and conditions would make attempts more successful than not' (Baum, 2001, p.147).

In spite of the difficulty of determining the impact of equality and diversity initiatives, some organizations are making efforts to measure their value and the measurement of cost and return on investment is becoming important (Wentling, 2000). Usable measures are becoming available for the evaluation of internal initiatives and a number of recognised formal techniques have been adapted for the measurement of diversity training (Wentling, 2000; Clements & Jones, 2002). Techniques are being developed for the evaluation of initiatives that impact the wider community although the accuracy and value of these remains open to question (Kubisch et al., 1998; Baum, 2001).

In the UK public sector, the evaluation of projects, particularly those with a large capital budget, has become a requirement of both central government and other funding bodies. The Department of Health (2002, p.2) developed a good practice guide for post-project evaluation 'to ensure maximum pay-off from evaluation.' The guide recommended that organizations:

- 'View the evaluation as an integral part of the project and plan for it at the outset. ---- The evaluation should be costed and resourced as part of the project.
- Secure commitment from senior managers within the organization.
- Involve all key stakeholders in its planning and execution.
- Develop relevant criteria and indicators to assess project outcomes from the outset of the project.
- Put in place mechanisms to enable monitoring and measurement of progress.
- Foster a learning environment to ensure lessons are heeded.' (Department of Health, 2002, p.2)

The Leicester Equality and Diversity Partnership (LEDP) has introduced an Equality and Diversity Toolkit to ensure that equality and diversity issues are integral to both the project funding process and the project itself (EDSS, 2005). The toolkit addressed the six equality areas that are either existing within current legislation or will be subject to legislation in the near future: age, disability, gender, faith and beliefs, race and sexuality. The toolkit 'was designed to provide Collaborative Groups and the submitting organizations with a framework that would demonstrate active engagement with equality and diversity issues. This could then be monitored and evaluated over the lifetime of the projects' (EDSS, 2005, p.4). An advantage of this approach is that the base position is identified at the funding stage of a project. With suitable criteria, it should be possible to measure and evaluate the progress and outcomes of the project.

### *Evaluating diversity initiatives within organizations*

Wentling (2000) undertook a study of the diversity initiatives of eight major multinational corporations. Of these, six had processes in place to evaluate the initiatives. The range of evaluation methods numbered three to seven with an average of 4.8 per organization (Wentling, 2000) (see Table 1).

Corporations that tracked employee data indicated that they reviewed turnover rates, retention, hiring and promotion of women and minorities. In addition, employment data was reviewed to determine the representation of diverse groups at all organizational levels with particular interest taken in the representation at top management levels (Wentling, 2000).

'in a manner that reflects the needs of employers rather than the needs of the social group in general. A further cause for concern relates to the scope for line managers to exercise discretion in terms of the operationalization of EO practices'.

Perhaps most importantly, Wentling (2000) noted that all participants used representation of diverse populations at all levels of the organization as a measure of success.

### *Diversity initiatives within the wider community*

The research that has been undertaken and the evidence that has been presented indicated that initiatives within the wider community have been, and remain,

**Table 1 Methods for evaluating diversity (n=8) presented by rank order.**

	Method	f	%
1	Employee surveys	6	75
2	Track employment data	6	75
3	Management annual performance reviews	4	50
4	360-degree feedback	4	50
5	Focus groups	3	38
6	Benchmarking	3	38
7	Diversity-specific surveys	3	38
8	Customer feedback	3	38
9	Informal employee feedback	2	25
10	Informal employee group feedback	2	25
11	Employee attitude surveys	1	13
12	Peer reviews	1	13

Multiple responses were accepted. (Wentling, 2000, p.441)

Management annual performance reviews and 360-degree feedback processes were used to determine if a particular manager was using his/her skills in dealing with diversity issues and if the manager's unit was improving in effectiveness and profitability through the use of a more diverse workforce. The information gained by these methods was fed back to better develop managers in the skills required for dealing with diversity issues (Wentling, 2000).

Wentling (2000) considered that benchmarking was important in that it enabled the corporations to assess their progress in comparison with other companies. Customer feedback was used to determine if the customers' needs were being met. Whilst this was used primarily to evaluate the company's products and services, it did provide information on the customers' perceptions of diversity issues. Wentling (2000, p.443) does not indicate precisely how these high level objectives are measured instead stating 'if they achieve their goals, then they could conclude that the diversity initiatives were successful.' Hoque and Noon (2004, p.484) raise doubts about this approach stating that 'the initiatives become targeted' on a particular group

difficult to evaluate (Shaw, 1996; Kubisch et al., 1998; Baum, 2001). Connell and Kubisch (1998, p.23) note that 'experience from a wide range of programmes' has indicated that 'identifying and agreeing upon long-term outcomes is relatively easy, in part because long-term outcomes are generally so broad as to be uncontroversial'. 'Likewise, identifying early activities is relatively straightforward. Intermediate and early outcomes are more difficult to specify because scientific and experiential knowledge about links between early, interim, and long-term outcomes is not well developed' (Connell & Kubisch, 1998, p.23).

Connell and Kubisch (1998, p.15) suggested a 'theory of change approach' to evaluating initiatives within the community. This approach requires three steps: articulating a theory of change; measuring an initiative's activities and intended outcomes; and analysing and interpreting the results of an evaluation, including the implications for adjusting the initiative's theory of change and its allocation of resources. Put simply, a theory of change is a theory of how and why an initiative works (Weiss, 1995).

Connell and Kubisch (1998, p.19) 'have identified three attributes of a good theory of change that stakeholders should confirm are present before committing to an evaluation and, indeed, should revisit throughout the implementation and evaluation of the initiative:

*It should be plausible.* Do evidence and common sense suggest that the activities, if implemented, will lead to desired outcomes?

*It should be doable.* Will the economic, technical, political, institutional, and human resources be available to carry out the initiative?

*It should be testable.* Is the theory of change specific and complete enough for an evaluator to track its progress in credible and useful ways?'

Connell & Kubisch (1998, p.40) suggested subsequently that a fourth criterion be added: 'outcomes included in the theory of change be *meaningful* to all stakeholders.'

To develop an initiative with these attributes, stakeholders need to draw upon various sources of information, the most important being scientifically generated knowledge, programme experience and community residents' insights (Connell & Kubisch, 1998). O'Connor (1995) emphasised that the status of the external environment must be incorporated into the development of the theory of change. Careful consideration needs to be given to factors that might have an impact on the initiative's chances of success that the initiative itself is not able to influence.

In the process of developing a good theory of change, Connell and Kubisch (1998) suggest that the stakeholders work backwards from the long-term outcomes to initial activities and resource mapping (see Figure 1). This process is intended to identify and agree the outcomes and activities required to complete the initiative and the evaluation and measurements techniques to be used. The agreed activities and outcomes are then expanded into a matrix chart representing the steps and appropriate responsibilities.

Under a theory of change approach, the measurement of activities is as important as the measurement of the outcomes. 'To make a case for impact, the theory of change approach seeks to accumulate rigorous

tests of links between an initiative's activities and their expected outcomes. Therefore, it must have compelling measures of both activities and outcomes and then link, through causal inference, change in one to change in the other, repeatedly and cumulatively over the early, intermediate, and later stages of the initiative' (Connell & Kubisch, 1998, p.32).

Baum (2001) had reservations about the theory of change approach and believed that practical constraints limit what could be measured and evaluated. 'Even if participants were certain about what interventions should accomplish and how they should produce specific effects, it would be impossible to observe everything that should bear on evaluating an initiative. Finite budgets limit observations to short time periods and narrow physical and social spaces. Long-term outcomes are difficult to identify because they require that evaluators stay in the field a long time and observe an ever-widening array of influences on the objects of the initiative' (Baum, 2001, p.159). Observation, whilst undertaken with care, is liable to be opportunistic and should focus on what really matters and what is accessible. Creativity in data collection is crucial and researchers should remember that 'participants have rich knowledge of the details of their interventions that can be used to evaluate initiatives' (Baum, 2001, p.159).

### *Equality and diversity initiatives within the Fire and Rescue Services*

Early in 2005 a survey was undertaken of equality and diversity initiatives in the English Fire and Rescue Services (FRS). The survey was prepared by the FireWorks Research Team at Anglia Ruskin University and submitted to a sample of the FRS with the support and assistance of the Chief Fire Officers Association (CFOA). Of 15 FRS approached to take part in the survey, some 14 responded.

The FRS were asked to detail the initiatives they had undertaken in the period between 1st January 2004 and 28th February 2005 and those that they intended to undertake between 1st March 2005 and 31st August 2005. The FRS were asked to place their initiatives in the categories of recruitment, promotion and retention of women and of black minority ethnic (BME) and to comment on the success or otherwise of those initiatives that had been undertaken.

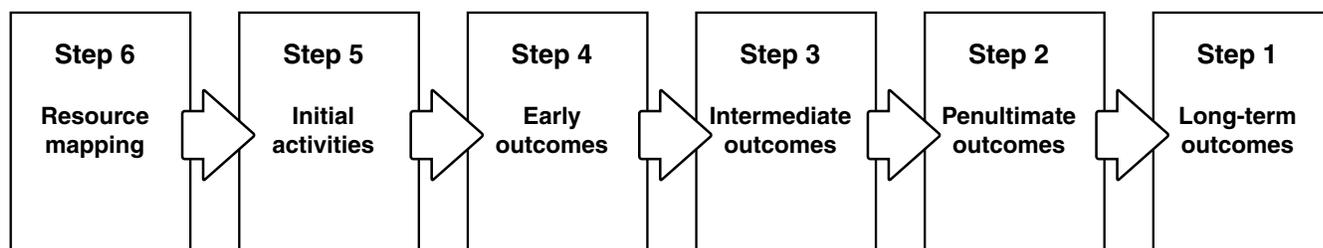


Figure 1. Steps in developing a good theory of change. (Connell & Kubisch, 1998. P.22)

The numbers of responses by FRS are detailed in Table 2 and the initiatives are grouped by type in Table 3.

In the survey, respondents were asked specifically to indicate the success of their initiatives on a five-point scale where 1 represented no success and 5 represented outstanding success. However, a majority of respondents expanded on the scoring system with written comments. These comments indicated that the definition of success was often taken from a subjective view point as there was little firm evidence available. A sample of such comments is provided in Table 4.

The issue of uncertainty in the evaluation of success was best described by one respondent who noted in a covering letter:

'I hope you find the above information helpful. Considering the initiatives highlighted it appears to me

that we need a comprehensive monitoring system put in place so to be able to judge our successes and failures more objectively.'

### Evaluating Diversity Training

Whilst there is a lack of published general models to evaluate equality and diversity initiatives, some educational specialists have developed models specifically intended to evaluate training. Of these, the three principle models were developed in the 1970s by Kirkpatrick, Hamblin and Warr, and Bird and Rackham. Recently however these models have been considered to be inadequate and Kirkpatrick's model has been extended by Phillips to quantify the benefits of training in terms of cost. In addition, Kearns developed a significantly more comprehensive ten-point added value evaluation model. Unfortunately, this model developed by Kearns is considered to be complex, time consuming and expensive

**Table 2 Number of initiatives recorded by each Fire and Rescue Service (N=14)**

Type of Initiative	Number of Initiatives Recorded on Survey				
	0	1	2 to 5	6 to 10	11 or more
Women Recruitment	2	2	9	0	1
Women Promotion	7	3	4	0	0
Women Retention	6	3	5	0	0
BME Recruitment	3	1	9	0	1
BME Promotion	8	4	2	0	0
BME Retention	7	4	3	0	0

**Table 3 Type and details of initiative by Fire and Rescue Service (N=14)**

Type of initiative	Details of Initiative	Number of Fire and Rescue Services	
		Undertaken 1/1/2004 to 28/2/2005	Planned 1/3/2005 to 31/8/2005
Women Recruitment	Open days, positive action workshops and awareness days.	10	7
	Networking with community groups.	2	1
	Young fire-fighters scheme.	1	2
	Recruitment fairs, graduate recruitment days and career events.	5	4
	Schools and colleges liaison/talks.	2	2
	Positive action event aimed at young adults.	1	0
	Targeted press adverts.	2	1
	Targeted radio coverage/adverts.	2	1
	Sport sponsorship.	1	1
	Drama training for managers.	0	1
	Leaflet drops by postal services.	1	1
Posters/leaflets/etc at shops, businesses and Connexions and Job Centres.	1	1	
Women Promotion	Internal Women's Support Group.	1	1
	Use external Women's Support Groups (eg. NWFS)	2	2
	Mentoring scheme.	3	3
	Encourage promotion through IPDS scheme.	4	4
	Assignment to HQ as temporary crew manager.	1	1

**Table 3 Type and details of initiative by Fire and Rescue Service (N=14)**

Type of initiative	Details of Initiative	Number of Fire and Rescue Services	
Women Retention	Internal Women's Support Group.	0	1
	Use external Women's Support Groups (eg. NWFS)	0	2
	Equality and diversity training/seminars.	4	5
	Policy and/or survey on bullying and harassment	1	2
	Equality survey of women.	0	1
	Uniform Service Course jointly held with the police.	0	1
	Exit interview programme.	1	1
	Direct communication channel.	1	1
	Plan child care facilities.	0	1
BME Recruitment	Open days, positive action workshops and awareness days.	3	5
	Networking with community groups.	6	6
	Young fire-fighters scheme.	0	2
	Recruitment fairs, graduate recruitment days and career events.	2	3
	Schools and colleges liaison/talks.	3	3
	Positive action event aimed at young adults.	1	1
	Targeted press adverts.	3	3
	Targeted radio coverage/adverts.	1	2
	Drama training for managers.	0	1
	Sport sponsorship.	1	2
	Leaflet drops by postal services.	2	1
	Posters/leaflets/etc at shops, businesses and Connexions and Job Centres.	1	1
BME Promotion	Mentoring scheme.	1	2
	Encourage promotion through IPDS scheme.	5	5
	Assignment to HQ as temporary crew manager.	1	1
BME Retention	Equality and diversity training/seminars.	3	4
	Policy and/or survey on bullying and harassment	1	2
	Uniform Service Course jointly held with the police.	0	1
	Exit interview programme.	1	1
	Plan to assist trainees finish initial course.	1	1
	Established fire-fighter assigned to assist trainees.	1	1
	Plan child care facilities.	0	1

**Table 4 Written comments on the evaluation of initiatives**

Initiative	Comment
Sport sponsorship	Success unknown as generally lacking on the evaluation side, no tracking mechanism.
Station open days	Success tends to be unknown as the details of the numbers attending tend to stay with the watch/station manager.
Leaflet drops	Whether this is cost effective or works is still under discussion.
Exit interviews	No particular feedback available but thought to be potentially valuable.
Equalities and diversity training	Success not known.
Sport sponsorship	No specific statistics to link to recruitment, but a wide range of teams from the local BME community took part.
Leaflet drop by post-code	I am told that this initiative appears to have been quite successful; unfortunately I do not have further information in relation to progression through the recruitment process.
Women's positive action event	This event appeared not to have been successful.
Targeted advert	Unfortunately we are not sure how successful this initiative was.
Initiative	Comment

**Table 4 Written comments on the evaluation of initiatives**

<b>Graduate recruitment fair</b>	This was considered to be unsuccessful as no whole-time vacancies were available and no record was taken on the numbers attending the Fire Service promotion.
<b>Positive action day</b>	Success unknown as numbers of attendees not recorded and no evaluation sheets distributed.
<b>Poster campaign</b>	Not aware that there has been a specific response to these posters.
<b>Community networking</b>	No information on success but believed of use.
<b>Communication channel</b>	Success not known but again shows female fire-fighters that advice and assistance is available.

to implement (Clements & Jones, 2002). In recognition of this, the FireWorks team developed a toolkit specifically for the evaluation of equality and diversity training.

### *A General Purpose Evaluation Model*

Of the models developed to evaluate training, Kirkpatrick's four level model remains the most widely used in current practice. Hamblin's and Phillips' improved on Kilpatrick's model by the inclusion of the additional level intended to measure, in financial terms, the results and costs of the training programme (Clements & Jones, 2002). Unfortunately, all of these three models assume that the training to be evaluated is necessary. The Warr, Bird and Rackham and the Kearns models include a stage that questions the requirement of the training but both exclude any form of financial measurement (Clements & Jones, 2002).

As such, none of these models is suitable for use as a general-purpose model that can be used in evaluation of equality and diversity initiatives. However, the FireWorks research would suggest that a suitable general-purpose model can be developed from the best features of these five models (see Table 5).

### *Conclusions*

Most organizations have diversity and/or equality policies. Unfortunately, the evidence indicates that in many cases such policies are poorly defined, not rigorously enforced or out of date. The success or otherwise of any initiatives that are undertaken as a result of these policies is frequently unknown as monitoring, measurement and evaluation can be inadequate or absent.

The evidence obtained by the survey of a sample from the English Fire and Rescue Services confirms this view. If available, a simple model able to assist with the evaluation of equality and diversity initiatives would appear to be welcome.

There are a number of theoretical techniques available for measuring and evaluating training initiatives within organizations. Whilst these techniques are widely used, they lack the scope required for use as general equality and diversity measurement tools. The FireWorks model for evaluating Diversity Initiatives is currently being piloted and it is anticipated that it will overcome these deficiencies without becoming overly complex.

A complete rationale for the development of the model, and suggestions for its use within the English FRS, was published in the FireWorks final project report (Lilly, 2005). The toolkit is available on the project website at [www.anglia.ac.uk/fireworks](http://www.anglia.ac.uk/fireworks)

**Table 5 Initiative evaluation model suggested by the FireWorks Team (developed from the models of Kirkpatrick, Hamblin, Phillip, Warr, Bird and Rackham and Kearns)**

<b>Level 1 Reaction and planned action</b>	This level is conducted before, during, immediately after and some time after the initiative. It outlines the requirements and the objectives of an initiative, specific plans for implementation of the initiative and attempts to define and measure the participant's reactions to the initiative.
<b>Level 2 Learning</b>	Measures the extent to which participants have acquired new skills, knowledge and understanding and identifies behaviour or attitude changes.
<b>Level 3 Job application and behaviour</b>	Measures application of the initiative to change in workplace performance and organization behaviour.
<b>Level 4 Business results</b>	Quantifies any improvement to the organization and measures business impact of the initiative.
<b>Level 5 Ultimate Value</b>	Measures the monetary values of the results and costs of the programme usually expressed as Return on Investment (ROI).

## References

- Arredondo, P. (1996) *Successful Diversity Management Initiatives: A Blueprint for Planning and Implementation*, Thousand Oaks, California: Sage.
- Baum, H. S. (2001) 'How should we evaluate community initiatives?', *Journal of the American Planning Association*, 67(2), pp.147-166.
- Clements, P. and Jones, J. (2002) *The Diversity Training Handbook*, London: Kogan Page Limited.
- Comer, D. R. and Soliman, C. E. (1996) 'Organizational efforts to manage diversity: do they really work?', *Journal of Management Issues*, 7(4), pp.470-483.
- Commission for Racial Equality (2000) *Equal Opportunities and Private Sector Employment in Scotland*, Edinburgh: Commission for Racial Equality.
- Connell, J. P. and Kubisch, A. C. (1998) 'Applying a theory of change approach to the evaluation of comprehensive community initiatives: progress, prospects, and problems', in Fulbright-Anderson, K., Kubisch, A. C. and Connell, J. P. (eds.) *New Approaches to Evaluating Community Initiatives: Volume 2 Theory, Measurement and Analysis*, Washington, District of Columbia: The Aspen Institute.
- Department of Health (2002) *Good Practice Guide: Learning Lessons from Post-Project Evaluation*, London: Department of Health.
- EDSS (2005) *Equality & Diversity and NRF Projects: Report on the Analysis of Equality & Diversity Toolkits Completed by NRF Projects as part of the NRF Appraisal Process – Abridged Version*, 5-9 Upper Brown Street, Leicester: Equality & Diversity Support Service.
- Florkowski, G. W. (1997) 'Managing diversity within multinational firms for competitive advantage', in Kossek, E. E. and Lobel, S. A. (eds.) *Managing Diversity: Human Resource Strategies for Transforming the Workplace*, Oxford: Blackwell.
- Hoque, K. and Noon, M. (2004) 'Equal opportunities policy and practice in Britain: evaluating the "empty shell" hypothesis', *Work, Employment and Society*, 18(4), pp.481-506.
- Industrial Relations Services (2001) 'Managing disability at work', *IRS Employment Review*, 738, pp.7-13.
- Jewson, N. and Mason, D. (1994) 'Race, employment and equal opportunities: towards a political economy and an agenda for the 1990s', *Sociological Review*, 42(4), pp.591-617.
- Kubisch, A. C., Fulbright-Anderson, K. and Connell, J. P. (1998) 'Evaluating community initiatives: a progress report', in Fulbright-Anderson, K., Kubisch, A. C. and Connell, J. P. (eds.) *New Approaches to Evaluating Community Initiatives: Volume 2 Theory, Measurement and Analysis*, Washington, District of Columbia: The Aspen Institute.
- Lilly, J. (2005) (ed.), *FireWorks: for equality in the fire service*, Project Report-December 2005, Anglia Ruskin University, .
- O'Connor, A. (1995) 'Evaluating comprehensive community initiatives: a view from history', in Connell, J. P., Kubisch, A. C., Schorr, L. B. and Weiss, C. H. (eds.) *New Approaches to Evaluating Community Initiatives, Concepts, Methods, and Contexts*, Washington, District of Columbia: The Aspen Institute.
- Shaw, I. (1996) *Evaluating in Practice*. Aldershot, Hants: Arena, Ashgate Publishing Ltd.
- Weiss, C. H. (1995) 'Nothing as practical as good theory: exploring theory-based evaluation for comprehensive community initiatives for children and families', in Connell, J. P., Kubisch, A. C., Schorr, L. B. and Weiss, C. H. (eds.) *New Approaches to Evaluating Community Initiatives, Concepts, Methods, and Contexts*, Washington, District of Columbia: The Aspen Institute.
- Wentling, R. M. (2000) 'Evaluation of diversity initiatives in multinational corporations', *Human Resource Development International*, 3(4), pp.435-450.

## About the Authors

**Bill Scaife** started his career in the computer services industry where he held a number of management positions finishing as European Call Centre Manager for a major Japanese manufacturer of computer products. On leaving industry, Bill joined Anglia Polytechnic University (now renamed as Anglia Ruskin University) to undertake a Ph.D. on the application of evolutionary theories from the natural sciences to organisations in the manufacturing sector. He has been involved with a number of research projects for the University, including support provided for inventors, design processes in small and medium enterprises, learning and development in the voluntary sector and issues with equality and diversity within the UK Fire and Rescue services. Bill serves as corresponding author and can be contacted at: [w.scaife@anglia.ac.uk](mailto:w.scaife@anglia.ac.uk).

**Dr. Jaki Lilly** is an experienced researcher, a qualified teacher and has worked in commercial, educational and public service fields. As a research fellow in Anglia Ruskin University's Centre for Learning and Teaching (UCLT) in Cambridge, England, Jaki undertakes externally funded research and leads UCLT research into doctoral learning and support. She also contributes to training programmes for doctoral students and their supervisors across the University and supports the research of members of staff. Jaki has worked on a range of funded research projects. Most recently she directed the research for a large European Social Fund (ESF)/Anglia Ruskin funded project investigating the barriers to recruitment, retention and promotion of women and people from minority ethnic backgrounds in the English Fire and Rescue Service. This paper is one of four reflecting the findings – the others can be found in the final project report on the project website at: [www.anglia.ac.uk/fireworks](http://www.anglia.ac.uk/fireworks).

## Book Reviews

### Review of:

Van Wart, M. (1998). *Changing public sector values*. New York: Garland Publishing. 328 pp. (\$38.95 paperback).

Quinn, R. E. (1988). *Beyond rational management: Mastering the paradoxes and competing demands of high performance*. San Francisco: Jossey-Bass Publishers. 224 pp. (\$34.00 paperback).

Applying managerial practices to the fire service is a relatively new idea. With the creation of graduate degree programs in fire administration and the popularity of the National Fire Academy's Executive Fire Officer Program, the profession has begun to realize the benefits of ensuring that its leaders possess the necessary administrative skills to direct the nation's fire departments.

Unfortunately, this was not always the case. For years, fire departments operated in a leadership vacuum. This is not to say that the service did not have its share of competent leadership. Rather, chief fire officers merely lacked the formal education to efficiently run an organization. Moreover, the culture of the profession even questioned the education of fire personnel, chiefs included. Fortunately, through the efforts of the Wingspread Conferences, for example, this attitude has changed and the profession now recognizes the need for educated leaders.

The following books represent just two of many in the field of management. Both are well written and informative. This reviewer's aim will be to test the application of each author's thesis relative to the fire service.

Montgomery Van Wart's incisive work investigates public sector values and perhaps more important, the concept of ethics. He builds upon Ernest Greenwood's (1957, pp. 44-55) attributes for an ideal profession, which are:

- A systematic body of knowledge—conducting research to advance it and have a high degree of conceptual mastery
- A professional culture<sup>1</sup> -- promoting extended schooling and professional apprenticeships
- The sanction of the community—maintaining continuity and discipline through external and internal controls
- A regulative code of ethics—adhering to professional code of ethics
- Substantial professional authority—requiring extensive training sanctioned by the community and self-regulation.

For the record, Van Wart sees firefighters as possessing strong professional identities.

The author identifies five value sources that influence an administrator's decision-making strategy. They are: individual values, professional values, organizational values, legal values, and public interest values. These are additionally broken down into basic assumptions that assist managers in their decision making. For the sake of brevity, this review will only address professional values in light of their relationship to the fire service.

There are three assumptions within the framework of professional values that public administrators (fire chiefs included) should consider. All are paramount to the greater good of fire departments. Initially, they should be well trained, including "extensive professional education." Second, they should be influenced by the "expertise and wisdom" of the profession via professional traditions, standards, and continuing education requirements. Third, they must encourage professional values in public organizations, "such as independence in technical decision making and a competitive income."

The first assumption is the most important, that is, the charge of educating fire service leaders. As mentioned above, professional education for fire chiefs is a relatively new concept. There are only about six colleges and universities that grant graduate degrees in some aspect of fire administration/management. No doubt Van Wart would endorse more programs.

The second assumption juxtaposes neatly with the fire service. Tradition has long been the hallmark of the profession. Standards also have become deep-rooted in the discipline. Even continuing education is now commonplace. Where the profession is deficient is in its "expertise and wisdom." The unfortunate state of affairs in the fire service is plainly the lack of scientific research. Numerous publications in fire studies are based more on experience and consensus rather than scientific research. Until leaders of the fire service demand that the discipline be held accountable to the same rigorous academic standards as other disciplines, such as public administration for example, fire service professionalism will be challenged. Hence the value of Van Wart's research becomes apparent.

Independence in technical decision making has long been a practice in the fire service. From constant revisions of pre-fire planning, and upgrading standard operating procedures, to ensuring the implementation of various fire prevention codes and standards, fire officials have been proactive. Competitive income may be another matter.

When weighed against chief operating officers/chief financial officers (COO/CFO) in the business environment, fire chiefs seldom reach parity. Examine COO/CFO's with the same number of employees and comparable total budgets and one will find the compensation package of a private sector manager to be greater than that provided a fire chief. The plain fact is that a chief's

average salary in the United States is not comparable to those in the private sector.

Robert Quinn's thesis in *Beyond Rational Management* is really quite fundamental. He argues that "master managers," as he calls them, must develop the capacity to employ contradictory perspectives; that is, a manager should be capable of pursuing two or more opposing managerial philosophies at the same time. This is something, according to the author, that is seldom practiced. When one can become skilled at this paradox, excellence will be created in the workplace. It is, of course, this journey from novice to master that is the nucleus of the book.

"Master managers" cannot craft quality performance from their staff by adhering to one or even two philosophies. This, he writes, is the problem of managers today. For example, historically, managerial ideas such as McGregor's (1960) Theory X and Y, were part of a purposive either/or proposition.<sup>2</sup> The traditionally forced selection of either one or the other, argues Quinn, limits and hinders managers (fire chiefs included) in their relationship with their employees. The quandary is that purposive thinking often discourages one from seeing certain cues and employing frames. It oversimplifies and distorts reality. Successful leaders, he writes, must learn to simultaneously juggle several different principles.

People who aspire to become "master managers" cannot look at their work environment only in a structured analytic way. Instead, they must develop the capacity, to see it as a complex, dynamic system, which is constantly evolving. Because of these shifts, masters of management may appear to act in paradoxical ways as they successfully engage the contradictions of organizational life by using contradictory frames. One of the theses of the book is that managers can make the journey from novice to master. In doing so, they must undergo several profound changes.

Moving beyond rational management means moving from the purposive (either/or approach) to a more holistic (inclusive) approach. The key point is to understand the difference between the two. The purposive scheme forces one to choose only a single approach. The holistic approach, on the other hand, allows for simultaneously utilizing several ideas. The essential lesson to be learned is that although the purposive frame excludes the holistic, the holistic includes the purposive. Hence, it is possible to be both holistic and purposive.

So, how does Quinn's thesis lend itself to the fire ser-

vice? Like Van Wart, Quinn sees that fire departments are no different from other organizations. Fire chiefs can become "master managers" providing they avoid purposive thinking, which would undoubtedly represent a radical break from "fire's" culture. It has been my experience that chief fire officers seldom think outside the box. Tradition and experience taught them to think and act one way. There was no middle ground. What both Quinn and Van Wart provide for those in the fire service is a way to look at managing in a different light, to realize that contradictions of organizational life exist in the fire service and better the chief who recognizes new approaches.

If the fire service is to gain parity with other professions, it will require researched scholarship specific to the discipline. Until such research becomes commonplace, future chiefs will be compelled to learn from authors outside the profession. This is not a bad venture as exemplified by the two books discussed above. Hopefully, in the not too distant future, the fire service will produce its own body of literature specifically aimed at the fire service and authored by fire service personnel.

**John M. Moschella, EFO**  
Anna Maria College

### *Notes*

<sup>1</sup>Van Wart defines culture as a group's social values and basic beliefs that are the unquestioned premises upon which its very existence rests.

<sup>2</sup>Theory X assumes that people are only interested in security and have little ambition or desire for responsibility. Contrarily, Theory Y assumes that people are willing to exercise self-direction and self-control in the pursuit of goals to which they are committed and for which they are rewarded.

### *References*

- Greenwood, Ernest. (1957). Attributes of a profession. *Social Work*, 2(3), 44-55.
- McGregor, Douglas. (1960). . New York: McGraw-Hill.

*Review of:*

Collins, J. (2001). *Good to great. Why some companies make the leap...and others don't*. New York: Harper-Collins. 320 pp. (\$27.50 hardcover).

Over the years, many books have claimed to identify and provide secret recipes for enabling organizations to be a cut above the rest...the so-called "in search of excellence" ones. Best in class, high-performing, and Baldrige Award winners are additional descriptors that writers have used to distinguish organizations at this level. *Good to Great* seems to have at least captured the attention of those interested in learning this recipe; it was a best seller for many months. But is this possible? Jim Collins and his research team from the University of Colorado claim that very few companies have achieved a level of greatness, at least measured in terms of financial success, over an extended period of time. The book does offer some insights, but also leaves the reader with at least a few questions, particularly for those who operate daily in the public and not-for-profit sectors.

The essential claim of Collins is that good is the enemy of great; that companies, like individuals, become very satisfied with normalcy; and that it is possible to identify and apply some distinguishing factors of those entities that have distinguished themselves and outperformed their competitors. These are "the great" companies spotlighted in his work. His research identified three stages (all based on discipline) necessary for a company to go from good to great, and each step allegedly contains requisite behavior and activity to support the correlative element. I might add, the term "company" is very purposeful and while it may be implied that these concepts can be applied to any organization, Collins limits his direct applications mostly to "for-profit" companies. In fact, the eleven companies finally chosen after exhaustive winnowing were based on financial indicators of having significantly outperformed their competitors and the entire publicly traded market. Some of the eleven included Abbott, Circuit City, Gillette, Kroger, Philip Morris, and Walgreens. In discussing his identified stages and steps, Collins frequently refers to individuals from history such as Abraham Lincoln, Winston Churchill, and Admiral Jim Stockdale to reinforce his points and compare them to the authority figures cited from the eleven firms and their competitors.

Collins's research identified that there was no single action or incident that dramatically changed or transformed a good company to a great one. He refers to this finding as "the flywheel concept," a metaphor that describes the steady, progressive effect of building capacity and increasing revenue with market share over time. He claims that the great companies demonstrated purposeful, disciplined, and repetitive resolve to their people, thought, and actions. However, Collins does claim that there came a point, as witnessed in the history of his study group, where there was a marked

transition point. The transition point, called the "black-box," marked the time when good companies become great ones.

Collins claims that the black box contents are timeless principles, such as having "the right people, not just anyone," being best at your core business, demonstrating self-discipline over extended periods of time, and carefully selecting and employing technology as components of your self-imposed rigor. The author also weaves an examination of the authority figures or chief executive officers of both the eleven companies and their competitors. He claims that each of the senior officials in these great companies exhibited "Level Five Leadership," a term that characterizes ambition first for the company and concern for its success, fierce resolve, and personal humility. The author had earlier introduced his leadership hierarchy with the implication that very few authority figures reach the top level. I was not surprised when Collins admitted that there was no research to support a credible list of "how to become a Level Five," and to suggest such would have weakened his overall findings and perspectives.

It was in this area that I think Collins offers the most for public sector officials. Through the use of stories, including those of Lincoln, Churchill, Stockdale and others, he provides insights on exercising leadership. For example, he relives Stockdale's imprisonment as a POW in Vietnam, and reminds the reader of how the Admiral never allowed his faith that they would prevail to be confused with his ability to confront the brutal facts of the (current reality) day. The application here is to reinforce what Collins has introduced as a key element of Level Five Leadership: fierce resolve, self-discipline over time, and humility.

One of the areas that I had the most difficulty with Collins was the process and treatment of distinguishing the eleven companies. For example, Philip Morris was recognized by Collins as "even with a most sinful collection of consumer products (to include cigarettes), we found tremendous passion for the business." He further quotes a Vice Chairman of Philip Morris in 1979 as having stated, "I love cigarettes. It's one of the things that makes life really worth living." Collins acknowledges that it was this kind of passion that made Philip Morris a great company. However, Collins fails to probe deeper by asking and responding to the necessary elements that form the basis of organizational morality, such as do we only measure the greatness of even a private sector company based on financial outcomes and stockholder performance? Or is there something else that should have been included in determining whether a company, organization, or group is good, great, or not? Do the ends justify the means? These are important questions that all officials should grapple with regarding the services and products they provide to the public. I found Collins' failure to entertain this discussion with the reader to be a factor that weakened the overall work.

Collins' premise is that the good companies become great ones over an extended period of time. But his position is not held by everyone. With so much appearing in the contemporary literature regarding change, one challenging position is that organizations are vaulted forward because of some external, environmental trigger. Collins claims that these triggers are short-lived, and while they may feature momentary success for any organization, if there is a lack of focus, resolve, discipline, and not having the right people, it will be short lived. He reminds the reader that Sam Walton began his enterprise in 1945 with a single dime store. He claims that it took 15-20 years for Wal-Mart to grow to its transition point...when the growth of the company exploded to over 3,000 stores with market revenues of over \$150 billion.

And it is this point that leaves me with an overall positive feeling regarding *Good to Great*. Collins suggests that organizations should develop a culture of "Clock

Building vs. Time Telling." The great organizations, the clock-builders, will endure and adapt. They will not be dependent on a single official, manager, or executive, nor will they survive based on a single great idea. The greatness will be attributed to the organization's culture, sustained and nurtured by groups of people exercising leadership.

*Good to Great* is a worthy read, but don't expect to find all of the answers here. Its greatest contribution is reinforcement to those who are attempting to exercise leadership that any measure of great success is at least partially attributed to steadfast resolve, organizational discipline, service to others with personal humility, and hard work. We all can benefit from that message.

**Chuck Burkell**

U.S. Fire Administration

**Review Of:**

Covey, S. R. (1989). *The 7 habits of highly effective people: Restoring the character ethic*. New York: Free Press. 384 pp. (\$15 paperback).

After being involved in the fire service for a number of years, the transition from firefighter to company officer can be difficult. The change involves becoming the leader of a team, assisting the team and organization in accomplishing its goals, and accepting responsibility for the company's performance during emergencies. The company officer must be able to communicate effectively, express ideas, and have the knowledge, skills, and abilities to perform nonemergency and emergency operations. Stephen Covey's book, *The 7 Habits of Highly Effective People* offers powerful suggestions concerning holistic approaches to problem-solving both in personal and professional lives.

The company officer having the ability to communicate effectively with crew members, having an influence in the field, and having a positive mental attitude are reflections of Covey's thoughts regarding efficiency. Covey considers these to be secondary qualities or techniques. The genuine issue is to provide leadership effectively through "basic goodness" (p. 21). This basic goodness coming from inside the person will give life to the style and technique used to convey the message. Secondary qualities flourish with the assistance from the primary quality of goodness coming from within the person. The combination of primary and secondary qualities will enhance the fire officer's leadership capabilities by fostering strength in integrity and character.

The fire officer must also be aware of the territory and its boundaries. Maps are merely guides to assist the officer through the territory, but the map does not define the territory. The territory is what it is and cannot be changed. The officer must not rely specifically on the map given at the beginning of an emergency. On the other hand, the officer must be able to think that two officers can view a specific incident differently and both be correct. The combination of attitudes and perceptions can lead the company officer into having tunnel vision, not looking at the entire scene or territory, and thus not allowing objectivity into the scheme of things. The company officer should be aware of the map, understand other points of view, accept assumptions from others, and be able to remain objective for a successful outcome. Covey suggests that listening to others, becoming aware of previous assumptions, and having objectivity are parts of getting to the heart of the concern. Is this not part of being a company officer?

Effective company management does not have to be applied solely for fire scene operations. The overall contributions of the department regarding social change are important aspects of making fire personnel feel part of the team. For example, Covey uses the example of allowing employees to take part in writing a mission statement, suggesting décor, and becoming involved in their work. He further feels that if there is no involvement in the organization/company, then a lack of commitment is a likely outcome. The successful company officer can implement the same concepts and create a positive working environment.

An example of this is creating or updating your department's Critical Incident Stress Debriefing (CISD) system. The officer can ask for input from each station and shift concerning any changes or additions that may be needed in order to update the department's CISD. Personnel feel there is a "personal touch" from the officer because individual input is a concern for everyone partaking in the hierarchy. Thus, if fire personnel's feelings and ideas are expressed and used for restructuring, then personnel feel part of the team. This forms a positive atmosphere among personnel because there is sharing among the ranks.

The personal touch does not stop within the office or station confines. A medical run to the hospital can also be an example of going the extra mile. The patient may have forgotten to lock the door, put the cat inside the cage, and take medications along for the journey. Our personal touch can alleviate the patient's concerns by performing the aforementioned actions and conveying those actions to the patient. Has not fire service transformed into customer service over the past decades?

Company officers and personnel creating unity, commitment, and trust also reflect within the community. Much like the example Covey presented with personalized customer service succeeding and being noticed by the public, fire service personnel make a lasting impression on the public through their actions. This book is highly recommended for daily and occupational positive thinking survival. The concepts presented by Covey can be directly applied to the fire service, company officers, and fire personnel. The environment within the fire service (and our personal lives) is constantly changing and can cause stress. Having the ability to remain proactive, relieve the feelings of emptiness by displacing negativity, and detect a unique meaning in life can be assets to the officer.

**David Milen, Ph.D.**  
Walden University

The *International Fire Service Journal of Leadership and Management* is a refereed or peer-reviewed journal published biannually. It is published by Oklahoma State University (OSU), International Fire Service Training Association (IFSTA), and Fire Protection Publications (FPP). Detailed information about the journal is provided below.

### ***Preparing an Article for Publication in IFSJLM***

Articles submitted for review should be in general conformance with the guidelines outlined below. If the manuscript is accepted for publication it is the responsibility of the author(s) to prepare a final manuscript that conforms to *IFSJLM* style requirements and to submit to the editor one hard copy of the final paper and one electronic copy of the paper as a Microsoft Word® file.

Articles should be no longer than 30 pages in length (including tables, figures, references, and notes). Research notes should not exceed 18 total pages. Manuscripts must be typed, double-spaced, on paper sized 8.5 by 11 inches, and use standard margins.

Given the readership of the journal, articles should avoid technical jargon, mathematical modeling, etc. and be of interest to both academics and practitioners. Articles using survey and statistical data are encouraged, but information and findings should be communicated clearly and concisely.

Tables and figures should not be placed in the text. Each table or figure should appear on a separate piece of paper and placed at the end of the manuscript. In the text of the manuscript, indicate approximate placement of tables and figures by using inserts – [e.g., Table 1 About Here].

On a detachable first page of the manuscript include the title of the manuscript and all identifying material for each author – i.e., names, affiliations, mailing addresses, telephones numbers, and email addresses. If the article is co-authored, place an asterisk by the name of the person who will serve as a point of contact. Also on this page provide a short 75 to 100-word biographical sketch that includes information about each author, their positions, their organizations, and previous publications and/or professional interests.

A 50 to 75-word article abstract should accompany an article. The abstract should concisely identify the research question studied, theoretical framework employed, methods used, and major findings of the research.

*IFSJLM* uses the American Psychological Association (APA) reference style to cite literature used in the article. This author-date method of citation requires that you cite the author's surname and date of publication (e.g., Neal, 2000). To cite a specific part of a source, such as a quote from an article, provide the author's surname, date of publication, p. for page and page number (e.g., Neal, 2000, p. 42). For complete information on using the APA style see the 5th edition of *The APA style manual*. This manual can be found at your local bookstore, research library, or can be purchased on-line at: <http://www.apastyle.org/>. Sources cited in the text should be listed in a references list following the style also outlined in the *APA Manual*.

### ***Submission Requirements and Information***

All manuscripts submitted to *IFSJLM*: (1) must be original (not previously published in whole or part in either print or electronic format) and (2) must not be under review for publication elsewhere. Upon acceptance and publication, the Board of Regents for the State of Oklahoma retain the exclusive rights to publication. Journal articles and book reviews are copyrighted by the Oklahoma State University Board of Regents, with all rights reserved. Copyright assignment is a condition of publication. Authors will be provided and will be asked to sign a copyright assignment. Crown manuscripts are exempt from the copyright requirement. Articles submitted for review are not returned. Electronic submissions are NOT accepted.

Please submit four hard (4) copies and one electronic copy in Microsoft Word® format of an article or three hard (3) copies and one electronic copy in Microsoft Word® format of a book review to: Robert E. England, Editor, *International Fire Service Journal of Leadership and Management*, Fire Protection Publications, Oklahoma State University, 930 N. Willis St., Stillwater, Oklahoma 74078-8045.

### ***Article Review Process***

All articles, unless otherwise noted upon publication, submitted to *IFSJLM* are peer reviewed. *IFSJLM* uses a double-blind review process: The author does not know who reviewed the article and the reviewers do not know who wrote the article. Thus, it is important that the author only be identified on the cover page. The editor will remove the cover page before the article is sent out for review. Avoid making references to previous research by referring to oneself in the third person and referencing such work. The review version of the article should not thank colleagues for reviewing a draft of the manuscript or state that an earlier version of the paper was presented at a conference. If accepted for publication, the final version of the article can contain such information. As they read an article, peer reviewers are trying to answer the following questions. Is the material in the article accurate and relevant? Is the article grounded in theory? Are the methods used in the study appropriate and appropriately used? Does the article significantly add to our understanding of fire leadership and management? If not, the article may merit publication, but not in *IFSJLM*.

Reviewers are asked to evaluate articles within a 30- to 45-day time frame. If they cannot meet this parameter, they are instructed to inform the editor as soon as possible so that a new reviewer can be selected. After the editor receives all peer reviews, a decision is made to (1) accept the article for publication (subject to preparation guidelines and editing by journal staff), (2) accept the article pending specific revisions required by the peer reviewers, (3) allow the author to "revise and resubmit" the article for review based on general guidelines suggested by the reviewers, or (4) reject the article. Articles accepted under the "revise and resubmit" category are sent out for a second round of reviewers with no implied guarantee of acceptance. The editor of *IFSJLM* decides which articles will appear in the journal based on the peer review process. Decisions made by the editor are final. Reviewers' comments are made available to manuscript authors. Book reviews are NOT peer reviewed. The journal editor is responsible for deciding which book reviews to include in *IFSJLM*.

## Journal Information

---

### Book Reviews

Book reviews can be of a single book or several books that are tied together by a common theme (e.g., four different books on the topic of terrorism). Book reviews should not exceed five (5) double spaced 8.5" by 11" pages using standard margins. Book reviews are not peer reviewed and are published at the discretion of the editor.

Book reviews should provide thoughtful analyses of the importance, utility, and/or meaning of a single book or several books to the development of the international fire service. In other words, the review should not focus on the merits and demerits of the book itself, but rather should focus on the nexus between the message of the book(s) and the development of fire leadership and management. Book reviews must focus on leadership and management issues, topics, and themes.

### Electronic Access

Electronic access to the journal is not available at this time.

### Permissions:

Contact: Susan F. Walker, Fire Protection Publications, Oklahoma State University, 930 N. Willis St., Stillwater, Oklahoma 74078-8045; E-mail: Royals@osufpp.org, 405-744-7046

## Subscriptions

---

*IFSJLM* is published biannually (usually, but not necessarily in January and July). Subscriptions prices are: \$20 per year for students and \$50 for all other individuals and institutions. A flat fee of \$10 per year is added to all international subscriptions. Proof of student status is not required; we rely on professional ethics.

Please complete this page and submit to:

**IFSJLM-Subscriptions  
C/O Susan F. Walker  
Fire Protection Publications  
Oklahoma State University  
930 North Willis St.  
Stillwater, Oklahoma 74078**

Name: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

Zip/Postcode: \_\_\_\_\_

Phone Number: \_\_\_\_\_

Email: \_\_\_\_\_

*Payment: If paying by credit card, please call 1-800-654-4055. We accept Visa and Mastercard. Please have your card number and card expiration date handy. If paying by check: Make payable to Fire Protection Publications. Remember to add \$10 per year if the journal is being delivered outside of the United States.*

## ***DISCLAIMER***

*The International Fire Service Journal of Leadership and Management* is an academic journal. As such, articles that appear in the journal are “approved” for publication by two to four anonymous members of the Journal’s Editorial Board and/or ad hoc peer reviewers. As editor I do not choose the articles that appear in the journal nor do I edit the content or message of an article once accepted. The copy editor and I only edit for style and readability.

The ideas and comments expressed in an article are those of the author(s) and should not be attributed to members of the Journal’s production team, Editorial Board, or to the sponsors of the journal--which are Oklahoma State University (OSU), the International Fire Service Training Association (IFSTA), and Fire Protection Publications (FPP). We simply publish that which has been peer approved. If for some reason an article causes consternation, you, the reader, are urged to contact the author directly to engage in a dialogue; that is how academic journals work. An author’s e-mail is provided with each article. Or, if you wish, you can submit a three to five page “response” to an article in which you outline significant theoretical and or methodological objections to an article. The response may be accepted for publication. If so, the author will be allowed to offer a three to five page “rejoinder” to the response. This is how academic journals work. For the most part, however, you should direct your comments directly to the author. Responses and corresponding rejoinders will be rare and will be published at the discretion of the Journal editor. Journals are intended to stimulate debate and conversation. If you do not like what you read, contact the author or write an article for peer review that offers an alternative perspective.

**Dr. Robert E. England**  
Editor



Fire Protection Publications



International Fire Service Training Association

---