# Incumbent Fitness Assessments at South Metro Fire Rescue Authority

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## Certification Statement

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

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## Abstract

The South Metro Fire Rescue Authority (SMFRA) is tasked with providing quality emergency services. In order to provide quality emergency services the authority must determine and assess the fitness levels of its membership. This allows the authority to ensure it is sending capable firefighters and emergency medical technicians to each emergency.

The problem is that South Metro Fire Rescue Authority (SMFRA) has not developed a consistent fitness assessment for its firefighters that meets the National Fire Protection Association (NFPA) Standards. The purpose of this research to determine what steps need to be taken to realign SMFRA's current assessment to meet NFPA standards. A descriptive method of research was utilized to answer the following research questions: What are the goals and requirements of the NFPA standards regarding fitness assessments? What are the deficiencies in the current incumbent fitness assessment as it relates to the NFPA standards? What are the goals of the organization for the incumbent fitness assessment? What assessments from other agencies meet the NFPA standards?

The research was conducted using a review of relevant literature, personal interviews, and surveys completed by internal leaders and external fire service professionals. Results of this research indicated that there are several different methods to assess a firefighter's fitness. Survey feedback also showed that respondents considered fitness assessments an important function of the organization. This author's recommendations included discontinuing the Incumbent Physical Agility Test (IPAT) and changing some of the components of the fitness assessment to meet NFPA standards. If implemented these recommendations would provide for a more comprehensive fitness assessment inline with NFPA standards.

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## Introduction

The fire service has struggled with developing a consistent evidence based Incumbent Fitness Assessment for its own membership across the nation. This type of test is used to evaluate the fitness for duty for incumbent firefighters and excludes new hire firefighters. Fitness assessments are necessary to demonstrate effective task performance and to ensure firefighters are healthy enough to perform the job. Firefighting is extremely strenuous physical work and can be one of the most physically demanding of human activities (United States Fire Administration [USFA], 2013, p. 13). Fitness assessments identify predictable problems and can ensure that firefighters are well informed of their individual fitness level. These assessments help administrators deliver the best resources available when responding to emergencies.

The problem is that South Metro Fire Rescue Authority (SMFRA) has not developed a consistent fitness assessment for its firefighters that meets the National Fire Protection Association (NFPA) Standards. The purpose of this research is to determine what steps need to be taken to realign SMFRA's current assessment to meet NFPA standards. A descriptive method of research was utilized to answer the following research questions: What are the goals and requirements of the NFPA standards regarding fitness assessments? What are the deficiencies in the current incumbent fitness assessment as it relates to the NFPA standards? What are the goals of the organization for the incumbent fitness assessment? What assessments from other agencies meet the NFPA standards?

## Background and Significance

The South Metro Fire Rescue Authority is located in the southern portion of the Denver metropolitan area and serves approximately 176 square miles in portions of both Douglas and

Arapahoe Counties in Colorado. Services are provided to the incorporated cities of Castle Pines, Centennial, Cherry Hills Village, Foxfield, Greenwood Village, Lone Tree, Louviers, and the Town of Parker. The overall makeup of the district ranges from high-density urban, to a suburban bedroom community to rural in nature.

In May 2008, the Parker Fire Protection District and South Metro Fire Rescue merged to form the South Metro Fire Rescue Authority, a special district that provides fire protection, emergency medical services, and special operations consisting of aircraft crash fire rescue, hazardous material operations, dive rescue and recovery, technical rescue, and wildland urban interface firefighting to more than 198,000 full-time residents, which then rises to approximately 250,000 citizens during normal business hours. In 2011, SMFRA responded to approximately 15,758 incidents, of which 9104 were medical in nature.

SMFRA is a fully paid career department that services its citizens with 17 stations comprised of 12 engine companies, four tower companies and nine medics (ambulances staffed solely with firefighting personnel). SMFRA also has automatic aid agreements with the Cunningham Fire Protection District, Franktown Fire Protection District, Castle Rock Fire Rescue, West Douglas County Fire Protection District, West Metro Fire Protection District, Littleton Fire Rescue, and Englewood Fire Department. Mutual aid agreements are also in place with the Denver Fire Department and Aurora Fire Department, two adjacent municipal departments.

SMFRA used an Incumbent Physical Agility Test (IPAT) from 2009 until mid 2012 to test incumbent firefighters. The test was validated and was a pass/fail test. The incumbents were given seven minutes to complete the fire ground task-based test. If the firefighter did not meet the seven minutes time limit a disciplinary process was in place that allotted a period of time to

improve and test again based on how far outside the seven minute standard the firefighter was. In the spring of 2012 two firefighters had significant medical problems within hours of taking the IPAT. One firefighter went into cardiac arrest and was successfully resuscitated and is currently back on duty as a firefighter. The other firefighter had a myocardial infarction requiring hospitalization and surgery. This firefighter has also returned to full duty as a Lieutenant.

As a result of the medical problems experienced by the two firefighters, a significant emotional response occurred from the line firefighters. Most of the response focused on the validity of an IPAT. Members voiced concern that the test was not in line with NFPA standards for incumbents and that the goal of the test was unclear and not researched based. Further complicating the issue was the fact the State of Colorado had a workers compensation law that states that any cardiac emergency while at work is not considered to be caused by the job. (Colorado Revised Statutes, 2014) Due to this law, both of the medical emergencies experienced by the two firefighters were not covered by workers compensation insurance. This further elevated the concern of the firefighters of SMFRA that although the test was a job requirement any potential cardiac problem would not be covered. Informal debate was present in the stations and the administration immediately following the events. SMFRA Assistant Chief of Operations Bob Baker made the decision to immediately postpone any further testing. Assistant Chief Baker stated, “It was necessary to stop the test and re-evaluate and ensure that it was the right thing to do for our firefighters” (B. Baker, personal communication, February 19, 2014).

SMFRA has a minimum staffing of 287 firefighters covering three shifts. These three shifts operate on a 48/96 work schedule and work out of 17 stations. Each fire station is outfitted with dayrooms, sleeping quarters, and exercise rooms that a have a standard cache of equipment. This standard set of equipment includes both cardiovascular endurance equipment and weight

lifting equipment. SMFRA firefighters are given time each shift to workout. The recommended minimum time given to supervisors is at least one hour per day. The workout sessions are not mandatory, but encouraged. In addition to the exercise rooms in the stations SMFRA also maintains exercise facilities at its training center and two administrative buildings, which are open to both on duty and off duty personnel and family members.

Additionally, SMFRA has a Fitness Coordinator who oversees the purchasing of equipment, a staff of peer fitness trainers, the annual IPAT test, fitness programs and recruit academy fitness training. The Fitness Coordinator and staff of peer fitness trainers are available to the firefighters for workout recommendations, injury prevention tips, and specialized workout designs. Each year the fitness team puts an incentive program together that encourages a higher level of wellness and fitness throughout the organization. An example was a contest in 2013 to see who could lower their body fat percentage the most held in 2013. SMFRA supplied a Bod Pod water displacement measurement at a reduced price for each participant and prizes for whoever reduced their body fat the most. These types of programs have been very well received by the employees and have been successful in total participation numbers. Past surveys regarding the wellness and fitness support provided by SMFRA have been very positive with a majority of those survey being satisfied or very satisfied (S. Hegarty, personal communication, February 1, 2014).

SMFRA entry-level firefighter recruits are required to pass the Candidate Physical Ability Test (CPAT) and have a current certificate attained within the prior six months (*SMFRA Policy*, 2014, 2). The CPAT was designed by the International Association of Firefighters (IAFF) and the International Association of Fire Chiefs (IAFC). It was a collaborative venture to create a test that is consistent and valid for entry-level recruits (International Association of

Firefighters, n.d., p. 1). This test is designed for entry level only and not designed for use to test incumbent firefighters. The CPAT is a series of eight separate events that are done consecutively. These events are designed to simulate fire ground tasks with actual equipment found in the fire apparatus across the country. The candidates must pass the test within a total time of ten minutes and twenty seconds. The test is administered by certified CPAT proctors who are trained to the standards set by the IAFF and IAFC. The candidates are offered both an orientation and minimum of two practice sessions prior to the actual test. The suggested time from orientation to the test is eight weeks.

The former South Metro Fire Rescue and the Parker Fire Protection District both required incumbent firefighters to pass an IPAT to maintain employment. These two tests differed in time allowed and tasks required. In 2009, when the two agencies merged the test from South Metro Fire Rescue was chosen as the new IPAT for SMFRA. This test had been previously validated for use at the Metro Fire Training Center and was not re-validated for the Parker Fire Training facility. When moving an IPAT to a new facility it is a requirement to validate the test at the new location. This is due to the new layout and obstacles, which can create challenges for the candidates and may need to be changed to accommodate the differences. The decision to re-validate the new location was justified by the similar layout of both facilities (D. Daley, personal communication, February 19, 2014).

The SMFRA IPAT consisted of five events with a pass or fail time of seven minutes. The five events consisted of the participant climbing five flights of stairs in full bunker gear, breathing from a self-contained breathing apparatus (SCBA) and carrying a hose pack. The second task was accomplished at the top of the stairs with the participant dropping the hose pack and hoisting one fifty foot section of two and one half inch hose up the side of the building to the

fifth floor. The participant would then descend the stairs and proceed to the forcible entry sled. This task required them to move a sliding block with sledgehammer approximately 36 inches. The participant would then move onto the hose drag simulation. This event required the participant to drag a weighted sled 75 feet. The final event required the participant to drag a 175-pound mannequin 100 feet. Participants completing the test in under seven minutes were considered to have passed the test. Participants with a time greater than seven minutes were put into a disciplinary algorithm based on the amount of time they exceeded the test maximum. Very few SMFRA firefighters failed the test each year and it was generally considered easy if you were in relatively good shape (S. Hegarty, personal communication, February 1, 2014). No firefighters experienced significant medical problems from 2009 to 2012. Minor injuries such as strains and sprains had occurred, but nothing requiring overnight hospital admission.

SMFRA contracts with a large healthcare network for a designated physician titled the Authority Physician. The Authority Physician oversees the health and fitness evaluations in collaboration with qualified physical therapists and physiologists that are also involved in member rehabilitation. SMFRA firefighters receive a fit for-duty physical when they are hired. The frequency thereafter is based on age. For example, firefighters 40 years or older are required to have a physical every year. The physical exams are conducted by the Authority Physician and are recorded in a confidential database. The exam includes a sub maximal treadmill test with 12 lead electrocardiogram monitoring, blood work, chest x-ray every five years, physical exam, a pulmonary function test, hearing test, vision test, and body composition. Optional items include prostrate screening, mammogram, and HIV testing. If a firefighter has an abnormal result in any part of the exam they are referred to a specialist or their primary care physician for follow up. If the result of a test prohibits them from performing their essential job function they may be put on

sick leave until a prognosis has been determined. The Authority physician follows NFPA 1582 when determining whether a firefighter is fit-for-duty via a physical.

The SMFRA IPAT is on hold and the organization is in the process of determining which direction it will go. The reason for the continued delay was to conduct research on what was the current best practice for incumbent fitness assessments. Several members of the organization were assigned research topics to determine what other agencies are doing, what does the private sector do for industrial athletes, and which are providing the best outcomes. SMFRA decided to hire a full-time Wellness/Fitness Coordinator to manage all wellness, fitness and workers compensation responsibilities for the organization. This position will be filled in early 2014.

The future of the IPAT and fitness of the incumbent firefighters will be in the hands of the new Wellness/Fitness Coordinator. It will be the responsibility of the coordinator to ensure that we are evaluating the fitness of the firefighters effectively and taking steps to maintain fitness levels each year. The importance of this cannot be underestimated. There is a potential for employee hardship and liability if appropriate actions are not taken and change instituted. This challenge has not been limited to only SMFRA. The fire service in general is faced with the same challenges. IPATs have been a long-standing tradition in many fire service organizations. This author found that when conducting research of 20 medium to large fire service organizations only 20 percent conducted IPATs as a fitness evaluation. Historical data was not available at the time of research and any change couldn't have been determined.

The IAFF currently has a program in place to assist fire service organizations with starting and maintaining wellness and fitness programs. This program is called the Wellness Fitness Initiative. The following list of bullet points describes the areas of service the initiative was designed to provide guidance for (International Association of Firefighters, n.d., p. 1):

- Medical Evaluation
- Fitness Evaluation
- Injury and Medical Rehabilitation
- Behavioral Health
- Cost Justification
- Data Collection

The IAFF identified and partnered with 10 task force cities to implement and track outcomes after implementation of the program. Grant monies were made available for equipment, staffing, and operating costs. The fitness evaluation portion of the initiative was a diverse approach. The evaluation consisted of a V02 max treadmill test, Functional Movement Screening, and a Fit for Duty physical. The V02 max treadmill test was designed to evaluate the incumbent's cardiac health under a workload. The Functional Movement Screening was designed to provide injury prevention tips to firefighters by doing a series of exercises to identify problem areas and recommend solutions to improvement. The fit-for-duty physical was a standard physical that would meet NFPA 1582 requirements.

The Executive Development curriculum stated that one of the goals of the course was to provide the Executive Fire Officers with opportunity to use their research to solve problems in their organizations ("Executive Development," 2011, p. 13-3). This paper will aid SMFRA and other organizations in progress towards better fitness assessments for their employees and solving the problems associated with past tests. This paper will also address the United States Fire Administration (USFA) operational goal number 3: *Improve the Fire and Emergency Services' Capability for Response to and Recovery from all Hazards* (United States Fire Administration, n.d., p. 13). The paper will help create a better IPAT and essentially impact the response and recovery efforts by having fit and capable responders.

## Literature Review

The literature review of this research paper is primarily focused on the requirements of the NFPA Standards regarding fitness assessments. The following is a review of all the NFPA Standards associated with fitness assessments. This review also includes fitness standards and assessments from the military and OSHA.

The National Fire Protection Association was formed in 1896 in New York City, New York to advance a collaborative approach to sprinkler system standards. Over the past 100 years the organization has organized and standardized the fire service regulations in the United States. Today the mission of the NFPA continues with over three hundred consensus codes and standards that intended to minimize the possibility and effects of fire and other risks (National Fire Protection Association, n.d., p. 1). The three main NFPA Standards that address the problem identified in this research paper are listed below:

- NFPA 1500: Standard on Fire Department Occupational Safety and Health Program
- NFPA 1582: Standard on Comprehensive Occupational Medical Program for Fire Departments
- NFPA 1583: Standard on Health-Related Fitness Programs for Fire Department Members

These three standards provide guidance for fire agencies across the country in reference to medical requirements, fitness testing, and fitness standards.

NFPA 1500 was published in 1987 as the first standard to address firefighter safety for the United Sates fire service organizations. The intent was to limit the number of line of duty injuries and death by providing standards that addressed operations, health and wellness, and equipment (*NFPA*, 2013, p. 3). Chapter 10 of the standard is titled Medical and Physical Requirements. In this chapter, section 10.2.3 states " Members who engage in emergency

operations shall be annually qualified as meeting the physical performance requirements established by the fire department." (*NFPA*, 2013, p. 30). This states that each fire department shall have physical performance requirements. This standard does not identify what the requirements should be and that will be discussed in another standard. Section 10.2.4 states "members who do not meet the required level of physical performance shall not be permitted to engage in emergency operations" (*NFPA*, 2013, p. 30). The standard also states that each firefighter should be seen by a physician that is contracted with the fire agency.

NFPA 1500 2013 Edition provides the general guidance to agencies for fitness assessments and requires a professional process for rehabilitation. This is a standard for fire agencies when developing plans for fitness and wellness evaluations

NFPA 1582 Standard on Comprehensive Medical Programs for Fire Departments 2013 Edition is designed to provide guidance on establishing standards for medical testing, minimum performance and specific testing criteria. Section 5 identifies the 13 essential job functions and provides variance for all functions. The Essential Job Functions are listed in Appendix A of this paper. These functions cover operating in a Self Contained Breathing Apparatus (SCBA), firefighting activities, hazardous environments, climbing stairs, personal protective equipment, operating emergency vehicles, functioning as a team member, communications, and working in tight enclosed spaces (*NFPA*, 2013, p. 10). These are listed with explanation, but can be subjective when deployed for testing purposes. These 13 job functions are identified as benchmarks and can be used to justify taking a firefighter offline and into a rehabilitation program. The standard does not imply that incumbents should be tested on these annually, but implies these are the essential job functions that should be measured when determining fitness for duty.

NFPA 1582 2013 Edition states that the fitness assessment should not be punitive or competitive and should be only compared to each individual's past performance. Furthermore, it states that a norm or specific standard should not be used for comparison during the evaluation. The fitness assessment should be scheduled after the medical screening and should have a pre-evaluation prior to the test. Aerobic capacity testing is required as well with a sub-maximal or maximal treadmill test given as options. The standard goes on to list certain specifics regarding the aerobic capacity testing and identifies 12 METs as the benchmark for fitness counseling and eight METs as the point in which a firefighter would be restricted from performing the essential job functions. The strength evaluation consists of grip strength, leg strength, arm strength, a push up and curl up evaluation, and a flexibility assessment (*NFPA*, 2013, p. 20). Specific details are also listed in the standard regarding the areas of testing. Consequently, an IPAT is not listed as a mandatory part of the fitness evaluation in this standard.

NFPA 1583 is titled *Health Related Fitness Programs for Fire Departments* and was first published in 2000 with the current edition being 2008. This standard is designed to provide guidance on fitness and wellness programs for firefighters specifically. The standard generally addresses how to manage the programs and identifies key positions to establish in order to manage the program. The first position is the Health and Fitness Coordinator (HFC) who would oversee the program and manage anyone involved in the fitness assessment. The Peer Fitness Trainer (PFT) is defined as staff that works directly for the Health and Fitness Coordinator and oversee safe participation in health-related fitness programs ("NFPA 1583," 2008, p. 6). This standard also addresses health promotion, exercise programs, data collection and the fitness assessment.

According to NFPA 1583 2008 Edition all members should participate in the fitness assessment annually under the supervision of the HFC. The standard also echoes NFPA 1500 and 1582 stating the assessment should remain non-punitive and confidentiality of assessment results should be maintained. The standard provides options for developing a fitness assessment. The areas of assessment are aerobic capacity, body composition, muscular strength, muscular endurance, and flexibility. Each area has at least four suggested exercises that would evaluate each area of the assessment. Additionally, an appendix provides greater details on how to properly conduct each component of the testing. This standard has been used to continue to define how fitness and wellness programs are maintained by fire agencies.

The Occupational Health and Safety Association (OSHA) also regulates fire agencies with specific standards for many different areas for firefighting and emergency response. OSHA Standard 29 CFR 1910.156(b)(2) mandates, “The employer shall assure that the employees who are expected to do interior structural firefighting are physically capable of performing duties which may be assigned to them during emergencies” ("OSHA 29 CFR 1910.156," 2012, Chapter 156). The assessment is not specifically defined, yet is required.

This author researched the fitness assessments and standards for the armed forces via www.military.com. The armed forces have a public website that lists different standards and assessments by branch. The United States Military has fitness standards that vary by branch of service. The United States Army has an annual fitness assessment that is broken down by age. The exercises remain the same with the number of repetitions decreasing with age. The assessment is also broken down by gender. Males are required to do more repetitions and have faster run times than females. The fitness assessment consists of the following exercises: two-mile run, push ups, and sit ups. An example of this is a male age 22 to 26 years old has to do a

minimum of forty push ups and 50 sit ups and a female would be required to do a minimum of 17 push ups and 50 sit ups. The Army also has a body composition standard as well. This standard again varies by age and gender. An example of this standard is a male age 28 to 39 years old would be required to have a body fat score of less than 24% and a female the same age would be required to have a body fat score of less than 36% (Military.com, n.d., 1). The military fitness standards are very similar to the fire service.

Several agencies across the nation provide fitness assessments that are inline with the NFPA standards. The assessments that are offered vary in design, but are within the parameters of the NFPA. Research was conducted via the Internet to find fitness assessments that met the standards. The Phoenix Fire Department (PFD) located in Phoenix, AZ provides information regarding its fitness assessment and associated policies via the IAFF website (International Association of Firefighters, n.d.). This website describes the fitness assessment process and the measurable data they use for evaluation purposes. Additionally, an agency named West Metro Fire Rescue (WMFR) located in Lakewood, CO also provides information on the agency website that describes their fitness assessment (West Metro Fire Protection District, n.d.). This author reviewed and compared the assessment information to the NFPA standards to determine compliance. These two fitness assessments provided by the agencies listed previously provided an example of NFPA compliant assessments.

This author also searched previous EFO papers for similar topics. One EFO paper titled "Incumbent Physical Ability testing for Sioux Falls Fire Rescue: Does it Measure Up?" by Brad Goodroad discussed similar issues relating to the use of IPATs. Goodroad's research goal was to determine whether his agency should use an IPAT as a fitness assessment (Goodroad, 2011). His research also evaluated body fat percentages from before and after the IPAT was introduced.

Goodroad's recommendations were to continue with the IPAT as a fitness assessment with understanding that some changes would need to be made for it to be a measurable tool. These changes included using V02 max as measurement tool, not requiring bunker gear and SCBA be worn, and modifying the dummy drag procedure (Goodroad, 2011).

In summary, the purpose of this literature review was to examine the NFPA Standards associated with fitness assessments and to also look at other types of occupational fitness assessments. The research proved beneficial to determine the current standards and objectives of fitness assessments according to the NFPA. Value was gained from looking at other occupations fitness standards and assessments. The literature showed that the goal of the fitness assessment is to obtain a measured and validated assessment. The literature influenced this author to look at the format and the measureable data that the assessment produces. By using measurable data and uniform procedures the firefighters and administrators will have a better assessment of fitness levels.

## Procedures

This applied research paper utilized a descriptive research method. The first procedure was a literature review. The author utilized the Learning Resource Center (LRC) at the National Fire Academy (NFA) in Emmitsburg, MD. This procedure consisted of researching other EFO papers on fitness assessments and standards. Most results found were focused on designing wellness programs and the CPAT for new hire firefighters.

The second procedure was to conduct interviews with SMFRA leadership, which included the Authority Fire Chief, Operations Chief, EMS Chief, and the Human Resources Director. These interviews were conducted in person at our administration building with responses recorded by the author. The following questions were asked in the interviews: 1. What

is the goal of the SMFRA fitness assessment or IPAT? 2. After the events of 2012 do you feel that the fitness assessment/IPAT needed to be changed? 3. NFPA 1500, 1582, and 1583 all state that the fitness assessments must be non-punitive and confidential. Do you agree with these mandates? 4. Should fitness assessments be punitive? 5. Would you favor a system of fire ground task completion over a period of time with consistent objective skills versus an IPAT style test? 6. How important do you feel injury prevention screening and training should be?

The third procedure was the creation of a survey using SurveyMonkey and distributing it to firefighters and fire administrators in the United States and internationally. The survey was distributed to peers in the Executive Development class, an Internet fire service networking blog site, and to the SMFRA officer group in February of 2014. An email was sent to each of the respondent groups to explain the purpose of the survey and importance of their feedback. The total distribution was 420 respondents. These groups were chosen due to the diversity of the agencies represented and number of officers and leaders associated with the groups of respondents. It was important to use the officer group from SMFRA and the EFO group to include the leadership perspective on the topic. These groups will be leading their respective organizations in the future and will carry their opinions and practices forward with them.

89 surveys were completed giving the survey a 21% sample size. The survey was intended to gain perspective on the goals and opinions towards the fitness assessments in general. The following were the questions included in the survey: 1. Does your agency do an annual physical agility test? 2. If your agency does a physical agility test, do you believe it adequately measures your level of fitness? 3. Does your agency provide a fit-for-duty physical process with a physician? 4. Does your agency have a wellness program? 5. If your agency offers a fit-for-duty physical or physical agility test, are either punitive? 6. Does your agency's fitness

or wellness plan comply with NFPA 1582? 7. Does your agency's fitness or wellness plan comply with NFPA 1583? 8. Provide a rating of the effectiveness of your agency's wellness program. 9. Please rate the importance of a incumbent physical agility test as it relates to fit for duty. 10. Has your agency had a significant injury or death during any agency related fitness evaluation?. The survey questions can be found in Appendix A.

There were limitations after the completion of the survey. One limitation of the survey was the size and type of agency was not made a choice available to the respondents. This limitation would not allow the author to determine if similarities to SMFRA and other agencies exist. This limitation can alter the interpretation of the results due to resource availability and funding.

The fourth procedure was to conduct research on agencies that conduct fitness assessments that comply with NFPA standards. This author utilized agency websites, and the IAFF website to conduct the research. Several agencies were discovered that conduct IPAT based fitness assessments in different forms and frequencies. The other assessment formats discovered included assessments that followed the recommendations of NFPA 1582 & 1583 and combination tests that included NFPA recommendations and included an IPAT. Two specific tests will be discussed in the results section of this paper.

These procedures identified the standards associated with fitness assessments and the SMFRA leadership perspective on the fitness assessment. By conducting the surveys this author was able to gain the opinions of officers and peers from the United States and from some international fire service leaders.

## Results

The first research questions was “What are the goals and requirements of the NFPA standards regarding fitness for duty?”. The following is a review of the applicable standards and the results of the research.

The literature review was the best source of information to answer this research question. The goals of the NFPA standards regarding fitness assessments are identified in all three of the standards that govern fitness assessments. These standards are NFPA 1500, 1582, and 1583. The goal of the fitness assessments is to have a non-punitive and confidential assessment of each firefighter’s fitness level to ensure they are able to perform the 13 essentials functions of the job established by NFPA 1582 (*NFPA*, 2013, p. 20). The approach identified in each standard provides a guide, standard, and minimum recommendation for each portion of the suggested testing content. The suggested tests cover full body testing and aerobic assessments. However, the non-punitive portion of the goals can be misleading. The NFPA does recommend rehabilitation and restriction of duty if a firefighter cannot meet the minimum fitness level established both by the NFPA and the fire agency (*NFPA*, 2013, p. 30).

NFPA 1500 states that fitness assessments shall be conducted in accordance with NFPA 1583 (*NFPA*, 2013, p. 30). However, NFPA 1582 has additional requirements for the fitness assessment process as well. The requirements for the fitness assessment according to NFPA 1582 and 1583 are broken down into five categories: Aerobic Capacity, Body Composition, Muscular Strength, Muscular Endurance, and Flexibility (*NFPA*, 2013, p. 20). The requirements of each fitness assessment category will be discussed in the following paragraphs.

NFPA 1582 requires all participants to undergo a Pre-Evaluation Procedure prior to conducting any portion of the fitness assessment (*NFPA*, 2013, p. 64). The Pre-Evaluation Procedure is a four-step process that must be completed with each portion of the fitness

assessment if run at different times. The first of the four steps is a medical clearance within twelve months prior to the fitness assessment by the Authority Physician. The second part of the procedure is to notify the employee of the time and place of the fitness assessment. This includes a clear explanation of the expectations of the assessment. The third part of the procedure is obtaining a resting heart rate and blood pressure for each participant. Disqualifying factors include a resting heart rate over 110 beats per minute and a blood pressure exceeding 160/100 mm Hg (*NFPA*, 2013, p. 64). The last part of the procedure is a health status review. This is a list of questions that if a positive answer or "Yes" were given this would be considered a contraindication to continue in the fitness assessment. Appendix C of this paper has a complete list of the Pre-Evaluation Procedures. These procedures are designed to identify any predictable problems prior to the start of the fitness assessment.

The first component of the assessment is the Aerobic Capacity Assessment. The Aerobic Capacity test is designed to evaluate the firefighter's cardiac fitness and endurance. NFPA 1582 states the options for providing this are the following, sub-maximal treadmill test or a maximal treadmill test (*NFPA*, 2013, p. 20). These tests are designed to measure the total Metabolic Equivalents (MET) during the exercise. A MET is defined as " the resting metabolic rate, that is, the amount of oxygen used while at rest, sitting quietly in a chair, approximately 3.5ml 02/kg/min" (Wiley Online Library, 1990, p. 1). NFPA 1582 states that the minimum MET level should be 12 METs and recommends that firefighters falling below 8 METs should begin a rehabilitation program and considered to be restricted from doing the essential job functions of a firefighter (*NFPA*, 2013, p. 20). NFPA 1583 Annex A offers several alternatives to the treadmill test if the treadmill options are not available. The IAFF and IAFC Wellness Fitness Initiative states that the V02 Maximal Test is the best treadmill based maximal test to determine aerobic

capacity of firefighters. This test is used to determine the maximal amount of oxygen that can be consumed and utilized per minute (International Association of Firefighters, n.d., p. 13). This test falls into the maximal treadmill category and would be permissible per NFPA 1582.

The second portion of the fitness assessment is the body composition assessment. This test measures the percentage of body fat of each firefighter. NFPA 1582 states the purpose of this test is to "provide department health surveillance" (*NFPA*, 2013, p. 20). NFPA 1582 and NFPA 1583 offer several suggestions of how to perform the test that are acceptable to the standard.

The third portion of the fitness assessment is Muscular Strength. There are three different evaluations in this portion of the assessment. The evaluations include a grip strength evaluation, leg strength evaluation, and an arm strength evaluation (*NFPA*, 2013, p. 20). NFPA 1583 offers suggested testing methods for each different evaluation in this portion of the assessment.

The fourth portion of the fitness assessment is the Muscular Endurance test. This test includes a push up evaluation and a curl up evaluation for each firefighter (NFPA 1583, 2000, p. 9). This assessment is designed to test core endurance and upper body endurance utilizing your own body weight as resistance. NFPA suggests several exercises to accomplish both evaluations.

The fifth and final portion of the fitness assessment is the Flexibility test. This test identifies the flexibility of each firefighter and can identify potential injury problems. NFPA 1582 suggests several exercises to aid in determining flexibility (NFPA 1583, 2000, p. 9).

The second research question was “What are the deficiencies in the current IPAT as it relates to the NFPA Standards?” The following are the results of the comparison of the standards and the current IPAT offered by SMFRA.

The current SMFRA fitness assessment is a combination of two processes: the IPAT and the fit for duty physical conducted by the Authority Physician. This fit-for-duty physical is conducted in each firefighter’s birth month. Firefighters under the age of 40 receive fit-for-duty physicals every two years and firefighters over 40 receive them every year. The fit-for-duty physical is conducted at the Authority Physician’s office, a blood testing lab, and a contract cardiac treadmill testing office. The IPAT was held annually in the spring of each year. These two assessments were independent of each other. This is a deficiency of the current IPAT according to NFPA 1582 and 1583. NFPA 1582 and 1583 state that each firefighter shall be medically cleared by the Authority Physician within 12 months prior to the assessment. Firefighters under the age of 40 were only given fit-for-duty physicals every two years per policy and would fall outside of the 12 month timeframe.

The fit for duty physical covers two of the evaluations of the fitness assessment recommended by the NFPA. The first is the body composition evaluation. The Authority Physician utilizes the Body Mass Index (BMI) chart to determine the body composition of each firefighter. The BMI is a height and weight chart that determines body fat percentage. This is considered an acceptable test according to Annex A of NFPA 1583 (NFPA 1583, 2000, p. 9).

The second evaluation covered during the fit for duty physical is the sub-maximal treadmill test. This test is conducted at a contract cardiac treadmill testing facility. A trained professional that has access to emergency medical equipment in the event of a medical emergency administers the test. Prior to the test a complete medical history form is filled out by

the firefighter and reviewed prior to beginning of the test. A resting heart rate and blood pressure were obtained prior to the start of the test as well. The test is a sub-maximal test that includes twelve lead cardiac monitoring prior to the test, during the test, and after the test. The results were forwarded to a cardiologist to review and then forwarded to the Authority Physician. This process is compliant and allowed based on NFPA 1582 and 1583. However, NFPA 1583 recommends that the V02 max treadmill test be used to determine firefighter fitness levels due to its accuracy in measurement (NFPA 1583, 2000, p. 13).

The remaining evaluations of the NFPA recommended fitness assessment are not specifically tested in the SMFRA fitness assessment. These include grip strength, muscular strength, muscular endurance, and flexibility. The SMFRA IPAT was used to run each firefighter through a series of events that tested overall endurance and consecutive task accomplishment. However this test did not specifically or consistently measure these specific areas. This is a deficiency of the fitness assessment when comparing it to the NFPA standards. Another deficiency of the IPAT was that the four step pre-evaluation procedures were not completely followed. A heart rate and blood pressure were not taken prior to the test or after and a pre-test health questionnaire was not provided (*NFPA*, 2013, p. 64).

The third research question was “What are the goals of the organization for the Incumbent Physical Agility Test?” To answer this research question this author conducted a series of interviews with several leaders of SMFRA. A survey was also created online via Survey Monkey. The interviews were designed to gain the perspective of SMFRA leaders and the survey was conducted to gain a broader perspective from leaders in the fire service both nationally and internationally. The results of both instruments are listed below.

The following are the questions that were asked of each leader interviewed and their responses to the questions.

The first question in the interview was "What is the goal of the SMFRA fitness evaluation or IPAT?" The following are the responses from each party interviewed:

- To provide a baseline standard for firefighter fitness. To ensure the safety of firefighters operating on calls. To provide good service to the citizens.
- Identifies a level of fitness at one point in time, but unfortunately does not have a historical perspective. Needs a comprehensive approach.
- It determines the physical ability of the firefighters for their own safety.
- To detect health related problems prior to having a medical problem on an emergency or in training.

The second question in the interview was "after the events of 2012 do you feel that the fitness evaluation/IPAT needed to be changed?" The following are the responses from each party interviewed:

- Yes, after any significant event you should evaluate the process and make sure it is accomplishing the goal in a responsible and safe manner."
- Yes, I felt we should validate the process and validate the goals of the organization"
- Yes, I believe there was a reasonable doubt to investigate regarding the test."
- Yes, we should always look for safer and more effective ways to do things."

The third question in the interview was "NFPA 1500, 1582, and 1583 all state that the fitness evaluations must be non-punitive and confidential. Do you agree with these mandates?"

- No, a standard needs to be met and it is our responsibility to our co-workers and citizens.
- Not entirely, should have a punitive approach with a reality that you have to be capable"
- No, I do not agree with them.
- I disagree; we need to protect firefighters and our customers.

The fourth question in the interview was "should fitness evaluations and physicals be punitive?"

- Yes, with a healthy support system behind them
- Yes, with opportunity to recover over a period of time
- Yes, and performance improvement should be utilized if there is a problem
- Yes, within reason in regards to rehabilitation

5. The fifth question in the interview was "would you favor a system of fire ground task completion over a period of time with consistent objective skills versus an IPAT style test?"

- Yes, providing it covered everything necessary
- Yes, that would be a better tool that is applicable to the job
- Absolutely, the IPAT is not a realistic series of events on the fire ground
- Yes, I believe that would be a holistic approach to completing the objectives

The sixth question asked in the interview was "how important do you feel injury prevention screening and training should be?"

- All parties interviewed answered that believe injury prevention is very important in a fitness and wellness program.

The leaders of SMFRA have very similar opinions on the goals of fitness assessments for the firefighters. They believe that the assessments need to be conducted to ensure the safety of the firefighters and to ensure good service delivery by maintaining fitness standards. The leaders also agree that fitness assessments should be punitive, yet allow time to rehabilitate to meet the standard. These components are acceptable when reviewing the NFPA standards and have been in place at SMFRA in both the IPAT and the physical. According to the interview responses the leaders are open to alternative methods of evaluation, specifically the task completion components of the assessments. The final conclusion from the interviews is that the leaders felt that injury prevention training and education should be a part of the annual fitness assessment as well. This piece is not currently included in any part of the fitness or wellness program and there are many options on how to implement a program for this purpose.

The following charts are the results of the survey conducted in February of 2014. The survey had 89 (21%) responses and was distributed to fires service professionals nationally and internationally via a fire service networking blog called Colorado Firefighter on Facebook, email groups and the author's EFO Executive Development classmates.

Question #1

| Does your agency do an annual incumbent physical agility test? | | |
|---|---|---|
| **Answer Options** | **Response Percent** | **Response Count** |
| Yes | 57.3% | 51 |
| No | 42.7% | 38 |
| | *answered question* | 89 |
| | *skipped question* | 0 |

Question #2

| If your agency does a physical agility test, do you believe it adequately measures your level of fitness? |
|---|

| Answer Options | Response Percent | Response Count |
|---|---|---|
| Yes | 42.0% | 37 |
| No | 20.5% | 18 |
| No Test | 37.5% | 33 |
| | *answered question* | 88 |
| | *skipped question* | 1 |

Question #3

| Does your agency provide a fit for duty physical process with a physician? | | |
|---|---|---|
| **Answer Options** | **Response Percent** | **Response Count** |
| Yes | 78.7% | 70 |
| No | 21.3% | 19 |
| | *answered question* | 89 |
| | *skipped question* | 0 |

Question #4

| Does your agency have a wellness program? | | |
|---|---|---|
| **Answer Options** | **Response Percent** | **Response Count** |
| Yes | 64.8% | 57 |
| No | 35.2% | 31 |
| | *answered question* | 88 |
| | *skipped question* | 1 |

Question #5

| If your agency offers either a fit for duty physical or physical agility test, are either punitive? | | |
|---|---|---|
| **Answer Options** | **Response Percent** | **Response Count** |
| Select all that apply | 1.3% | 1 |
| IPAT - Yes | 34.2% | 27 |
| IPAT - No | 36.7% | 29 |
| Physical - Yes | 36.7% | 29 |
| Physical - No | 58.2% | 46 |
| | *answered question* | 79 |
| | *skipped question* | 10 |

Question #6

| Does your agency's fitness or wellness plan comply with NFPA 1582? | | |
|---|---|---|
| **Answer Options** | **Response Percent** | **Response Count** |
| Yes | 27.0% | 24 |
| No | 24.7% | 22 |
| I Don't Know | 48.3% | 43 |
| *answered question* | | **89** |
| *skipped question* | | **0** |

Question #7

| Does your agency's fitness or wellness plan comply with NFPA 1583? | | |
|---|---|---|
| **Answer Options** | **Response Percent** | **Response Count** |
| Yes | 23.6% | 21 |
| No | 27.0% | 24 |
| I Don't Know | 49.4% | 44 |
| *answered question* | | **89** |
| *skipped question* | | **0** |

Question #8

| Provide a rating of the effectiveness of your agency's wellness program? | | |
|---|---|---|
| **Answer Options** | **Response Percent** | **Response Count** |
| No test | 17.0% | 15 |
| 1 Low | 14.8% | 13 |
| 2 | 13.6% | 12 |
| 3 | 29.5% | 26 |
| 4 | 13.6% | 12 |
| 5 High | 11.4% | 10 |
| *answered question* | | **88** |
| *skipped question* | | **1** |

Question #9

| Please rate the importance of a incumbent physical agility test as it relates to fit for duty? | | |
|---|---|---|
| **Answer Options** | **Response Percent** | **Response Count** |
| Essential | 44.8% | 39 |
| Important | 34.5% | 30 |
| Somewhat Important | 14.9% | 13 |

| | | |
|---|---|---|
| Not Important | 5.7% | 5 |
| | *answered question* | 87 |
| | *skipped question* | 2 |

Question #10

| Has your agency had a significant injury or death during any agency related fitness evaluation? | | |
|---|---|---|
| **Answer Options** | **Response Percent** | **Response Count** |
| Yes | 10.2% | 9 |
| No | 89.8% | 79 |
| | *answered question* | 88 |
| | *skipped question* | 1 |

Survey questions #1 and #2 show that of the 89 respondents, 57.3 have an IPAT as part of a fitness assessment at their organization. However only 42% of the respondents felt that it adequately measured their level of fitness. Survey question #5 identifies that 34.2% of the respondents had punitive consequences as part of the IPAT process. Respondents were not asked to list the punitive actions in the survey. The survey also did not ask what type of IPAT was used or what it consisted of and that is a limitation of the survey. IPATs can vary in type, length, and difficulty, as there is no standard for an IPAT.

Survey question #3 shows that 78.7% of the respondents stated that they have a fit-for-duty physical in their agency. Survey question #5 identified that 36.7% of the respondents had a punitive physician physical in their organization. The punitive actions were not asked in the survey and can be a limitation to interpreting the data. The physical is a NFPA requirement and considered a prerequisite to taking a fitness assessment. Organizations that require a fitness assessment without having a fit-for-duty physical would be non-compliant by NFPA Standards 1500, 1582, and 1583. The purpose of the physical is to identify any medical problems prior to conducting the fitness assessments.

Survey question #4 shows that 64.8% of respondents have an available wellness program in their organization. Survey question #8 shows that 54.5% believe that their wellness program is effective by giving a rating in the response of 3, 4, or 5. Wellness programs can be used to support and prepare firefighters for fitness assessments. These programs teach injury prevention strategies, nutrition, and mental health.

Survey question #6 identifies that 27% of the respondents stated that their fitness and or wellness program were in compliance with NFPA 1582 with 48.3% of the respondents stating they did not know. This percentage does not allow a firm conclusion to the question due to a lack of awareness of the respondents. Survey question #7 shows that 23.6% were compliant with NFPA 1583 again with 49.4% of the respondents stating they did not know. This again does not allow for a firm conclusion of the question due to the lack of awareness of the respondents.

Survey question #9 shows that 79.3% of the respondents believe that an IPAT is either essential or important in evaluating whether or not a firefighter is fit for duty. This shows that the majority of the respondents believe that an IPAT is a valuable tool in assessing fitness levels. The limitation of this survey question is that the term IPAT is not defined and can be delivered in different formats. The conclusion that a fitness assessment is necessary and that task accomplishment should be a part of that assessment is apparent though.

Survey question #10 identifies that 10.2% of the respondent's agencies have had a significant injury or death as a result of a fitness assessment. This percentage shows that even though the majority of the agencies provide a fit-for-duty physical that a significant percentage of firefighters are still experiencing medical problems or injuries while participating in the assessments. The survey question did not ask the type of injury or how the death occurred. This can be a limitation in interpreting the results.

The fourth and final research question asked, “what assessments from other agencies meet NFPA standards?” Procedure #4 identified two assessments that have been identified by the author as meeting the NFPA Standards. These tests will be described in the following paragraphs.

The first fitness assessment to be discussed is from the Phoenix Fire Department (PFD) located in Phoenix, Arizona. The test is accomplished in two parts. The first part occurs during the fit-for-duty physical with oversight by the Department Physician and staff. This portion consists of a body composition test, an aerobic capacity test that is a V02 maximal treadmill test, dynamic and static strength testing, and flexibility testing. The second portion of the test takes place over the course of 12 months when all firefighters participate with their crew in training evolutions to ensure that they have evaluated fire ground task evaluation. These evolutions are administered the Training Division and cover all of the line firefighters.

PFD utilizes a tiered system to determine levels of fitness. Twelve METs is used as a minimum standard for aerobic capacity. They also utilize >30% body fat as a standard to be considered for removal from emergency response and offered rehabilitation. The strength and flexibility testing are compared the previous years and considered for individual improvement according to the department standards (International Association of Firefighters, n.d., p. 4).

The second test that was identified is the fitness assessment from West Metro Fire Rescue (WMFR) located in Lakewood, Colorado. The information obtained regarding WMFR fitness requirements were taken from their website that describes the requirements and process. According www.westmetrofire.org the test is completed in two parts. The first part is the fit-for-duty physical that is conducted with the oversight of the both the Wellness Manager and the Department Physician. This portion is comprised of a VO2 maximal aerobic capacity treadmill

test, strength testing, flexibility testing, and a body composition test. Their program is based off the requirements in NFPA 1583 and the firefighters are held to that standard (West Metro Fire Protection District, n.d., p. 1). The second portion of the fitness assessment is the Physical Ability Test (PAT). This test is similar to the current IPAT at SMFRA. Firefighters are required annually to complete the test. This is timed course with two different events. The course consists of a tower climb, equipment hoist, pulley extension, charged hose line extension, dummy drag, fan carry, and a quarter mile weighted vest run. WMFR considers both tests as part of the fitness assessment with the PAT providing the task completion component as well.

The two assessments identified both meet the NFPA requirements and are delivered in different formats. The fitness assessment from WMFR could be considered more arduous than the PFD fitness assessment, but both gather all of the necessary data and evaluations required by the NFPA Standards.

To summarize the results of this research, it is apparent that the leaders of SMFRA and the survey respondents that fitness assessments and IPATs are an important part of evaluating firefighter fitness levels. Given the two assessments identified as meeting the NFPA Standards this is possible to establish a fitness assessment with or without an IPAT. The assessments can be formatted in different ways to accommodate agency specific goals as well. These conclusions support the NFPA Standards and the pursuit of an NFPA compliant fitness assessment.

## Discussion

The main relationship between the literature review and this paper's results are that although SMFRA offers a fitness assessment it is not a comprehensive assessment when compared to both NFPA 1582 and 1583. Research question #1 asked, "what are the goals and requirements of the NFPA fitness assessments?" The review of these standards identified that

SMFRA will need to adjust its fitness assessment to comply with the NFPA 1582 and 1583. These additions would require specific muscular strength, muscular endurance, and flexibility evaluations be included into the annual fitness assessment (*NFPA*, 2013). In addition to the added evaluations the literature review also identified that SMFRA will need to provide an Authority Physician based medical clearance for each member within 12 months of any fitness assessment given (*NFPA*, 2013). These additions combined with the results of both the interviews and the survey support the need for comprehensive fitness assessments for firefighters.

The literature review also identified that an IPAT format was not required by the NFPA 1582 and 1583 and that it does not meet the specific evaluations for muscle strength and endurance (*NFPA*, 2013). The IPAT however does prove competency in the 13 essential job functions of firefighters (*NFPA*, 2013). This format of test could be used in addition to a fitness assessment for this type of evaluation. Agency objectives can be added to the base requirements of the NFPA 1582 and 1583. These additions should be research based and add value to the fitness assessment.

PFD and WMFR are two agencies that provide fitness assessments to their firefighters in compliance with the NFPA Standards. These two tests varied in format, but both accomplished the objectives of the NFPA Standards and the represented agency. NFPA 1582 and 1583 do offer flexibility and should be considered the minimum industry standard for fitness assessments(*NFPA*, 2013).

I would interpret these results as a good indication that SMFRA is on the right track to have a NFPA compliant fitness assessment and that with or without an IPAT format the test can be comprehensive and have value to the firefighters taking it. These changes will also resolve

the leadership concerns regarding validation of the fitness assessment process. By making these changes the administration is ensuring the compliance with the recognized standards. The leadership can also refer to the guidance provided within the NFPA 1582 and 1583 regarding options for formatting and performance standards.

These changes should have little organizational impact other than the reformatting of the assessment and working with the Authority Physician for any additional requirements and reporting procedures. The firefighters should be presented with the research behind the new testing format and the benefits of compliance with the standards. The compliance with NFPA 1582 and 1583 should provide SMFRA and its firefighters with greater confidence in the assessment and its results. Having this confidence and consistency will hopefully decrease the emotional response and contempt when unfortunate events happen. This new format will not resolve the issue of Workers Compensation coverage in the State of Colorado, but will provide standardization to the process. The insurance coverage issue will need to be addressed at the legislative level of the government.

## Recommendations

It is my recommendation that SMFRA continues to strive to provide comprehensive fitness assessments for its firefighters. The leadership supports providing a valid assessment that ensures the safety of its firefighters and citizens. To attain the validity of the assessment compliance with NFPA Standards is essential.

The changes that are required to be compliant with the standards are listed below. SMFRA would need to change the frequency of fit-for-duty physicals or provide an abbreviated medical clearance conducted by the Authority Physician annually for the firefighters under the age of 40. In addition to this, prior to any portion of the fitness assessment the pre-assessment

procedures need to be completed to ensure a firefighter medical condition has not changed between each portion of the assessment. This applies when portions of the assessment are offered at different intervals of the year. I feel this would allow for a more structured process and potential to prevent medical emergencies and or injuries.

I would also recommend changing the format of the assessment by including the muscle strength evaluation, the muscular endurance evaluation and the flexibility evaluation. This can be accomplished during the fit-for-duty physical or can be provided during an in house evaluation via the Wellness Manager and staff. This would complete the assessment and ensure compliance with the NFPA Standards. These evaluations would provide the firefighter with a historical perspective in these areas and allow for more specific performance improvement.

My final recommendation would be to discontinue the use of an IPAT and adopt an annual task accomplishment system similar to PFD. This system would allow for SMFRA to select the required annual tasks and determine the time frame to accomplish them. This system would be inline with an evaluation of the 13 essential functions of the job identified by the NFPA. These tasks could be delegated down to the Company Officers to complete over the course of one year. This would allow each officer to include these tasks in a low stress environment that could be included in training evolutions to get the added benefit of training. The officer outside of the formal testing setting can apply the same level of accountability. This accountability can include performance improvement plans, rehabilitation, and restriction from emergency response duties.

Recommendations for future researchers would include expanding the survey with more specific questions. This would allow for the researcher to gather more specific information regarding the stakeholder and participants opinions. Specifically expanding the questions on

injuries and death resulting from fitness assessments would be beneficial in identifying the risks of such assessments. Specific questions regarding the content of an agency's IPAT would also be beneficial to the researcher. This would provide a means to determine effective and safe assessment formats. I would also recommend conducting more interviews with wellness and fitness experts from other occupational settings to future researchers. This would give the research a broader perspective and greater potential for positive improvement.

SMFRA is committed to providing a safe working environment for its staff and firefighters. The results and recommendations of this research paper if implemented would validate the SMFRA Fitness Assessment with the recognized industry standards. This in turn would also provide a comprehensive and consistent assessment that would be a good example for any fire service organization

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