

UNIVERSAL PHYSICAL FITNESS TESTING FOR
UNITED STATES GUARDIANS AFLOAT

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MASTER OF MILITARY ART AND SCIENCE
General Studies

by

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The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

PHYSICAL FITNESS TESTING FOR UNITED STATES COAST GUARDIANS AFLOAT, by LCDR Matthew J. Press, 113 pages.

The U.S. Coast Guard does not universally require a periodic physical fitness test. The U.S. Coast Guard continues to struggle with identity, constantly caught between civil and military responsibilities. This conflict extends to physical fitness testing. With the exception of the U.S. Coast Guard, all of the U.S. Armed Forces (Army, Air Force, Marine Corps, and Navy) annually conduct mandatory physical fitness testing. Data from the 2013 *State of the Behavioral Health of the United States Coast Guard* report indicates that at least 8 percent of Guardians do not engage in regular physical activities and are likely metabolically obese normal-weight, better known as skinny fat. The U.S. Government, through the U.S. Department of Health and Human Services, communicates that inactive is unhealthy. Nevertheless, the U.S. Coast Guard has yet to implement a universal physical fitness test. Universal policies, by definition, have broad impacts, and thereby, require an examination. This research methodically examines the impacts on the U.S. Coast Guard Afloat Officer community through a comparison analysis between the U.S. Coast Guard's status quo policy and the implementation of a periodic universal physical fitness test. The study employed data analysis software to add rigor and quantify effects to this subjective evaluation. The findings argue for implementing a periodic universal physical fitness test throughout the U.S. Coast Guard.

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ACRONYMS

BGT	Basic Guardian Tasks
BMI	Body Mass Index
C-GAT	Common - Guardian Afloat Tasks
CAQDAS	Computer Assisted/Aided Qualitative Data Analysis Software
DHS	Department of Homeland Security
DOD	Department of Defense
MDMP	Military Decision Making Process
MONW	Metabolically Obese Normal Weight
NOAA	National Oceanic and Atmospheric Administration
PFT	Physical Fitness Test
PQS	Personnel Qualification Standard
PRT	Physical Readiness Test
pUPFT	periodic Universal Physical Fitness Testing
UPFT	Universal Physical Fitness Testing
USCG	United States Coast Guard
USPHS	United States Public Health Service

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CHAPTER 1

INTRODUCTION

On Aug. 18, 1899, Surfman Rasmus S. Midgett from the Gull Shoal Life-Saving Station, N.C. was conducting a beach patrol on horseback and came upon the barkentine *Priscilla*, which had run aground. Given his distance from the station, he determined to do what he could alone. Immediately, he ran as close to the wreck as he could and shouted instructions for the men to jump overboard one at a time as the waves receded. Obeying his instructions, the sailors leapt overboard. Midgett seized each man and dragged him from the pursuing waves safely to the beach. In this manner, he rescued seven men. There were still three men on board who were too weak to get off the vessel. Midgett went into the water and carried each of them to the beach.

— Stilleke, Commander Steve, ed., “#6, The *Priscilla* Rescue,” in *On Scene*

Gazing at Hodges Soileau’s painting, one sees a vivid image of the altruism and physical wherewithal of the true U.S. Coast Guard (USCG) hero. There is no doubt of the commitment and dedication of today’s Guardians.



Figure 1. The Priscilla Rescue

Source: Commander Steve Stilleke, ed., COMDTPUB P16100.4, "Hodges Soileau's Painting," *On Scene* (Summer 2007): 39, accessed May 28, 2016, <https://www.uscg.mil/hq/cg5/cg534/On%20Scene/OSsummer2007.pdf>.

Does the physical prowess of today's Guardians match those of yesterday?
Should all USCG members maintain this state of physical readiness regardless of their position?

Background

Obesity is sweeping the nation, a phenomenon that brings increased health risk. A quarter of the U.S. population is metabolically obese.¹ Without a mandated periodic physical fitness test (PFT) and reliance only on self-reporting and weight-height measurement, the USCG's mission performance remains susceptible to the "skinny fat"

¹ Anna Bellisari, *The Anthropology of Obesity in the United States* (New York: Routledge, 2016), ch. 5, ch. 6.

trap.² The term skinny fat is used to describe those that by appearance and measurements are in the calculated healthy range, yet have very little muscle. Of the three body types, lean, skinny fat, and strong fat, skinny fat carries the most risk.³

Furthermore, physical fitness can positively influence overall health, longevity, cerebral capacity, and even more abstractly, leadership. Data from the 2013 *State of the Behavioral Health of the United States Coast Guard* report indicates that over 8 percent of the USCG does not engage in physical activity.⁴ This suggests 92 percent do participate in some physical activity, but these numbers are self-reported and considered unreliable. With the exception of the USCG, all U.S. Armed Forces (Army, Air Force, Marine Corps, and Navy) conduct a form of universal Physical Fitness Testing (PFT). Universal policies, by definition, have broad impacts; therefore, the facts above require an examination of the USCG's absence of a periodic PFT.

Research Question

The primary research question for this study is; should the USCG adopt a periodic Universal Physical Fitness Test (pUPFT)? Before addressing the primary question, this

² M. R. Carnethon, P. J. DeChavez, M. L. Biggs, C. E. Lewis, J. S. Pankow, A. G. Bertoni, S. H. Golden, K. Liu, K. J. Makamal, B. Jenkins-Campbell, and A. R. Dyer, "Association of Weight Status with Mortality in Adults with Incident Diabetes," *Journal of American Medical Association* 308, no. 6 (August 8, 2012): 581-590.

³ Alexandra Sifferlin, "When 'Skinny Fat' Is More Dangerous Than Obesity," *Time Magazine*, November 9, 2015, accessed November 9, 2015, <http://time.com/4105095/skinny-fat-obesity/>.

⁴ Mark Mattiko Med USCG, Frances M. Barlas Ph.D., Karen K. Wessels M.A., Jacqueline C. Pflieger Ph.D., and Alisha H. Creel Ph.D., *State of the Behavioral Health of the United States Coast Guard* (Fairfax, VA: ICF International, 2013), accessed May 28, 2016, www.uscg.mil/SAPR/docs/pdf/SoBH_Report_2013.pdf, 34-72.

research identifies the objectives and goals captured in current USCG policies. Therefore, an additional research question is; what are the health goals and objectives for the USCG?

The purpose of this secondary question is to outline the USCG's desired condition. With any action or inaction, there are usually second and third order effects, results that can be traced back to a decision. The importance of capturing all of the impacts is not lost on this study, but the examination of the effects is limited to those impacts that have a clear relationship with the action. Consequently, the effects with clear relationships are captured as criteria. For this reason, another research question is; what criteria, both screening and evaluation, accurately characterize the USCG's desired health ideals?

Assumptions

Patrol schedules and older cutters' configurations will remain the same. Thus, Guardians will have limited opportunities to exercise while their vessel is underway.⁵ The objective is not to identify a fitness policy that fits the USCG today, but one that fits the USCG that of the future and that the public demands. This study assumes that the USCG budget and personnel allocations will remain constant. Implementing a universal fitness test implies creating standards and revising the current USCG fitness program. This paper further assumes testing, if deemed more beneficial than the status quo, will meet the objectives of the test through effective design. Another assumption is that the

⁵ Underway is a USCG term given to Cutters that are away from the pier.

USCG Afloat Community is more apt to require good health based solely on being at sea, with kinematic demands on the body and distance from significant medical assistance.⁶

Limitations

A limitation and barrier to this study is overcoming the influence of service culture; the USCG like most organizations resists change. The USCG culture, in particular the Afloat Community, avoids rules, policies, and orders that specifically dictate requirements. Often, communicated directions and guidance are in terms of desired effects. Vague boundaries allow creativity and ownership of tasks; freedom in interpretation and performance of duties is beneficial in many instances. The U.S. Army calls this concept mission command.⁷ As such, obtaining information on the potential introduction of a requirement was met with hesitation and in some cases resistance.

The author, with limited experience ashore, may have blind spots when correlating the results from an underway perspective to a shore based discipline, where the focus and duties reside in the general realm of staff work. On the other hand, the application of physical fitness standards and testing should be inherently more difficult to implement on an afloat unit as opposed to a shore unit.

Pursuit of quantitative data was limited due to the lack of a centralized USCG database or methodology to capture position-based PFT results. In addition, the USCG

⁶ Paulo M. Alves, Robb Leigh, Ginger Bartos, Rita Mody, Linda Gholson, and Neil Nerwich, "Cardiovascular Events on Board Commercial Maritime Vessels: A Two-Year Review," *International Maritime Health* 62, no. 3 (2010): 137-142. Afloat is the Coast Guard term given to any vessel that is away from the pier.

⁷ Headquarters, Department of the Army, Army Doctrine Reference Publication 6-0, *Mission Command* (Washington, DC: Government Printing Office, May 2012), 2-8.

Personnel Center declined to provide this study the body mass index (BMI) data based on the information's categorization as personal identifiable information. Investigating the relationship between a PFT and BMI data would benefit this research in the ability to validate results through quantifiable means. Analyzing this data by comparing different populations, with respect to time, or even entry fitness results, would add to the benefits of this study. Further recommendations regarding data analysis with extended studies continues in chapter 5.

Furthermore, to assess the culture within the USCG, this research developed a survey which is still awaiting approval (see Appendix A). In similar studies, interviews provided amplifying information.⁸ However, travel during this research was impractical due to funding and subsequent coursework.

Scope and Delimitations

Healthiness is a broad category with elements that touch various fields including emotional, spiritual,⁹ mental, social, and physical; therefore, there are a multitude of factors affecting wellbeing. The scope of this study is limited to the physical aspects of health. The physical aspects include nutrition, sleep, and activity, what the U.S. Army refers to as the performance triad. Nutrition plays an important role in maintaining physical fitness. The U.S. Army nutritionist at Fort Leavenworth, Captain John Dunning,

⁸ S. M. Scovill, T. K. Roberts, and D. J. McCarty, "Health Characteristics of Inland Waterway Merchant Marine Captains and Pilots," *Occupational Medicine* 62, no. 8 (September 16, 2012): 638-641.

⁹ Kenneth L. Pargament and Patrick J. Sweeney, "Building Spiritual Fitness in the Army: an Innovative Approach to a Vital Aspect of Human Development," *American Psychologist* 66, no. 1 (January 2011): 58-64.

recommends, “eating a variety of foods and maintaining adequate energy balance are basic guidelines for a healthy diet.”¹⁰ “Good (healthy) dietary habits greatly enhance your ability to perform at your maximum potential.”¹¹ During the course of research, thirty-six commercial fitness plans were reviewed; of note, each emphasized the importance of nutrition. Several of the fitness plans went further to value nutrition as having the greatest impact on health, up to 70 percent of an individual’s overall health and performance.¹² Although important, nutrition is outside of the scope of this paper and warrants further study for the USCG. Lack of sleep also directly correlates to performance.¹³ In fact, lack of sleep is comparable to alcohol impairment.¹⁴ Once again, sleep is outside of the scope of this paper, yet warrants further study. The Active component of the triad divides into acquiring, training, and maintaining physical fitness. This paper is further refined by physical fitness standards and is limited to testing.

¹⁰ Captain John Dunning, A710-Total Fitness: The Leader’s Mind, Body, and Spirit (Lecture, U.S. Army Command and General Staff College, Fort Leavenworth, KS, February 17, 2016).

¹¹ U.S. Army, “Fueling a Fit Soldier,” accessed May 23, 2016, <https://www.goarmy.com/soldier-life/fitness-and-nutrition/components-of-nutrition.m.html>.

¹² Joachim Lapiak, *Simple Science Fitness* (Joachim Lapiak: April 20, 2015), 35-108.

¹³ The *Coast Guard Health Promotion Manual* mentioned alcohol 128 times, but sleep only twice.

¹⁴ Drew Dawson and Kathryn Reid, “Fatigue, Alcohol and Performance Impairment,” *Nature* 388 (July 17, 1997): 235.

This report focuses on the USCG active duty component of the officers within the Afloat Community. However, extrapolation to all active duty USCG, as well as the reserve component and auxiliary component is likely feasible.

This research is not in pursuit of designing a fitness test or defining particular standards. Although the analysis chapter addresses the effectiveness of the current system, the research focuses solely on determining the best course of action, in other words, to initiate a pUPFT or support the status quo.

Terms

This paper adopts Carl J. Caspersen's delimitation of "physical activity," "exercise," and "physical fitness."¹⁵ These terms and others covered in the glossary require no additional discussion.

Most scholars agree on two reasons for physical fitness testing: performance and health.¹⁶ Other scholars and establishments further divided the two elements into four dimensions, ten fitness domains, or even twelve subgroups. The deduced goals and objectives of the USCG health promotion program highlighting and differentiating between performance-related and health-related outcomes are outlined in chapter 3.

¹⁵ Carl J. Caspersen, Kenneth E. Powell MD, and Gregory M. Christenson Ph.D., "Physical Activity, Exercise, and Physical Fitness: Definition and Distinctions for Health-Related Research," *Public Health Reports* (1985): 126-131.

¹⁶ Top End Sports compiled a comprehensive physical fitness test database, covering over 300 tests. Topend Sports, "All Fitness Tests," Topend Sports Network, accessed May 5, 2016, <http://www.topendsports.com/testing/tests.htm>.

Athletic capability is closely correlated to speed, reaction time, and coordination.¹⁷ For the purpose of this research, the term performance-related is physical action characterized by athletic capability and mission requirements. Health-related, for the purpose of this study, are activities or effects that primarily address components of wellbeing. In particular, health-related physical fitness includes the components of aerobic fitness, muscular strength, endurance, flexibility, and body composition.¹⁸ Design of physical fitness testing normally incorporates elements of both concepts.

Two additional terms meriting further discussion are standards and universal. Although standards in the practical sense usually imply the minimal levels of performance for success, typically, health standards are developed for a range and then scaled.¹⁹ Throughout this paper, the term standards refers to the norm used as a measure.²⁰ The term universal implies that the criterion applies all. Universal is the idea of a standard application across the population and not just a select group. Universal implies the absence of exceptions to include gender, age, or duty. Although the research

¹⁷ The Office of the President's Council on Fitness, Sports and Nutrition, "The President's Challenge," March 13, 2016, accessed May 28, 2016, <https://www.presidentschallenge.org>.

¹⁸ Stephen V. Bowles, James Picano, Ted Epperly, and Stephanie Myer, "The Life Program: A Wellness Approach to Weight Loss," *Journal of Military Medicine* 171, no. 11 (2006): 1089.

¹⁹ Wener K. Hoeger and Sharon A. Hoeger, *Lifetime Physical Fitness and Wellness: A Personalized Program* (Boston, MA: Cengage Learning, 2010), 11-27.

²⁰ Adapted from Google Dictionary, "Standards," Google, accessed May 5, 2016, <http://google-dictionary.so8848.com/meaning?word=standards>.

examined a subset of the USCG population, the study is careful to remain relevant in application to the USCG as a whole.

Finally, when examining organizational physical fitness, the author classified testing into three general categories: entry, periodic, and specific. Entry testing describes initial or entrance exams with the purpose of admitting members into an organization. Periodic testing, as the name suggests, is interval testing normally given annually, semi-annually, or bi-annually. These exams are used to verify that the member upholds the standards set forth to maintain membership in the organization. Specific testing designates exams given to meet particular requirements for an elite position, job, or entry to a unique school within the organization. For the purpose of this study, the researcher only appraised periodic physical fitness testing.

Significance of Study

The study provides scholarly information and assessments on physical fitness testing in order for USCG leadership to justify and make informed decision on the USCG's Health Promotion Program. This study takes an academic approach to develop a comprehensive understanding of why the USCG is without a periodic universal physical fitness test (pUPFT). With the absence of political persuasion or the influence of establishment culture, the results will support either maintaining the status quo or implementing a pUPFT. At a minimum, this research will open the dialogue within the USCG on the advantages and disadvantages of physical fitness testing.

Conclusion

The USCG has a long history of rescues at sea which include selfless physical exertion and confidence that come from extraordinary physical fitness. Moreover, all personnel assigned to cutters play a role in the safety and wellbeing of the ship and crew.²¹ There are basic tasks that any Guardian onboard a ship may be required to perform. For instance, firefighting, combating flooding, and reacting to toxic gas is every cuttermen's responsibility.²² Therefore, USCG tasks are physical and the USCG requires physically fit members.

²¹ Commandant, U.S. Coast Guard, Commandant Instruction (COMDINST) M3502.4, *Cutter Training and Qualification Manual* (Washington, DC: U.S. Department of Transportation and U.S. Coast Guard, 1984), ch. 1.

²² Naval Personnel Development Command, NAVEDTRA 43119-J (CH 1 INCORPORATED), *Personnel Qualification Standard for Damage Control (DC)* (Norfolk, VA: Naval Personnel Development Command, 2014), accessed May 30, 2016, [www.dcfnavymil.org/Library/dcpubs/43119-J%20Damage%20Control%20\(DC\)%20\[1\].pdf](http://www.dcfnavymil.org/Library/dcpubs/43119-J%20Damage%20Control%20(DC)%20[1].pdf).

CHAPTER 2

LITERATURE REVIEW

Officials concluded that a standardized test would be untenable for many of the service's smaller and more remote commands.

— Admiral Paul Zukunft, quoted in Meghann Myers, “Coast Guard scraps proposal for first fitness test,” *Navy Times*

Overview

Reviewing available literature, this chapter addresses the following questions:

1. What is the USCG currently doing to affect physical performance?
2. Why does the USCG not have a pUFPT?
3. What are the advantages of a pUFPT?
4. What are the disadvantages of a pUFPT?
5. Do similar organizations require pUPFT?

What is the U.S. Coast Guard Currently Doing to Affect Physical Performance?

The available literature reviewed regarding the USCG's physical domain is divided into policy, programs, and personnel. Policy is comprised of USCG instructions and manuals. The program literature review covers programs sponsored and endorsed by the USCG. The personnel section entails literature addressing USCG billets and training.

Policy

Commandant Instruction M6200.1C, *Coast Guard Health Promotion Manual*, is the foundational document for USCG physical fitness. With caveats for underway units, the *Coast Guard Health Promotion Manual* states, “Operations and workload permitting,

allow all military members (AD and SELRES) time for exercise and physical activity a minimum of 180 minutes per week during normal working hours. Commands do not have to comply when the unit is on a tropical hours schedule or deployed.”²³ Tropical hours are days in port when liberty is piped early, allowing those without “open brow” privileges to depart the cutter.²⁴ For cutters, in port tropical hours rarely equate to less hours worked.²⁵

Commandant Instruction M1020-8H, *Coast Guard Weight and Body Fat Standards Program Manual*, dictates the requirement for all USCG members to weigh-in semiannually, with the purpose of ensuring “that all Coast Guard military personnel . . . are capable of meeting the organization’s operational needs and challenges.”²⁶ Height and weight measurements do not identify those Guardians who are Metabolically Obese Normal Weight (MONW). MONW, better known as “skinny fat,” is described in chapter

²³ Commandant, U.S. Coast Guard, Commandant Instruction (COMDTINST) M6200.1C, *Coast Guard Health Promotion Manual* (Washington, DC: U.S. Coast Guard, U.S. Department of Homeland Security, July 9, 2015), 4-1 – 4-3.

²⁴ Open brow privileges are given to senior members of the crew allowing them to freely go ashore and conduct personal business at will.

²⁵ U.S. Coast Guard Forum, U.S. Coast Guard, accessed December 21, 2015, <http://www.uscg.org/>.

²⁶ Acting Director of Reserve and Military Personnel, Commandant Instruction M1020-8H, *Coast Guard Weight and Body Fat Standards Program Manual* (Washington, DC: U.S. Coast Guard, U.S. Department of Homeland Security, September 2015), accessed May 30, 2016, https://www.uscg.mil/directives/cim/1000-1999/CIM_1020_8H.pdf, 1-1.

1.²⁷ Thus, the USCG regularly weighs Guardians, but does not assess their true physical fitness.

The Human Resource Directorate (CG-11) promulgates the Health Risk Assessment, a survey taken annually by each USCG member, with questions addressing nutrition, weight management, alcohol, tobacco, cardiovascular risk factors, stress, sleep habits, as well as physical activity.²⁸ However, the datum collected limits the assessment of true health and provides little guidance on performance. Furthermore, protected as personal identifiable information, the strictly controlled Health Risk Assessment provides little feedback to those in authority and is limited as a USCG measure of effectiveness.

The USCG requires law enforcement personnel, boat crew, and rescue swimmers, even at small cutter units, to maintain the applicable physical fitness standards for their positions regardless of the conditions. U.S. Coast Guard Commandant Instruction M16114.30A, *Boat Forces Operations Personnel Qualification Standard*, and U.S. Coast Guard Commandant Instruction M16114.32C, *Boat Operations and Training (BOAT) Manual*, dictate the requirement for boat crew physical fitness testing.²⁹ Commandant Instruction 16134.2D, Subject: The Cutter Surface Swimmer Program, requires cutter

²⁷ Carnethon et al., 581-590.

²⁸ COMDTINST M6200.1C.

²⁹ Commandant, U.S. Coast Guard, Commandant Instruction M16114.30A, *Boat Forces Operations Personnel Qualification Standard* (Washington, DC: U.S. Coast Guard, U.S. Department of Homeland Security, July 2015); Commandant, U.S. Coast Guard; Commandant Instruction M16114.32C, *Boat Operations and Training (BOAT) Manual* (Washington, DC: U.S. Coast Guard, U.S. Department of Homeland Security, January 28, 2013).

rescue swimmers to pass an annual PFT.³⁰ Commandant Instruction, Subject: The U.S. Coast Guard Maritime Law Enforcement Manual (MLEM), requires USCG members serving in a law enforcement status to pass an annual PFT.³¹ All position-based PFTs involve push-ups, sit-ups, and a run. As Stew Smith stated and others confirm, tests of only push-ups, sit-ups, and a run are “good indicators of one’s health, not necessarily an indication of satisfactory job performance.”³² While a pUPFT does not exist, specific positions do have a PFT requirement.

Programs

Services and resources made available to the workforce by the USCG include the Coast Guard Athleticism Program, CG SUPRT Health Coaching, Human Performance Resource Center, and the Fitness Equipment Toolbox.³³ The Coast Guard Athleticism Program was built upon the principles of the National Academy of Sports Medicine and Athletes’ Performance Institute. The Coast Guard Athleticism Program begins at the

³⁰ Commandant, U.S. Coast Guard, Commandant Instruction 16134.2D, Subject: Cutter Surface Swimmer Program, U.S. Coast Guard, U.S. Department of Homeland Security, Washington, DC, June 25, 2015, 5.

³¹ Commandant, U.S. Coast Guard, Commandant Instruction M16247.1, *Maritime Law Enforcement Manual (MLEM)* (Washington, DC: U.S. Coast Guard, U.S. Department of Homeland Security, March 26, 2013), 225.

³² Stew Smith, “Assessing Fitness Test,” Military.com, accessed September 29, 2015, <http://www.military.com/military-fitness/fitness-test-prep/fair-way-to-judge-fitness-test>.

³³ U.S. Coast Guard, “Fitness Equipment Tool Box,” U.S. Department of Homeland Security, accessed May 30, 2016, [http://www.uscg.mil/worklife/docs/pdf/Fitness%20Equipment%20Toolbox%20\(FET\).pdf](http://www.uscg.mil/worklife/docs/pdf/Fitness%20Equipment%20Toolbox%20(FET).pdf).

intermediate stages of training.³⁴ CG SUPRT Health Coaching consists of telephonic coaches who assist members with “overcoming barriers to achieving weight-loss goals through lifestyle changes.”³⁵ The Human Performance Resource Center³⁶ website provides information on a variety of health subjects such as nutrition and exercise. The Fitness Equipment Toolbox simply lists equipment for underway use.³⁷

In the absence of funding, personnel, and political capital, the USCG’s Health Promotion Program office promotes the use of external programs. As endorsed by the USCG’s Health Promotion Program office, the Healthy Living program, the 2008 Physical Activity Guidelines for Americans, the National President’s Challenge, and Shape Up America offered insight into fitness and were consequently referenced. Healthy Living, sponsored by the Centers for Disease Control and Prevention, addressed a variety of topics about attaining a healthy lifestyle.³⁸ The 2008 Physical Activity Guidelines for Americans “provides information and guidance on the types and amounts of physical

³⁴ U.S. Coast Guard, “Office of Work-Life Programs (CG 111) – Coast Guard Athleticism Program,” U.S. Department of Homeland Security, last modified January 12, 2016, accessed May 30, 2016, <http://www.uscg.mil/worklife/cgap/default.asp>.

³⁵ CG SUPRT, Beach Solutions, Inc., accessed May 28, 2016, <http://www.cgsuprt.com>.

³⁶ Human Performance Research Center, accessed May 28, 2016, <http://hprc-online.org/>.

³⁷ U.S. Coast Guard, “Fitness Equipment Tool Box.”

³⁸ Centers for Disease Control and Prevention, “Healthy Living,” U.S. Department of Health and Human Services, accessed May 28, 2016, <http://cdc.gov/healthyLiving>.

activity that provide substantial health benefits.”³⁹ The National President’s Challenge is a “nationwide call to action” which details recommendations for physical fitness.⁴⁰ Finally, Shape Up America by Dr. C. Everett Koop provided information on weight management and physical fitness.⁴¹

Personnel

Education is a primary factor in personnel maintaining healthy and fit lifestyles.⁴² Although education is a highly influential factor, the USCG recanted the requirement for Unit Health Promotion Coordinator training courses, per Commandant, U.S. Coast Guard, ALCOAST 271/10, COMDTNOTE 16010, Subject: Shipmates 2: My Guiding Principles, and Commandant, U.S. Coast Guard, Commandant Instruction M6200.1C, *Coast Guard Health Promotion Manual*. As a result, the USCG eliminated all Health Promotion Manager billets. Health Promotion Managers were the USCG experts in

³⁹ Health.gov, “Physical Activity Guidelines,” Office of Disease Prevention and Health Promotion,” accessed May 30, 2016, <http://www.health.gov/paguidelines/>.

⁴⁰ The Office of the President’s Council on Fitness, Sports and Nutrition.

⁴¹ Shape Up America, accessed May 28, 2016, <http://www.shapeup.org/>.

⁴² Nancy T. Artinian, G. F. Fletcher, D. Mozaffarian, P. Kris-Etherton, L. Van Horn, A. H. Lichtenstein, S. Kumanyika, W. E. Kraus, J. L. Fleg, N. S. Redeker, J. C. Meininger, J. Banks, E. M. Stuart-Shor, B. J. Fletcher, T. D. Miller, S. Hughes, L. T. Braun, L. A. Kopin, K. Berra, L. L. Hayman, L. J. Ewing, P. A. Ades, L. Durstine, N. Houston-Miller, L. E. Burke, “Interventions to Promote Physical Activity and Dietary Lifestyle Changes for Cardiovascular Risk Factor Reduction in Adults: A Scientific Statement from the American Heart Association,” *Circulation*, no. 122 (July 27, 2010): 427.

nutrition and exercise.⁴³ Managers with varying physical fitness background are required to review and advise on subordinates' mandatory fitness plan without any guidance or education. As Paul Casey points out, the unprofessional approach marginalizes physical fitness within the USCG and fosters a "culture of unhealthy and unfit sailors."⁴⁴

Why Does the U.S. Coast Guard Not Have a Periodic Universal Physical Fitness Test?

A review of available literature suggests four reasons the USCG does not have a pUPFT. First, through reporting and policy, the Department of Homeland Security (DHS) does not require physical fitness testing.⁴⁵ Second, "a number of (CG) units" do not have the facilities.⁴⁶ The *Navy Times* quoted the Commandant of the Coast Guard as a proponent of physical fitness routines; however, journalist Meghann Myers further quoted Admiral Zukunft professing that a USCG standardized test is "unattainable."⁴⁷ The institutional rationale for not being able to implement a PFT is based on the operating environment and confined space of the USCG's smaller cutters.⁴⁸

⁴³ Commandant, U.S. Coast Guard, ALCOAST 271/10, COMDTNOTE 16010, Subject: Shipmates 2: My Guiding Principles, U.S. Coast Guard, Washington, DC, May 26, 2010, 1-2; COMDTINST M6200.1C.

⁴⁴ Paul Casey, "Coast Guard Leaders Must Be Accountable for Fitness," *U.S. Naval Institute Proceedings* 130, no. 8 (August 2004): 81.

⁴⁵ Meghann Myers, "Coast Guard scraps proposal for first fitness test," *Navy Times*, March 15, 2015, accessed November 20, 2015, <https://www.navytimes.com/story/military/coast-guard/2015/03/15/coast-guard-cancels-physical-fitness-test/70166988/>.

⁴⁶ *Ibid.*

⁴⁷ *Ibid.*

⁴⁸ Tim Merrell, telephone interview with author, December 17, 2015.

Third, the information provided to the USCG that would prompt a need for measuring physical fitness is incomplete. Although empirical data, BMI with position-based test scores, was not available to this study, the associated rates of the *State of the Behavioral Health of the United States Coast Guard* can infer the skinny-fat population. In line with scholars, the USCG can assume that those who meet BMI standards but do not exercise are skinny-fat and are unlikely to adequately perform common USCG tasks. Interestingly enough, there are noted errors in self-reporting of physical participation rates within the United States. Those that self-report physical fitness tend to exaggerate the intensity level and duration of physical activity by an average factor of 6.9 for men and 5.0 for women.⁴⁹ Therefore, conservatively 15 percent, but up to 25 percent of the Afloat Community maybe “skinny-fat.”⁵⁰

Fourth and final, no available literature particularly challenges the current USCG policy or addresses the issue of USCG periodic physical fitness testing. Without professional discourse on the subject, risk and gaps to the current policy go unnoticed. Only three scholarly documents produced in the last few years particularly addressed USCG physical fitness. The first was an article by Paul Casey titled “Coast Guard Leaders Must Be Accountable for Fitness.” The article discussed leaders not providing members time to engage in physical fitness. The article failed to address root causes, but did provide insight into the overall USCG physical fitness gap. In May of 2015, the

⁴⁹ Ann Lukits, “We Don’t Exercise as Much as We Say,” *The Wall Street Journal*, January 6, 2014.

⁵⁰ A total of 33.2 percent of the USCG did less than moderate fitness in the last 30 days.

Journal of Strength and Conditioning Research published a study conducted at the USCG Academy addressing injury rates. The study helped predict injury rates when initiating a new physical fitness routine. The third employed dietary supplement use data as an index to measure physical fitness levels, in particular, to measure USCG members' participation in aerobic and strength training activities.⁵¹ While the results are interesting, the conclusions drew upon self-reporting data for exercise and body mass index, which this chapter highlighted as inaccurate. Furthermore, the USCG population surveyed was shore based on thirteen installations. Worth noting, the USCG Health and Wellness office conducted physical fitness testing to evaluate functional testing vice the current boat crew position-based test. Several articles confused this evaluation with an effort to explore an all hands PFT.⁵² The USCG Phase One Physical Fitness Test Study, contains results from the evaluation (see Appendix B). This further highlights the need to study the USCG's reliance on the current policy. The *Proceedings of the Marine Safety and Security Council*, the *Coast Guard Journal of Safety at Sea* is published quarterly. *On Scene: The Journal of U.S. Coast Guard Search and Rescue* is published semi-annually. Neither publication addressed pUPFT.

⁵¹ Krista G. Austin, Lorilyn L. Price, Susan M. McGraw, and Harris R. Lieberman, "Predictors of Dietary Supplement Use by U.S. Coast Guard Personnel," *Public Library of Science ONE* 10, no. 7 (2015): 1-15, accessed May 28, 2016, <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0133006>.

⁵² All hands is a USCG term used to represent all members of a group.

What Are the Advantages of a Periodic Universal Physical Fitness Test?

A review of the available literature shows two advantages to implementing periodic physical fitness testing: to promote positive changes in behavior, and to provide quantifiable data for decisions. Testing causes many second and third order effects. However, the simple act of testing produces clear first order effects. Physical fitness testing changes behavior and provides data.

Three distinct positive changes in behavior occur with periodic physical fitness testing. The first is an increase in physical activity. Anouk Middelweerd explains that regular checks and the anticipation of checks on physical fitness increase physical activity.⁵³ The second change is forming positive habits, such as balancing nutrition.⁵⁴ The third positive change is the additional prominence managers place on fitness time and programs. When managers are actively seeking fitness feedback, members are “less self-conscious about taking a fitness break.”⁵⁵

⁵³ Anouk Middelweerd, Julia S. Molle, C. Natalie van der Wal, and Johannes Brug, “Apps to Promote Physical Activity Among Adults: A Review and Content Analysis,” *International Journal of Behavioral Nutrition and Physical Activity* 11, no. 97 (July 25, 2014): 97.

⁵⁴ Ronald C. Plotnikoff Ph.D., Sonia Kippke Ph.D., Steven T. Johnson Ph.D., and Kerry S. Courneya Ph.D., “Physical Activity and Stages of Change: A Longitudinal Test in Types 1 and 2 Diabetes Samples,” *Annals of Behavioral Medicine* 40, no. 2 (October 2010): 138-149.

⁵⁵ Leonard L. Berry, Ann Mirabito, and William Baun, “What’s the Hard Return on Employee Wellness Programs?” *Harvard Business Review* (December 2010): 104-112.

Testing is by definition taking “measurements to check the quality, performance, or reliability of (something).”⁵⁶ These measurements are in the form of measures of effectiveness and measures of performance. Measures of effectiveness check to make certain the “right things are done.”⁵⁷ Physical fitness testing is effective in evaluating fitness and training programs, depicting actual readiness of units and the USCG, and determining USCG-wide gaps in health support. While addressing organizational benefits, Jevon Thompson states, “physical fitness tests assist with establishing a high retention rate and reducing absenteeism.”⁵⁸ Robert Behn talks about measurements as an “overall management strategy . . . to evaluate, control, budget, motivate, promote, celebrate, learn, and improve.”⁵⁹ In addition, physical fitness testing conveys measures of performance. Measures of performance are to verify “things are being done right.”⁶⁰ Physical fitness testing evaluates individual skills, builds confidence, screens for wellness, measures and tracks improvements, identifies strengths and weaknesses, and is at the heart of accountability, both up and down the USCG chain of command.⁶¹ Without

⁵⁶ *Oxford Dictionary*, “Testing,” (New York: Oxford University Press, 2008), 667.

⁵⁷ Director, Joint Staff, Joint Publication (JP) 1-02, *Department of Defense Dictionary of Military and Associated Terms* (Washington, DC: Joint Chiefs of Staff, November 2010, as amended through February 2016), 155.

⁵⁸ Jevon Thompson, “Mandatory Bi-Annual Physical Fitness Testing,” *Law and Order* 61, no. 9 (September 2013): 13.

⁵⁹ Robert D. Behn, “Why Measure Performance? Different Purposes Require Different Measures,” *Public Administration Review* 63, no. 5 (2003): 586-606.

⁶⁰ Director, Joint Staff, JP 1-02, 149.

⁶¹ Casey, 81.

directing periodic fitness standards, verification and therefore accountability of readiness are difficult to assess. A key part of any policy is the accountability piece.⁶² The Gaelic Athletic Association elaborates on the advantages of fitness testing, stating that through the establishment of strengths and weaknesses, training becomes focused and therefore more efficient.⁶³ Steve Bird's work with athletes showed that physical fitness testing increases motivation and competition outside of formal sporting events.⁶⁴

What Are the Disadvantages of a Periodic Universal Physical Fitness Test?

Physical Fitness testing may cause physical harm, cost time, cost money, and may place emphasis on the physical over other desired attributes. Physical fitness tests, like any physical fitness activity, cause injury and even death within a small percentage of the population.⁶⁵ In May of 2015, the *Journal of Strength and Conditioning Research*

⁶² Joseph A. Patricj and John F. Quinn, "The Challenge of Leadership Accountability for Integrity Capacity as a Strategic Asset," *Journal of Business Ethics* 34, no. 3 (December 2001): 331-343.

⁶³ Medical, Scientific and Welfare Committee, Gaelic Athletic Association, "Fitness Test Guide," 2013, accessed May 28, 2016, <http://learning.gaa.ie/sites/default/files/GAA%20Fitness%20Testing%20Guide.pdf>. The Gaelic Athletic Association/Cumann Lúthchleas Gael is a 32-county sporting and cultural organization that has a presence on all five continents.

⁶⁴ Steve Bird, *The Role of Fitness Testing and Selecting and Using Fitness Test*, (Sports Sheet Series, Kent Sports Development Unit, Kent Sport and Physical Activity Service, Kent Coutry Council, Kings Hill, Kent, United Kingdom, n.d.), 1-8.

⁶⁵ Robert E. Eckart DO, Stephanie L. Scoville Ph.D., Charles L. Campbell MD, Eric A. Shry MD, Karl C. Stajduhar MD, Robert N. Potter DVM MPH, Lisa A. Pearse MD MPH, and Renu Virmani, MD, "Sudden Death in Young Adults: A 25-Year Review of Autopsies in Military Recruits," *Annals of Internal Medicine* 141, no. 11 (December 7, 2004): 829-834.

published a study conducted at the USCG Academy addressing injury rates.⁶⁶ The study helped predict injury rates when initiating a new physical fitness routine. Furthermore, test anxiety induces stress resulting in negative physical effects.⁶⁷

Any type of policy change that initiates a program requires money for implementation, as well as funds for sustainment. Also, time factors to consider are tracking, taking an exam, and associated time away from other positive events. In general, physical fitness testing times ranged from forty minutes to two hours with an averaged exam time of eighty-four minutes.⁶⁸ Finally, periodic physical fitness testing would place emphasis on physical characteristics and distract from the development of other desirable attributes. A review of USCG policy for officers entering the service depicts balance between formal education, community service, and physical fitness. Presumably, the introduction of a UPFT could skew the balance toward physical fitness having secondary effects beyond entry-level employees.

⁶⁶ Joseph J. Knapik, Ludimila M. Cosio-Lima, Katy L. Reynolds, and Richard S. Shumway, "Efficacy of Functional Movement Screening for Predicting Injuries in Coast Guard Cadets," *Journal of Strength and Conditioning Research* 29, no. 5 (May 2015): 1157-1162.

⁶⁷ Charles D. Spielberger, *Test Anxiety Inventory* (New York: John Wiley and Sons, 2010), 73-81.

⁶⁸ Roberta E. Rikli and C. Jessie Jones, *Senior Fitness Test Manual* (Champaign, IL: Human Kinetic, January 2001), 24-30; Sport Fitness Advisor, "How to Design a Battery of Physical Fitness Tests," accessed May 30, 2016, <http://www.sport-fitness-advisor.com/physical-fitness-tests.html>; Headquarters, Department of the Army, Field Manual (FM) 7-22, *Army Physical Readiness Training* (Washington, DC: Government Printing Office, October 2012), accessed March 24, 2016, http://armypubs.army.mil/doctrine/DR_pubs/dr_a/pdf/fm7_22.pdf, 5-42.

Do Similar Organizations Require a Periodic Universal Physical Fitness Test?

Many members of the USCG are emergency responders and federal law enforcement officers. The USCG is a sea going service and one of the seven uniformed services. As such, the literature review examined organizations with emergency responders, federal law enforcement officers, merchant mariners, and the uniformed services.

Emergency Responders

All firefighting and police organizations researched for this study had rigorous physical fitness entry requirements with fire departments⁶⁹ mandating annual practical physical fitness exams; however, in general, police forces⁷⁰ did not require annual fitness assessments. Scholars “recommended that fire departments involve appropriately trained staff, schedule on-duty times for exercise, offer well-equipped exercise facilities, and follow the National Strength and Conditioning Association (NSCA) and the American College of Sports Medicine (ACSM) guidelines for exercise conditioning in order to maintain a high degree of physical fitness.”⁷¹

⁶⁹ Julie N. Garver, Kristinez Z. Jankovitz, Jane M. Danks, Ashley A. Fittz, Heather S. Smith, and Steven C. Davis, “Physical Fitness of An Industrial Fire Department,” *Journal of Strength and Conditioning Research* 19, no. 2 (May 2005): 310-317.

⁷⁰ Dave Grossi, “Final Word Mandatory Fitness Standards for In Service-Officers,” *Fitness Health Wellness*, August 1, 2007, accessed May 30, 2016, <https://www.policeone.com/police-products/fitness-health-wellness/articles/1641504-Final-Word-Mandatory-Fitness-Standards-for-In-Service-Officers>.

⁷¹ Garver et al., 311.

Federal Law Enforcement Officers

Of interest, the guidelines above were consistent with the federal law enforcement requirements, U.S. Marshal Service⁷² and Secret Service.⁷³ Note, unions play a strong role in the development of policy and generally oppose additional requirements on members.⁷⁴ Unions often place a high value on not isolating union members, even at the expense of hindering the majority. This may change with the increase in lawsuits targeting law enforcement, as many people cite physical fitness as the cause for poor performance.⁷⁵ By law, the USCG active duty and the select reserves are not unionized. With that said, many law enforcement agencies are working toward a periodic PFT. Most notably the Federal Bureau of Investigation is reintroducing a physical fitness program.⁷⁶

Merchant Mariners

The Code of Federal Regulations are “the general and permanent rules published in the Federal Register by the executive departments and agencies of the federal government. Title 46 Parts 7 and 10 through 16 directly relate to the National Maritime

⁷² U.S. Marshals Service, “Fitness Standards for Men,” U.S. Department of Justice, accessed May 30, 2016, http://www.usmarshals.gov/careers/fitness_men.html.

⁷³ Secret Service, “Physical Fitness Evaluation,” U.S. Department of Homeland Security, accessed May 30, 2016, <http://www.secretservice.gov/join/training/fitness>.

⁷⁴ Way W. Schmidt, ed., “Weight and Fitness Requirements,” *AELE Monthly Journal* 12 (December 2008): 201-207, accessed May 28, 2016, <http://www.aele.org/law/2008ALL12/2008-12MLJ201.pdf>.

⁷⁵ Chip DeBlock, “Unfit officers have greater liability in Use of Force situations,” LEO Affairs, June 11, 2015, accessed May 30, 2016, <http://www.leoaffairs.com/featured/unfit-officers-have-greater-liability-in-use-of-force-situations>.

⁷⁶ *Stars and Stripes*, “FBI returns to fitness tests for agents,” April 7, 2015.

Center and Merchant Mariner Credentialing Program,” charging the USCG with the responsibility of credentialing U.S. merchant mariners. As such, the USCG published medical and physical evaluation guidelines for merchant mariners.⁷⁷ Within this policy, is a requirement for examiners to verify that mariners can complete common vessel tasks. Merchant Mariners Required Tasks, captures the mandatory measures that include (see Appendix C):

- Is able, without assistance, to open and close watertight doors that may weigh up to 55 pounds (25 kilograms). Should be able to move hands/arms to open and close valve wheels in vertical and horizontal directions; rotate wrists to turn handles. Reach above shoulder height.
- Is able, without assistance, to lift at least a 40 pound (18.1 kilogram) load off the ground, and to carry, push or pull the same load.
- Is able, without assistance, to pull an uncharged 1.5 inch diameter, 50’ fire hose with nozzle to full extension, and to lift a charged 1.5 inch diameter fire hose to firefighting position.⁷⁸

While these tasks seem relatively simple, the tasks represent a standard notably not enforced on any USCG personnel.

Uniformed Services

The U.S. Navy, U.S. Air Force, U.S. Army, U.S. Marines, and the USCG, along with the commissioned corps of the U.S. Public Health Service (USPHS) and the commission corps of National Oceanic and Atmospheric Administration (NOAA)

⁷⁷ Commandant, U.S. Coast Guard, Commandant Publication (CMDTPUB) 16700.4, Navigation and Vessel Inspection 04-08, Subject: Medical and Physical Evaluation Guidelines for Merchant Mariner Credentials, U.S. Coast Guard, U.S. Department of Homeland Security, Washington, DC, September 15, 2008, 2.

⁷⁸ Commandant, U.S. Coast Guard, CMDT PUB 16700.4, encl. 2, 3-5.

comprise the uniformed services.⁷⁹ With the exception of the USCG, all of the U.S. Armed Forces require entry, periodic, and specific PFTs. However, few meet the definition of universal as defined in chapter 1.

The USPHS maintains a comprehensive physical fitness program and associated requirements.⁸⁰ As part of the USPHS fitness program, an annual PFT is required, which consists of cardiorespiratory endurance, upper body endurance, core endurance, and flexibility. The USPHS annual fitness standards are captured in *Annual Physical Fitness Test (APFT) Standards and Procedures* (see Appendix D).⁸¹

NOAA physical fitness standards appear to be politically driven. Essentially, NOAA has agreed to follow the USCG requirements or lack thereof.⁸² As of 2004, the NOAA Commissioned Officer Corps suspended the physical readiness test (PRT)

⁷⁹ Commissioned Corps of the U.S. Public Health System, “Commissioned Corps Issuance System: Glossary,” Division of Commissioned Corps Personnel and Readiness, accessed May 5, 2016, <http://dcp.psc.gov/ccmis/ccis/CCISGlossary.aspx>.

⁸⁰ Ibid.

⁸¹ U.S. Public Health Service Commissioned Corps, *Annual Physical Fitness Test (APFT) Standards and Procedures* (Rockville, MD: Division of Commissioned Corps Personnel and Readiness, n.d.), https://dcp.psc.gov/CCMIS/PDF_docs/PHS%20APFT%20Procedures%20&%20Instructions.pdf, 1-20.

⁸² National Oceanic and Atmospheric Administration Commissioned Officer Corps, NOAA Corps Directives, “Career Development and Promotion,” in *Supervisor’s Guide to NOAA Corps Officers*, (Washington, DC: National Oceanic and Atmospheric Administration, last modified June 30, 2014), accessed May 30, 2016, http://www.corpscpc.noaa.gov/procedures/corps_directives/chapter_4/ncd_ch4.pdf, 27-31.

requirement.⁸³ The NOAA Public Affairs office was contacted about this decision, but did not respond.⁸⁴

Policy directs the Department of Defense (DOD) to “maintain physical readiness through appropriate nutrition, health, and fitness habits. Aerobic capacity, muscular strength, muscular endurance, and desirable body fat composition form the basis for the DoD Physical Fitness and Body Fat Programs”⁸⁵ In fact, each service within the DOD is required to report the status of “physical fitness, body fat and health promotion programs” annually to the Assistant Secretary of Defense.⁸⁶ Perhaps this is the driver for an annual physical fitness requirement. Regardless of the driver, the DOD devoted ample research directed at physical fitness.

The U.S. Navy’s Physical Health Assessment “assesses personal physical fitness via a semi-annual Physical Health Assessment (PFA). The PFA includes a medical screen, a body composition assessment (BCA) and a physical readiness test (PRT).” The U.S. Navy’s annual physical readiness test consists of cardio-respiratory fitness, muscular

⁸³ Deputy Director, National Oceanic and Atmospheric Administration Commissioned Officer Corps, NOAA NCA Advisory 0403, Subject: Physical Readiness Test and Body Composition Assessment, National Oceanic and Atmospheric Administration Washington, DC, May 5, 2004, accessed May 30, 2016, http://www.corpscpc.noaa.gov/procedures/advisories/ncadvisory_0403.pdf.

⁸⁴ David L. Hall, email and telephone interview by John Breen Ph.D., May 20, 2016.

⁸⁵ Deputy Secretary of Defense, Department of Defense Directive 1308.1, *DoD Physical Fitness and Body Fat Program* (Washington, DC: Department of Defense, June 30, 2004), 2.

⁸⁶ *Ibid.*

strength, and endurance.⁸⁷ The Navy's annual fitness standards are captured in Chief of Naval Operations Instruction 6110.1J, Subject: Physical Readiness Program.⁸⁸ In January of 2016, the Navy made changes to the PRT.⁸⁹ The changes included separation from service for failing two PRTs in three years, spot checks, nutritional counseling, and fitness awards to those who score outstanding for three consecutive cycles. Even with changes, there are complaints about space and time while underway.⁹⁰

The Grog, a journal of Navy medicine culture and heritage, provided interesting insight into the Navy's development and history of the PRT.⁹¹ Of note, in 1985, the Navy Personnel Research and Development Center conducted a study to "identify a list of common occupational tasks for shipboard personnel."⁹² Furthermore, the USCG

⁸⁷ Office of the Chief of Naval Operations, Chief of Naval Operations Instruction 6110.1J, Subject: Physical Readiness Program, Department of the Navy, Office of the Chief of Naval Operations, Washington, DC, July 11, 2011.

⁸⁸ Ibid.

⁸⁹ Chief of Naval Operations, Naval Administrative Message 178/15, Subject: Physical Readiness Program Policy Changes. Chief of Naval Operations, Washington, DC, August 3, 2015, accessed May 30, 2016, http://www.navy.mil/ah_online/documents/NAVADMIN%20178-15.pdf.

⁹⁰ Stew Smith, "Working Out Underway," *Military.com*, accessed May 30, 2016, <http://www.military.com/military-fitness/workouts/working-out-underway>.

⁹¹ Andre B. Sobocinski, ed., "Mr. Roosevelt and the Origin of the PFT," *The Grog* 7, no. 4 (Fall 2012): 4-8, accessed May 30, 2016, https://issuu.com/thegrogration/docs/the_grog_fall_2012.

⁹² Commander David D. Peterson, MSC USN, "Modernizing the Navy's Physical Readiness Test: Introducing the Navy General Fitness Test and Navy Operational Fitness Test," *The Sport Journal*, July 23, 2015, accessed May 28, 2016, <http://thesportjournal.org/article/modernizing-the-navys-physical-readiness-test-introducing-the-navy-general-fitness-test-and-navy-operational-fitness-test/>.

piggybacks off many Navy programs including physical fitness. As directed by the USCG's Health, Safety and Work-Life Directorate (CG-11), when USCG group training "with a higher ratio of personnel than training equipment," units should use the Navy Operational Fitness and Fueling System, a series of workouts that minimize required gear but still rely on dumbbells, resistance bands, and "any piece of cardiovascular equipment."⁹³

The U.S. Air Force annual physical assessment takes into account three factors: body composition evaluated by an abdominal circumference measurement, aerobic fitness evaluated by a timed 1.5-mile run, and muscular fitness evaluated by the quantity of push-ups and sit-ups completed within one minute. Through the evaluation of the three components, a composite score is determined. U.S. Department of the Air Force, *Fitness Program*, Air Force Instruction 36-2905, contains the U.S. Air Force's physical fitness scoring and standards.⁹⁴ The Air Force literature provided progressive analysis on waist measurements and applicability.⁹⁵

⁹³ Department of the Navy, *Group Physical Training* (Millington, TN: Commander, Navy Installations Command), accessed May 30, 2016, http://www.navyfitness.org/_uploads/docs/NavyGroupSeries.pdf, 8.

⁹⁴ U.S. Department of the Air Force, Air Force Instruction 36-2905, *Fitness Program* (Washington, DC: U.S. Department of the Air Force, October 21, 2013), accessed May 30, 2016, http://static.e-publishing.af.mil/production/1/af_a1/publication/afi36-2905/afi36-2905.pdf.

⁹⁵ Major Richard T. Gindhard Jr., "The Air Force Physical Fitness Program: Is It Adequate?" (Master's thesis, Air University, Maxwell Air Force Base, AL, 1999), 4-5; Steven J. Swiderski, *Fit-to-Fight: Waist vs. Waist/Height Measurements to Determine an Individual's Fitness Level - A Study in Statistical Regression and Analysis* (Wright Patterson AFB: Air Force Institute of Technology, June 2005), 29-58.

The U.S. Army requires various specialized PFTs but also requires all members to take an annual test termed the Army PFT. The Army PFT does not evaluate a member's reaction nor coordination, and therefore the test strongly correlates to health-related not performance-related fitness. Historically the U.S. Army fluctuated between these two concepts as documented by Whitfield B. East.⁹⁶ The U.S. Army, as well as the other U.S. Armed Forces, continues to evolve and struggle with test development. This is evident in the introduction of the U.S Army's "Soldier 2020" and the investigation into the Occupational Physical Assessment Test for entry requirements.⁹⁷ The Army PFT consists of three events: push-ups, sit-ups, and a two-mile run. Alternative aerobic events are available to replace the two-mile run for those with medical conditions. Each event scores the member on a scale of 0 to 100 with a minimum score of 60 in each event to pass the test. The permanently documented score differentiates members for promotion. The U.S. Army's standards are captured on Department of the Army Form 705, the U.S. Army's periodic (annual) PFT score sheet.⁹⁸

Perhaps more than any other organization, the U.S. Marine Corps instills a culture of fitness. Every Marine is annually required to pass a PFT and a Combat Readiness

⁹⁶ Whitfield B. East, *A Historical Review and Analysis of Army Physical Readiness Training and Assessment* (Fort Leavenworth, KS: Combat Studies Institute Press, 2013), 5-19.

⁹⁷ Military Performance Division, U.S. Army Research Institute of Environmental Medicine, USARIEM Technical Report T16-2, *Development of the Occupational Physical Assessment Test (OPAT) for Combat Arms Soldiers* (Natick, MA: U.S. Army Research Institute of Environmental Medicine, October 2015), accessed May 30, 2016, <http://www.defense.gov/Portals/1/Documents/wisr-studies/Army%20-%20MEDCOM%20USARIEM%20Task%20Assessment3.pdf>, 9.

⁹⁸ Headquarters, Department of the Army, FM 7-22, A-18, A-19.

Test.⁹⁹ The PFT consists of three events. “Male Marines will perform dead-hang pull-ups, abdominal crunches, and a 3.0 mile run. Female Marines will complete the flexed-arm hang, abdominal crunches, and a 3.0 mile run.”¹⁰⁰ The CRT also incorporates three events: Movement To Contact, Ammunition Lift, and Maneuver Under Fire. The Combat Readiness Test is a functional fitness test, which evaluates the member’s ability to “perform a broad array of natural or realistic physical work. For Marines, their work involves all the tasks associated with performance in combat.”¹⁰¹ The U.S. Marine Corps’ annual physical fitness standards are in Marine Corps Order 6100.13, Marine Corps Physical Fitness Program.¹⁰²

Marine Corps Order 6100.13 also addresses the idea that leadership centers on physical fitness. In addition, two sequential concepts regarding functional fitness testing emerged from the review of Marine Corps’ literature. The author’s first idea, Basic Guardian Task (BGT) came from Marine Corps Order 1510.121A, Marine Corps Common Skills (MCCS) Program, which presents Marine Corps Common Skills. “Regardless of rank . . . all Marines should possess basic common skills,” identified as Marine Corps Common Skills. For Marines, a portion of these skills translates into an

⁹⁹ Commandant of the Marine Corps, Marine Corps Order (MCO) 6100.13 W/CH 2, Subject: Marine Corps Physical Fitness Program, Department of the Navy, Headquarters U.S. Marine Corps, Washington, DC, January 30, 2015, 1-4.

¹⁰⁰ *Ibid.*, 2-1.

¹⁰¹ Deputy Commandant for Combat Development and Integration, *A Concept of Functional Fitness* (Quantico, VA: Marine Corps Combat Development Command, 2006), 6.

¹⁰² Commandant of the Marine Corps, MCO 6100.13 W/CH2.

annual physical fitness requirement.¹⁰³ Similar thought could implicitly apply to the USCG. BGT is the idea that certain physical tasks are commonly required among all USCG members and require periodic testing. While this idea has merit, the BGT concept was beyond the scope of this paper and left to further research. However, the BGT concept explored for the Afloat Community was conceptually termed by the author as Common-Guardian Afloat Tasks (C-GAT). The second idea, C-GAT, appeared within the Personnel Qualification Standard (PQS) for Damage Control, as well as in the requirements of the commercial merchant mariner credentialing. Clearly, there are common skills for those afloat; unfortunately, the Damage Control PQS for the USCG does not equate to periodic physical fitness requirements. Of note, those underway in the U.S. Army, U.S. Air Force, U.S. Marine Corps, and U.S. Navy are required to maintain their service's physical fitness standards regardless of the size of the vessel.¹⁰⁴

¹⁰³ Commandant of the Marine Corps, Marine Corps Order 1510.121A, Subject: Marine Corps Common Skills (MCCS) Program, Department of the Navy, Headquarters U.S. Marine Corps, Washington, DC, October 1, 2004, 1-5.

¹⁰⁴ The U.S. Army boasts the largest inventory of vessels. Chief of Information, U.S. Navy, "United States Navy: Fact File," U.S. Navy, accessed February 17, 2017, <http://www.navy.mil/navydata/fact.asp>.

CHAPTER 3

RESEARCH METHODOLOGY

I am proposing something that may overtax our complement, but our training forms the habit of endeavoring to accomplish whatever is to be done with the tools that are given us, and our experiences teach us that a task is often less difficult in retrospection than in contemplation.

— Commandant E. P. Bertholf, USRCS,
Letter to Treasury Secretary Franklin MacVeagh

Overview

This research compared two methods for achieving a USCG objective. This academic approach was a comparison analysis of the status quo program as compared to the adoption of a pUPFT. Organized along the ideas laid out by John W. Creswell's *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*, chapter 3, Methodology, contains the research design, the researcher's base, and the data procedures.¹⁰⁵ The research design in this paper introduces the comparison analysis, including discussions on criteria and weighing analysis. This chapter further defines the criteria, both screening and evaluation, which accurately comprise the USCG's desired health ideals. To assess implementing a UPFT, the alternate course of action, the screening criteria is used. This chapter defines and weights the evaluation criteria. This chapter addresses the scoring methodology, but leaves the full discussion on the sensitivity analysis to the end of chapter 4. As highlighted by Lawrence F. Locke, this chapter captures the researcher's base (or commonly referred to as bias). Finally, the

¹⁰⁵ John W. Creswell, *Qualitative Inquiry and Research Design: Choosing Among Five Approaches* (Thousand Oaks, CA: Sage Publications, 2013), ch. 10.

methodology chapter concludes with data procedures, a discussion on data collection, recording, validity, and reliability.¹⁰⁶

Research Design

The basis of this methodology was adapted from the U.S. Army's Military Decision Making Process (MDMP), in particular the course of action comparison.¹⁰⁷ The researcher employed the formula described by MDMP and recognized many courses of action but only compared two in this study. In this instance, the first course of action was to maintain the status quo, and the second course of action was to adopt a pUPFT. Computer Assisted/Aided Qualitative Data Analysis Software (CAQDAS) was employed in an attempt to remove bias and add numerical values to the subjectivity of the study. Prior to starting any analysis, the courses of action were screened for feasibility, acceptability, and suitability. The researcher then ensured that the courses of action were distinguishable.

Screening Criterion

The U.S. Army MDMP provided definitions for each screening criteria.¹⁰⁸ As stated, prior to comparing courses of action, a researcher should screen each course of action for feasibility, acceptability, suitability, and distinguishability. Because the status

¹⁰⁶ Lawrence F. Locke, Waneen W. Spirduso, and Stephen J. Silverman, *Proposals that Work: A Guide for Planning Dissertations and Grant Proposals*, 6th ed. (Thousand Oaks, CA: Sage, 2013).

¹⁰⁷ Center for Army Lessons Learned, Handbook No. 11-19, *MDMP* (Fort Leavenworth, KS: Center for Army Lessons Learned, March 2011), 45-62.

¹⁰⁸ *Ibid.*

quo is already in place, the researcher presumed the status quo met the screening criteria. Therefore, the researcher only vetted the proposed implementation of a UPFT using the screening criteria.

In many respects, feasibility and acceptability go hand in hand. Feasibility is a litmus test to verify that the courses of action are within the organization's established time, space, and resource limitations. In a similar respect, acceptability verifies that the courses of action are within the organization's established balance of cost and risk. For both feasibility and acceptability, the researcher compared the introduction of a UPFT to current USCG programs and similar organizations. The USCG employs a USCG-wide program to annually measure and track BMI. Of note, part of this study will address the cost of deviating from the current conditions. Emergency departments throughout the country are inconsistent in requiring annual physical fitness testing. However, several cities do require periodic fitness testing of their police and fire departments. The existence of emergency departments' annual physical fitness requirements, as well as the majority of uniformed services, validates the feasibility and acceptability of introducing a USCG UPFT.

Suitability, as defined by the MDMP, verifies that the course of action meets the commander's intent. For this screening evaluation element, the author examined leadership speeches. As expected, each leadership speech or discussion that addressed well-being, charged members with forming or losing habits to improve overall health. The author found no evidence in efforts or support to discontinue the current position-based physical fitness testing.

By definition, the two courses of action examined are distinguishable from each other. Under the current physical fitness testing policy, members could potentially pass an entry physical fitness exam and retire after twenty years without taking another PFT as long as they keep their measurements within range. With the introduction of a pUPFT program, all members would take multiple physical fitness exams throughout their career.

Evaluation Criterion

Next, the researcher developed evaluation criteria. Program management and business administration cluster “efforts” into three classifications: people, money, and time.¹⁰⁹ Throughout the literature review, the researcher kept notes on the perceived and implied effects of physical fitness testing and the introduction of standards. The effects were subjectively fit into the business model categories by the researcher. Furthermore, NVivo 11, a data analysis program, facilitated the recording and query of data for themes, allowing the researcher to reassemble the data in illuminating ways.¹¹⁰ NVivo 11 provided a secondary means to verify the author’s derived themes and capture notes. For example, figure 2, NVivo Visual, is a graphic depiction from NVivo of the *Coast Guard Health Promotion Manual*.

¹⁰⁹ Howard Farran, *Uncomplicate Business: All It Takes Is People, Time, and Money* (Austin, TX: Greenleaf Book Group Press, 2015).

¹¹⁰ Raymond V. Padilla, “HyperQual: qualitative data analysis with the Macintosh,” *Qualitative Studies Education* 2, no. 1 (1989): 69-73.



Figure 2. NVivo Visual

Source: Created by author using NVivo.

The five factors comprising evaluation criteria are: Fitness-health, Fitness-performance, Fiscal-implementation, Fiscal-sustainment, and Time. Although logically concluded, ultimately these categories were subjectively determined and note an introduced bias. Just as the literature divided the purpose of physical fitness testing into health and performance, the author divided the effects on people into similar subcategories, health-related and performance-related, as defined in chapter 1. Health-related factors consider the long-term effects, including organizational wellbeing. Performance-related factors center on mission efficiency and effectiveness. Money factors, better termed as fiscal, implies government responsibility not profit driven motives, can be further divided into program start-up cost or implementation, and maintenance cost or sustainment. Time factors appear with no subcategories.

Weight Analysis

Once criteria were established, further investigation determined weighting factors for each evaluation criteria. While the literature review highlighted several USCG policies, documents, and programs that dictate USCG health, the *Coast Guard Health Promotion Manual* is the foundational document for USCG physical fitness. Other sources from which to derive strategic guidance and organization direction are leadership speeches, in particular given by the USCG Commandant. For this study, the author created an NVivo 11 project and loaded the *Coast Guard Health Promotion Manual* and three transcripts of the Coast Guard Commandant's speeches during 2015 into the project.¹¹¹ From the author's notes on effects (word combinations, phrases, and singular words), the researcher created nodes in NVivo 11 correlating to the five evaluation criteria. The program evaluated the project by applying points to each node based on frequency. The run output is provided in NVivo Results with Criteria Nodes (see Appendix E). For illustration, the phrase Proper Range of Motion would credit a single point to the Fitness-health node. In instances where Fiscal appeared in the sentence without associated words, such as New Initiative, the author previewed the occurrence and manually attributed the sentence to the appropriate node. The author recognizes the bias inserted into the process by these subjective adjustments. NVivo 11 tallied the

¹¹¹ Admiral Paul F. Zukunft, "2015 State of the Coast Guard Address" (Speech, U.S. Coast Guard Headquarters, Washington DC, February 24, 2015); Paul Zukunft, Commandant of the Coast Guard, "Challenges Facing the Coast Guard" (Speech, National Press Club, Washington, DC, August 2015); Paul Zukunft, "Coast Guard Academy Graduation All Hands" (Speech, Coast Guard Academy, New London, CT, May 20, 2015).

points, and the researcher normalized each outcome as a percentage of overall occurrence when compared to the other nodes. Table 1 contains the results from the weight analysis.

Table 1. Weighting Matrix		
Evaluation Criteria	Points	Weighting
Fitness-health	267	38.81
Fitness-performance	162	23.54
Fiscal-implementation	78	11.34
Fiscal-sustainment	121	17.59
Time	60	8.72

Source: Created by author using NVivo.

Criteria Analysis

The researcher then examined each course of action against the evaluation criteria using scholarly literature and reviewed the advantages and disadvantages of the first and second order effects. Next the researcher concluded, by scoring the course of action with respect to the evaluation criteria. In other words, the author subjectively performed two assessments for each evaluation criteria: (1) based on the available facts, following the current policy, status quo, has a generally (positive, neutral, or negative) effect on (the evaluation criteria); and (2) based on the available facts, implementing a pUPFT will generally have a (positive, neutral, or negative) effect on (the evaluation criteria).

Based on the data assessed by the author, the score was either positive, neutral, or negative. After scoring and applying the weighting factor, the researcher numerically compared the courses of actions. Afterward, as described at the end of chapter 4, the

study performed a factorial sensitivity analysis employing Microsoft Excel.¹¹² Finally, the author pictorially displayed the results in a balance scale illustration.

Researcher's Base

With any study, in particular qualitative, a researcher's experience and bias influence the outcome. As stated by Locke, "the role of the researcher as the primary data collection instrument necessitates the identification of personal values, assumptions, and biases at the outset of the study."¹¹³ Creswell adds credence to Locke's statement and highlights that personal experiences are not to the detriment of the study, but may add to a study.¹¹⁴

Socially, my childhood formed around sports, influencing the value I place on fitness and the leadership aspects derived from team sports. This viewpoint drove the NVivo 11 analysis and literature review, which depicted the Marine Corps' emphasis on leadership with respect to physical fitness. Through competing in college intramural sports and Reserve Officers' Training Corps Ranger Challenges, I was further influenced to accept the parallels between military service and fitness. This thought process continued during my work with the Air Force, which included the required PFT in Air and Space Basic Course and Squadron Officer School.

¹¹² Andrea Saltelli, Karen Chan, and Marian Scott, *Sensitivity Analysis* (New York: Wiley, 2001), 271-280.

¹¹³ Locke, Spirduso, and Silverman, 50.

¹¹⁴ Creswell, 200.

Within the USCG, my commission required me to complete an initial entry fitness exam per USCG policy. Furthermore, I completed and passed a boat crew and law enforcement PFT based on my assigned duties. While afloat, I personally experienced conditions, facilities, and missions, which did not enable exercise. Mission engagements commonly proceed beyond 72 hours with rough seas. In addition, helicopter operations preclude exercise on the flight deck, one of the few open spaces.

Without clear physical fitness standards, I struggled and was held accountable, through evaluation reports, for the lack of physical fitness of members within my department. On land, I witnessed watch schedules and missions prohibit consistent workout times. My views of fitness were further complicated on land during my role as commanding officer of military personnel which placed me in a position to formally counsel a senior officer, who was also my supervisor, on BMI. This formal counseling ultimately resulted in the officer's forced retirement from the USCG. This study also reflects my sense of fitness as a USCG officer which was challenged by U.S. Army officers while attending Command and General Staff College.

Data Procedures

Data collection in the form of academic studies, leadership speeches, organizational policies, unit instructions, official websites, news articles, and government assessments occurred from September 2015 to March 2016. To ensure relevancy, to capture the knowledge growth in the fitness realm, and to cover the author's USCG experience, literature for analysis focused on the last ten years from 2006 to 2016. The author collected data in notes with both direct results and reflective thoughts on each evaluation criterion. As identified in the literature review, competent sources are

abundant with respect to physical fitness. The analysis used supporting sources for each evaluation criterion, with each course of action evaluated against the same set of literature. To maintain validity and reliability, the collection of resources used to differentiate the courses of action adhered to the concepts of diversely sourced, independently derived, and scholarly concerted data. The author upheld a minimum of three diverse sources to support conclusions; formed from a government sponsor, an academic institute, and civilian research. The references to support deductions independently drew conclusions about the same subject, not referencing each other. Furthermore, to verify the conclusions and increase the reliability of the sources chosen, the supporting documents were only included if referenced by other studies.

CHAPTER 4

ANALYSIS

A physically fit member has a greater chance of successfully meeting physical requirements and higher stress levels in operational and emergency situations.

— Commandant, U.S. Coast Guard, Commandant Instruction M6200.1C, *Coast Guard Health Promotion Manual*

Overview

Following the methodology laid out in chapter 3, the researcher logically and systematically assessed the five evaluation criteria of fitness-health, fitness-performance, fiscal-implementation, fiscal-sustainment, and time. As mentioned, Fitness is further broken down into Health and Performance. Health represents the long-term effects; whereas, performance represents the short-term effects. Fiscal is subdivided into short-term, titled implementation and long-term, titled sustainment. Next, the author assessed the current policy's effect on time and how implementing a pUPFT would affect the USCG's time. Finally, this chapter closes with a sensitivity analysis and a summary of results.

Fitness

Of the three predominant criteria analyzed, the fitness criteria outwardly appeared to favor the introduction of a physical fitness standard. However, underlying issues led to an interesting result. Fitness primarily incorporates performance and health associated with the physical, especially as related to mission performance. Next, this chapter analyzes fitness with the two subcategories of fitness-health and fitness-performance.

Health

The single most important aspect related to implementing a PFT program is the impact on health.¹¹⁵ The literature review revealed three sub-categories for managing health related effects: physical, mental, and organizational.

Periodic physical fitness testing increases fitness activity.¹¹⁶ As a second order effect, UPFT improves physical health. The increase of physical fitness assumed through the implementation of testing would result in lower health risks such as high blood pressure, diabetes, and low back pain.¹¹⁷ In addition, studies point toward a decrease in long-term injuries for those on a routine physical fitness plan.¹¹⁸ Physical fitness testing addresses a variety of issues. As scholars pronounce:

(t)he importance of a fitness assessment is not only to help develop an appropriate, individualized exercise training program, but sometimes also includes screening for risk of heart disease and other chronic diseases. Every fitness assessment should include tests that can measure the five different components of health-related physical fitness, including: body composition, cardiorespiratory fitness, flexibility, muscular strength, and muscular endurance.¹¹⁹

¹¹⁵ Based on the weighting analysis.

¹¹⁶ Middelweerd et al., 97.

¹¹⁷ L. O. Mikkelsen, "Adolescent Flexibility, Endurance Strength, and Physical Activity as Predictors of Adult Tension Neck, Low Back Pain, and Knee Injury: A 25 Year Follow Up Study," *British Journal of Sports Medicine* 40, no. 2 (February 2006): 107-113.

¹¹⁸ Peggie Maniscalco MS, Rebecca Lane MS, Michelle Welke MS, John H. Mitchell MD, Lee Husting Ph.D. MPH, "Decreased Rate of Back Injuries Through a Wellness Program for Offshore Petroleum Employees," *Journal of Occupational and Environmental Medicine* 41, no. 9 (September 1999): 813.

¹¹⁹ Matthew Percia, Shala Davis, and Gregory Dwyer, "Getting a Professional Fitness Assessment," American College of Sports Medicine, January 10, 2012, accessed

The USCG's height and weight standards monitor body composition, a calculated BMI. However, the USCG body measurements do not address aerobic fitness, muscular strength, endurance, and flexibility. Aerobic fitness relates to the "ability of the heart and lungs to deliver blood to muscles."¹²⁰ Muscular strength and endurance relate to core body movements. Flexibility ensures longevity in range of motion.¹²¹ While a very rare occurrence, physical fitness testing has been associated with premature deaths. In contrast, studies attribute physically inactive people as "responsible for one in 10 deaths among U.S. adults."¹²² Therefore, implementation of a physical fitness plan receives a positive score. The status quo does not hinder individuals from pursuing these positive health benefits on their own, and for the purpose of this study scores neutral.

Another second order effect of UPFT is in influencing mental and emotional health. Professional studies connect greater physical and psychological health to positive social relationships.¹²³ In addition, scholars link the benefits of social relationships to

May 30, 2016, <http://acsm.org/public-information/articles/2012/01/10/getting-a-profession-fitness-assessment>.

¹²⁰ Jerrold S. Greenberg, George B. Dintiman, and Barbee Myers Oakes, *Physical Fitness and Wellness: Changing the Way You Look, Feel, and Perform*, 3rd ed. (Champaign, IL: Human Kinetics, 2004), 109.

¹²¹ Paul M. Insel, Thomas D. Fahey, and Walton T. Roth, *Fit and Well: Core Concepts and Labs in Physical Fitness and Wellness Book* (New York: McGraw Hill, 2002), ch. 5.

¹²² Danaei Goodarz, Eric L. Ding, Dariush Mozaffarian, Ben Taylor, Jurgen Rehm, Christopher J. L. Murray, and Majid Ezaati, "The Preventable Causes of Death in the United States: Comparative Risk Assessment of Dietary, Lifestyle, and Metabolic Risk Factors," *Public Library of Science Medical Journal* 6, no. 4 (April 28, 2009): 59.

¹²³ Stephen G. Post, "Altruism, Happiness, and Health: It's Good to be Good," *International Journal of Behavioral Medicine* 12, no. 2 (June 2005): 66-77.

reduced anxiety, reduced blood pressure, stronger immune systems, and longer life.¹²⁴ The benefits of social relations are well founded. These individual benefits produced healthier workers with less pessimism, more hopeful and goal-oriented thinking, greater openness to new experiences, and generally higher job satisfaction.¹²⁵ In fact, workers reported less depression, anxiety, or irritability and less workdays missed due to illness.¹²⁶ Nearly all organizations rely on positive social relations for an exchange of support, information, advice, praise, and opportunities.¹²⁷ Although physical fitness is one of many stress management tools, additional requirements generate additional stress factors. In addition, test anxiety is a real phenomenon.¹²⁸ Moreover, requiring a test would have varying results on confidence. This criterion is neutral for status quo but positive for implementing a UPFT.

Another long-term effect of UPFT is the overall influence on the organization. A focus area for PFT research centers on force structure and development. With modern society's preponderance of obesity and inactivity, only one-third of the U.S. population is

¹²⁴ Ed Diener and Robert Biswas-Diener, *The Science of Optimal Happiness* (Boston, MA: Blackwell Publishing, 2008), 18-25.

¹²⁵ Shelly L. Gable, Gian C. Gonzaga, and Amy Strachman, "Will You Be There for Me When Things Go Right? Supportive Responses to Positive Event Disclosures," *Journal of Personality and Social Psychology* 91, no. 5 (2006): 904-917.

¹²⁶ Sonja Lyubomirsky, *The How of Happiness* (New York: Penguin Press, 2008), 157-161.

¹²⁷ Christopher Peterson, *A Primer in Positive Psychology* (Bethesda, MD: Oxford University Press, July 2006), 255.

¹²⁸ Spielberg, 73-81.

eligible for military service.¹²⁹ In fact, “27 percent of young Americans are too overweight to join the military.”¹³⁰ While there are many influencing factors prohibiting people from qualifying for military service, a major factor is lack of physical fitness. Even though entry fitness requirements are not within this study, the decrease in general U.S. population fitness levels equates to a higher dismissal rate based on fitness testing.¹³¹

Highly technical companies value innovation and intelligence; therefore, their employees tend to have these qualities more often than physical fitness. Therefore, periodic physical fitness testing would place emphasis on physical characteristics and distract from the development of other desirable attributes. A review of USCG policy for entering officers depicts balance between formal education, community service, and physical fitness. Presumably, the introduction of a UPFT could skew the balance toward physical fitness.

¹²⁹ Blake Stilwell, “Here’s Why Most Americans Can’t Join the Military,” *We Are the Mighty*, September 28, 2015.

¹³⁰ Beth J. Asch, Christopher Buck, Jacob Alex Klerman, Meredith Kleykamp, and David S. Loughran, *Military Enlistment of Hispanic Youth: Obstacles and Opportunities* (Santa Monica, CA: RAND Corporation, May 2009), accessed May 28, 2016, <http://www.rand.org/pubs/monographs/MG773.html>, 63.

¹³¹ Mission Readiness, *Young Virginians: Ready, Willing, And Unable To Serve*, (Washington, DC: Mission Readiness, May 14, 2009), accessed May 28, 2016, https://www.missionreadiness.org/wp-content/uploads/VA_Early_Ed_Report.pdf, 1-5.

Within the continuum of sick, well, and healthy, incentivized physical fitness regimens led to fewer workdays missed.¹³² On the other hand, injuries related to physical activity within the military “are the leading cause of medical disability and limit combat readiness.”¹³³ The combination of these factors for organizational effect, rated the implementation of a UPFT as overall negative. The status quo could project a support of the cultural misgivings that physical fitness is unimportant. With current U.S. trends, USCG workforce obesity issues will continue to compound regardless of testing. Therefore, the current program of no PFT scored neutral.

Table 2. Fitness-Health Matrix		
Evaluation	Status Quo	Universal Physical Fitness Test
Physical	0	+
Mental	0	+
Organization	0	-
Total	0	+

Source: Created by author using information from Headquarters, Department of the Army, Army Doctrine Reference Publication 6-0, *Mission Command* (Washington DC: Government Printing Office, May 2012), 2-8.

¹³² Steven G. Aldana, Ray M. Merrill, Kristine Price, Aaron Hardy, and Ron Hager, “Financial Impact of a Comprehensive Multisite Workplace Health Promotion Program,” *Preventive Medicine* 40, no. 2 (February 2005): 131-137.

¹³³ Kenneth L. Cameron and Brett D. Owen, eds., “Overcoming Barriers to Injury Prevention in the Military,” in *Musculoskeletal Injuries in the Military*, eds. Deydre S. Teyhen, Stephen L. Goffar, Timothy L. Pendergrass, Scott W. Shaffer, and Nikki Butler (New York: Springer-Verlag, 2015), 287.

Performance

The USCG has a long history of rescues at sea which include selfless physical exertion and confidence that come from extraordinary physical fitness. Moreover, all personnel assigned to cutters play a role in the safety and wellbeing of the ship and crew.¹³⁴ As explained, there are basic tasks that any Guardian onboard a ship may be required to perform.¹³⁵ As discussed in chapter 1, performance-related fitness is “linked to athletic performance . . . speed, reaction time, and coordination.”¹³⁶ The study examined the effect of physical fitness on performance through three lenses: physical, mental, and leadership.

Physical

Increased physical fitness, as stated, will increase physical performance; however, with any significant population, the increase in physical activity, to include requiring an annual PFT, will cause short-term injury rates to increase.¹³⁷ These injury rates typically plateau and normalize within the population. Data have also shown that the higher the level of fitness in an individual, the less likely a new program will impact their injury

¹³⁴ Commandant, U.S. Coast Guard, COMDINST M3502.4.

¹³⁵ Naval Personnel Development Command, NAVEDTRA 43119-J (CH 1 INCORPORATED).

¹³⁶ UNL Food, “Adult Fitness Test,” Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln, accessed May 30, 2016.

¹³⁷ Bruce H. Jones, Matthew W. Bovee, John McA Harris III, and David N. Cowan, “Intrinsic Risk Factors for Exercise-Related Injuries Among Male and Female Army Trainees,” *American Journal of Sports Medicine* 21, no. 5 (September 1993): 705-710.

rate, to a point that those termed very active exhibit a negligible increase in injuries.¹³⁸ Another point, the PFT prescribed often leads to particular reoccurring injuries.¹³⁹ For example, if a prescribed test requires push-ups, one could expect an increase in wrist and elbow injuries. Once again, many factors of success are a reflection of the test development. Overall studies show that the physical performance benefits outweigh any increase in injuries.¹⁴⁰ Therefore, requiring a pUPFT is advantageous for increasing, or at least maintaining, physical performance. The USCG curtails many of the risk factors for performance failure with position-based fitness testing, which is already in place. However, without screening for MONW, a portion of the USCG population will likely fail to adequately perform basic Guardian tasks. Without standards for basic or common Guardian tasks, as defined in chapter 2, the USCG retains a significant performance risk. Therefore, the status quo is holistically detrimental to physical performance and receives a negative score.

¹³⁸ Ludmila M. Cosio-Lima, Katy L. Reynolds, Joseph J. Knapik, Richard S. Shumway, and Irwin Whitney, "U.S. Coast Guard Academy Injury and Risk Factor Study," *British Journal of Medicine and Medical Research* 3, no. 4 (2013): 926-927.

¹³⁹ Lars Rosendal MSc, Henning Langberg MSc, Ph.D., Arne Skov-Jensen MD, and Michael Kjaer MD, Ph.D., "Incidence of Injury and Physical Performance Adaptations During Military Training," *Clinical Journal of Sport Medicine* 13, no. 3 (May 2003): 157-163.

¹⁴⁰ Katarina Melzer, Bengt Kayser, and Claude Pichard, "Physical Activity: The Health Benefits Outweigh the Risks," *Current Opinion in Clinical Nutrition and Metabolic Care* 7, no. 6 (November 2004): 642.

Mental

The mental association with physical movement is only recently understood. Increasing movement increases one's mental acuity, including the performance factors of confidence and decisiveness.¹⁴¹ Although the results vary, multiple studies have concluded that there are direct mental and emotional benefits from a physical fitness routine. Overall, evidence points toward an increase in mental faculties with regular physical exercise. Short- and long-term effects of physical fitness include an increased memory and other cognitive skills.¹⁴² Introducing a PFT will benefit one's mental performance; however, there is no definitive answer as to whether the status quo induces or hinders mental performance. For scoring mental capacity as related to fitness performance, status quo is neutral, and the adoption of a pUPFT is positive.

Leadership

Physical fitness literature associates leadership ability and leadership relationships with performance. As discussed in chapter 2, the U.S. Marine Corps, the U.S. Army, and to a lesser degree the USCG, tie leadership directly to physical fitness performance. It is more accurate to associate competency to leadership. Physical fitness requires self-discipline and other characteristics, which manifest as positive traits among leaders.

¹⁴¹ Carlyle H. Folkins and Wesley E. Sime, "Physical Fitness Training and Mental Health," *American Psychologist* 36, no. 4 (April 1981): 373-389.

¹⁴² Silvia DiLoreto, "Regular and moderate exercise initiated in middle age prevents age-related amyloidogenesis and preserves synaptic and neuroprotective signaling in mouse brain cortex," *Experimental Gerontology* 57 (September 2014): 64; Fernando Gomez-Pinilla and Charles Hillman, "The Influence of Exercise on Cognitive Abilities," *Comprehensive Physiology* 3 (January 2013): 403.

However, these same leadership traits, for example self-discipline and resiliency, proliferate in other sedentary activities, such as video games and academia, where people exert competency and skill. The proponents of connecting physical fitness to leadership often use team sports as evidence to support superior communication skills.¹⁴³ The study of cooperative video gamers and influential communication debunks this misconception.¹⁴⁴ Cooperative video games require judgement and high levels of communication with effective teams being rewarded success, and in turn, leadership is developed. This is not to dismiss the importance of leadership development in physical activities, but to highlight the fact that leadership development is independent of physical fitness.

The fact that competency overrides physical fitness is even more evident within the cutter community; the seamanship of a captain outweighs almost all other traits. Therefore, the development of leadership traits does not influence the scoring criterion. On the other hand, accountability influences the leader-subordinate relationship, in particular with performance. Leadership studies document the relationship between responsibility, authority, and accountability.¹⁴⁵ A strained relationship exists when the feedback loop of accountability is absent or inadequate. In addition, without clear

¹⁴³ Mandayam O. Thirunarayanan and Manuel Vilchez, "Life Skills Developed by Those Who Have Played in Video Game Tournaments," *Interdisciplinary Journal of Information, Knowledge, and Management* 7 (July 2012): 206.

¹⁴⁴ James P. Gee, "Are video games good for learning?" *Curriculum Leadership: An Electronic Journal for Leaders in Education* 5, no. 17 (2007): 1-6.

¹⁴⁵ Patricj and Quinn, 342.

standards of performance, the relationship is further strained.¹⁴⁶ Authority, responsibility, and accountability must balance with each tasking; when one element is missing or lacking, the relationship is not efficient and can stall. As President Ronald Reagan is famously quoted, “Trust, but verify.”¹⁴⁷ Verification is important for healthy professional relationships.¹⁴⁸ Without a mandated universal standard and with the absence of physical fitness testing or a measure of performance, the USCG will perpetuate this strained relationship between supervisor and subordinate. Exerting a responsibility without a feedback mechanism is detrimental to command relations. Therefore, the status quo equates to a negative effect on leadership, whereas UPFT remains neutral.

Table 3. Fitness-Performance Matrix		
Evaluation	Status Quo	Universal Physical Fitness Test
Physical	-	+
Mental	0	+
Leadership	-	0
Overall	-	+

Source: Created by author using information from Headquarters, Department of the Army, Army Doctrine Reference Publication 6-0, *Mission Command* (Washington DC: Government Printing Office, May 2012), 2-8.

¹⁴⁶ Adapted from Marion E. Haynes, *There’s More to It Than Letting Someone Else Do It!* (New York: American Management Association, January 1980), 97.

¹⁴⁷ David E. Hoffman, *The Dead Hand: The Untold Story of the Cold War Arms Race and Its Dangerous Legacy* (New York: Doubleday, 2009), 298. Quoting a Russian proverb “Доверяй но Проверяй.”

¹⁴⁸ John A. Ledingham, “Government-Community Relationships: Extending the Relational Theory of Public Relations,” *Public Relations Review* 27, no. 3 (2001): 285.

Fiscal

With any study, especially in today's political environment, researchers must consider and examine the fiscal cost. With governmental resources constrained and under increased scrutiny, one must start by verifying the acceptability of expending any funds on a new program. Furthermore, the researcher should evaluate and compare the fiscal impacts to the initiative's benefits as part of an evaluation criterion.

Implementation

For adopting a new PFT, there are three fiscal factors to consider. The first is standards and test development, the second is facility cost, and the third is equipment cost. As expressed in USCG leadership speeches, the USCG budget is strained, and there is a call to "steady the service" by reducing the new initiatives.¹⁴⁹ In addition, there are ethical arguments for affecting long-term quality of life regardless of cost. This controversial argument would negate any fiscal criterion. However, money is considered finite and a criterion for this study. Test development is an important part of any PFT initiative. Simply adopting or modifying another agency's test is a relatively inexpensive employment method. Developing a fitness test from scratch will cost the USCG millions of dollars. Regardless, the implementation of a test will come at a price. General Services Administration offered detailed information regarding fitness facilities and federal requirements. In addition to the initial costs associated with the construction, equipment costs related to creating routines and standards are the next greatest expense. Although

¹⁴⁹ ALCOAST 271/10, COMDTNOTE 16010, 1. Admiral Papp still echoes throughout the USCG.

clearly out for profit, Gym Starters and Gym Source provided detailed cost estimates for equipping fitness centers. For a population of 500 members, fitness equipment costs range from \$50,000 to \$100,000; however, this cost per person estimate would rise with small isolated units.¹⁵⁰ Shore side facilities would require some modification to absorb the additional maintenance requirements by introducing fitness capabilities onboard cutters. The current USCG fleet would require updates and modifications to incorporate space to meet standards and testing. At a minimum, facilities would require additional storage to accommodate the fitness equipment and test material. Concerning fiscal-implementation, there is only one effect, a negative effect on adopting a UPFT. For this reason, the status quo's score is neutral and the UPFT score is negative.

Table 4. Fiscal-Implementation Matrix		
Evaluation	Status Quo	Universal Physical Fitness Test
Equipment	0	-
Facilities	0	-
Total	0	-

Source: Created by author using information from Headquarters, Department of the Army, Army Doctrine Reference Publication 6-0, *Mission Command* (Washington DC: Government Printing Office, May 2012), 2-8.

¹⁵⁰ William C. Grantham, *Health Fitness Management: A Comprehensive Resource for Managing and Operating Programs and Facilities* (Champaign, IL: Human Kinetics Publisher, 1998), ch. 12; U.S. General Services Administration eLibrary, "Contractor Listing: Fitness Equipment," U.S. General Services Administration, accessed April 8, 2016, <https://www.gsaelibrary.gsa.gov/ElibMain/sinDetails.do?executeQuery=YES&scheduleNumber=78&flag=&filter=&specialItemNumber=192+08>.

Sustainment

Upkeep of any new system or capacity requires additional maintenance. Fiscal factors, with associated costs and savings that reoccur in literature are healthcare, educational programs, equipment, and facilities. Of these factors, healthcare dominates the professional discussion.

As alluded to in the performance and mental metrics, the long-term health costs would exhibit savings. However, most studies conclude that due to the “large variation in the individual cost, the differences between exercisers and non-exercisers were not statistically significant.”¹⁵¹ One study of white-collar workers determined “the average combined savings per participant were \$353.38; the average operational cost was \$120.60. Results suggest that worksite wellness programs can make a substantial contribution to the reduction of health care and disability costs”¹⁵² Of note, this study included those with a mean age of 50, well above the average USCG active duty age. Another caveat not considered in civilian studies is lifetime healthcare, which the USCG provides to retired members. The medical studies examined concluded that longevity of personnel is increasing; however, lifetime health cost remains the same. Grounded on the

¹⁵¹ William B. Baun MS, Edward J. Bemacki MD, MPH, and Shan P. Tsai Ph.D., “A Preliminary Investigation: Effect of a Corporate Fitness Program on Absenteeism and Health Care Cost,” *Journal of Occupational and Environmental Medicine* 2, no. 1 (January 1986): 18.

¹⁵² Donald W. Bowne MD, Michael L. Russell Ph.D., Julia L. Morgan MA, Scott A. Optenburg, RN, MPH, Dr.P.H., Ann E. Clarke MD, “Reduced Disability and Health Care Costs in an Industrial Fitness Program,” *Journal of Occupational and Environmental Medicine* 26, no. 11 (November 1984): 809.

literature examined, the author concluded that healthcare costs and savings in the long-term would not change based on testing.

With respect to other cost factors, Max Heirich makes two key points, “ongoing outreach to enlist employees in various types of exercise programs is more effective than the presence of fitness facilities without such outreach. Moreover, significant increases in frequency of exercise can be sustained without a substantial investment in (equipment and) facilities.”¹⁵³ The first point is educational programs are important. The cost of educational programs varies, but ultimately implementing a periodic fitness test would require additional training that would incur a cost. The second point is equipment and facilities are required for a fitness program, but do not need to be elaborate for a PFT. Again, the cost may not be exorbitant, but implementing a periodic PFT would require additional costs devoted to facilities and equipment.

The current policy does not affect the long-term budget. Therefore, the status quo course of action receives a neutral score. Although the USCG can mitigate cost, eventually implementing a periodic PFT would result in an increase in long-term cost. Therefore, the adoption of a pUPFT receives a negative score. The fiscal factors support the status quo course of action.

¹⁵³ Max A. Heirich Ph.D., Andrea Foote Ph.D., John C. Erfurt AB, and Barbara Konopka, Ph.D., “Work-Site Physical Fitness Programs: Comparing the Impact of Different Program Designs on Cardiovascular Risks,” *Journal of Occupational Medicine* 35, no. 5 (May 1993): 510.

Table 5. Fiscal-Sustainment Matrix		
Evaluation	Status Quo	Universal Physical Fitness Test
Total	0	-

Source: Created by author using information from Headquarters, Department of the Army, Army Doctrine Reference Publication 6-0, *Mission Command* (Washington DC: Government Printing Office, May 2012), 2-8.

Time

Time can be an independent variable or merged with the analysis of other criteria but must be incorporated to capture the effects of both the status quo and the introduction of a periodic PFT. Time factors to consider are taking the exam, tracking, and associated time away from other productive actions. In general, the average physical fitness testing time is eighty-four minutes.¹⁵⁴ Tracking of a physical fitness testing requires approximately one minute and fifty seconds per person including, set-up of test, recording test scores, and data entry.¹⁵⁵ For the USCG, this equates to an administrative time cost of approximately one thousand hours plus additional management and oversight time. With the current policy of 180 minutes per week allowed per person, presumably no additional time cost would be required for physical activity. However, with the implementation of a test, more members would take advantage of this allotted time. One of the most difficult items to quantify is the increase in efficiency. As explained above,

¹⁵⁴ Rikli and Jones, 24-30; Headquarters, Department of the Army, FM 7-22, ch. 5, 42.

¹⁵⁵ This number is based on a one-hour set-up time for testing 45 individuals with an additional one minute for tracking and five to ten seconds per person for data entry.

improved physical fitness directly correlates to improved mental and physical task efficiencies. While the organization will realize efficiencies with the implementation of a pUPFT, overall the administrative and associated workout period will consume time. The current policy does not inhibit gained efficiencies through physical fitness. Therefore, the status quo course of action receives a neutral score. Implementation of a periodic PFT will result in an administrative time increase. Therefore, the adoption of a pUPFT receives a negative score. The time criterion supports the status quo course of action.

Table 6. Time Matrix		
Evaluation	Status Quo	Universal Physical Fitness Test
Total	0	-

Source: Created by author using information from Headquarters, Department of the Army, Army Doctrine Reference Publication 6-0, *Mission Command* (Washington DC: Government Printing Office, May 2012), 2-8.

Sensitivity

Using procedures found in the *Sensitivity Analysis* textbook by Andrea Saltelli, Karen Chan, and Marian Scott, a sensitivity analysis was performed on the results to determine the impact of variabilities and test for robustness in the presence of the author's bias.¹⁵⁶ For calculations, the author employed Microsoft Excel. Next, the researcher addresses sensitivity within the criteria's weighting and scoring.

¹⁵⁶ Saltelli, Chan, and Scott, 271-280.

Weighting

The author first examined the weighting given to each evaluation criteria. The evaluation criteria fitness-health would require a weighting decrease by a factor of 0.64, over half, to alter the results. The weighting on fitness-performance had no appreciable influence on the outcome, because the weighting would require a decrease in value greater than the total weighted value. Fiscal-implementation, fiscal-sustainment, and time would require increases by factors of 2.18, 1.40, and 2.83 respectively. All weighting values applied to the criteria which favored the status quo course of action were greater than one, in other words, the weighting values of fiscal and time would need to more than double to change the overall outcome. These results were sufficient to determine the robustness of weighting values.

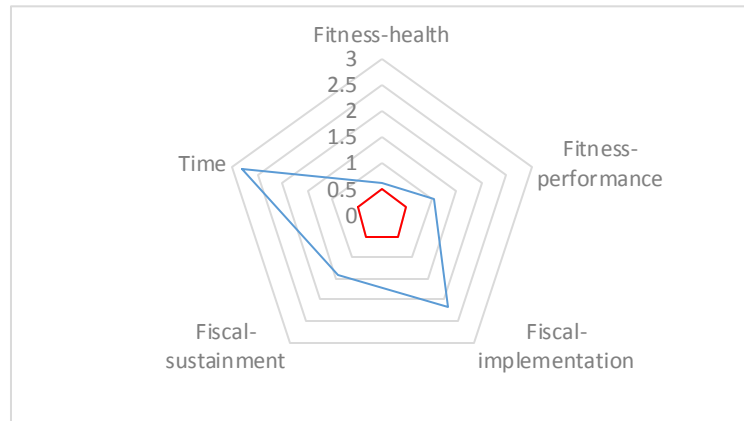


Figure 3. Weighting Sensitivity

Source: Created by author.

Scoring

Finally, to determine the influence of the scores applied to each evaluation criterion, the author varied each outcome (negative, neutral, or positive) by one iteration holding all other scores and weighting constant. Negative was quantified by -1, neutral by 0, and positive by +1; allowing a range between -1 and 1 resulting in a max differential of 2. Total scores were cumulative based on subcategories. For fitness-performance, fiscal-implementation, fiscal-sustainment, and time, to include all sub-elements, single score variations did not change the overall outcome.

With weighting applied to the cumulative totals, single score variation within the evaluation criteria of fitness-health did not change the overall results. However, when applying weighting in an all or nothing fashion and allowing tie scores to nullify an evaluation criteria, the evaluation criteria of fitness-health would change the overall results. For this reason, the author re-examined the literature applied to fitness-health. Although the scoring of fitness-health warrants queries, the strength of the argument favors the findings.

Results

Overall, the results endorse the implementation of a pUPFT. The fitness-health and fitness-performance criteria support the implementation of a UPFT. The fiscal-implementation, fiscal-sustainment, and time criteria favor the status quo.

Fitness-health, based on the literature and analysis, earned a significant weighting factor. The sensitivity analysis confirmed the potential impact of the high weighting given to fitness-health. The sensitivity analysis then drove a reexamination of the fitness-health scoring. In the end, the scoring of fitness-health still supported a periodic PFT. The

physical and mental assessment of fitness-health revealed long-term benefits to Guardians. In particular, periodic physical fitness testing would lead to a decrease in injuries and improved cardiovascular health. With respect to mental, the results of testing would improve emotional outlook and lead to goal-oriented thinkers and a greater openness to new experiences. In contrast, the effect on organizational health would tilt the population toward physical attributes and away from other desirable traits. Regardless, the overall fitness-health supported the implementation of a pUPFT.

Fitness-performance also supported the adoption of a pUPFT. The physical aspect of fitness-performance with the introduction of a fitness test showed an increase in speed, reaction time, and coordination. The mental facet of fitness-performance also proved the merits of introducing a PFT through the increase in memory and other cognitive skills. Leadership with respect to fitness-performance influenced the results toward implementing a periodic PFT through accountability and the positive impact on leader-subordinate relationships.

Fiscal, in both implementation and sustainment, clearly favored the status quo. The introduction of a PFT would require budget allocations for test development, facility upgrades, and equipment purchases. While some aspects of healthcare costs may decline, the overall healthcare cost would not substantially change. In fact, to maintain a viable PFT program, upkeep cost with education, equipment, and facilities would be required. The fiscal criterion supports the status quo.

Time also favored staying with the current policy. The associated administrative time and the additional time members would spend on preparing for a PFT lead to the support of the status quo course of action.

Although the weighting criteria called for a reexamination of the fitness-health criteria, all other factors point toward a robust evaluation. The author recognizes the subjectivity of the analysis. To quantify the results, the findings favor the introduction of a UPFT 62 percent to 38 percent.

Table 7. Final Decision Matrix			
Evaluation Criteria	Weighting	Status Quo	Universal Physical Fitness Test
Fitness-health	38.81	0	38.81
Fitness-performance	23.54	0	23.54
Fiscal-implementation	11.34	11.34	0
Fiscal-sustainment	17.59	17.59	0
Time	8.72	8.72	0
Overall		37.65	62.35

Source: Created by author using information from Headquarters, Department of the Army, Army Doctrine Reference Publication 6-0, *Mission Command* (Washington DC: Government Printing Office, May 2012), 2-8.

In summary, the author illustrated the results through a balance scale. Figure 4 depicts the importance the USCG places on Guardians' wellbeing. The figure also shows the resources of money and time. People, money, and time must be balanced with the introduction of any policy.

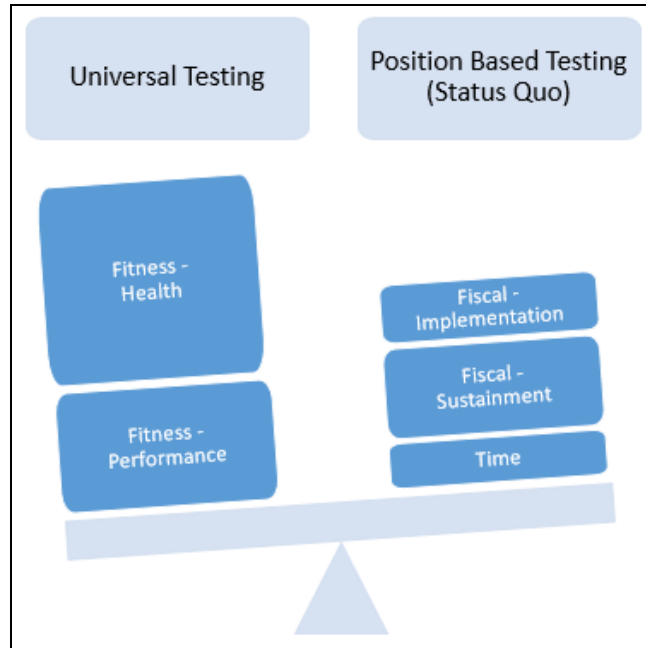


Figure 4. Conclusions

Source: Created by author.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

While I recommend in the strongest terms to the respective officers, activity, vigilance, and firmness, I feel no less solicitude that their deportment may be marked with prudence, moderation and good temper. Upon these last qualities, not less than the former, must depend the success, usefulness, and consequently the continuance of the establishment, in which they are included.

— Secretary of the Treasury William H. Crawford,
“Circular to the Captains of Revenue Cutters,” in
Harold Syrett, ed., *The Papers of Alexander Hamilton*

Overview

Conclusions gathered within this report support the implementation of a UPFT within the USCG’s Afloat Community. A body weight and height measurement is inadequate to project true health, and self-reporting of fitness has errors. However, due to the focus on only the Afloat Community, this study does not definitively support a USCG-wide UPFT. The Afloat Community’s unique reliance on physical attributes, directed at performance and safety, does not necessarily correlate to all USCG communities. Chapter 5 begins with a synopsis, followed by conclusions, then recommendations, addresses counterpoints, recognizes potential challenges, identifies further studies, and closes with a final thought.

Synopsis

The research initiated with the question of whether the USCG should have a pUPFT. A broad search into literature covered total fitness and business policy changes. To evaluate the question, a comparison analysis approach was chosen. Prior to starting the analysis, the researcher screened the courses of action for feasibility, acceptability,

suitability, and distinguishability. Using business models and CAQDAS, weighting factors and evaluation criteria were developed. Next, the researcher concluded by assessing the courses of action with respect to the evaluation criteria based on the available literature. After scoring and applying the weighting factors, the researcher numerically compared the courses of action and performed a factorial sensitivity analysis. The final recommendation is to adopt a pUPFT.

Conclusions

The findings of this study endorse the adoption of a periodic physical fitness exam for all afloat officers. U.S. merchant mariners on inland waterways are “at high risk for lifestyle-related diseases such (as) cardiovascular disease and show a high prevalence of metabolic syndrome risk factors.”¹⁵⁷ Without a regular physical fitness routine brought on by testing, the same risks are prevalent within the USCG. The USCG requires afloat Guardians to be physically fit in order to effectively and efficiently perform the mission but does not universally test sailors’ physical fitness. However, the USCG does designate common physical tasks for merchant mariners and holds them accountable for performance of these physical tasks. Moreover, even the Navy Personnel Research and Development Center developed common physical shipboard tasks for the Navy to periodically test, yet the USCG does not hold a periodic evaluation of any common physical task for USCG sailors. What is fascinating, is that in general, federal law enforcement does not conduct an annual PFT, yet the USCG requires its law enforcement officers to maintain physical fitness standards regardless of location or conditions.

¹⁵⁷ Scovill, Roberts, and McCarty, 640.

The USCG values Guardians' health and performance over time and money. These values were shown through a CAQDAS as present in the *Coast Guard Health Promotion Manual* and leadership speeches. Furthermore, a review of available literature showed that health and performance support the adoption of a periodic PFT to achieve the USCG principles; whereas, the literature exposed the time and fiscal cost of implementing a fitness test and favored the status quo. Ultimately, when applying the USCG values, the data endorses the adoption of a periodic PFT.

Recommendations

The USCG should mandate a universal physical fitness standard for all afloat officers. Furthermore, the USCG should identify C-GAT and correlate the performance portion of the physical fitness standard to the C-GAT.

The USCG should develop and require a pUPFT. At a minimum, the test should provide a go/no go criterion based on C-GAT to assist commanding officers with assessing risk and readiness. Furthermore, the USCG should capitalize on the extensive research done by the DOD to cultivate a PFT which adequately captures both performance and health. PFT development is an art and a science, which will inevitably require several iterations to perfect. However, this should not deter the immediate implementation of a pUPFT.

Finally, the USCG should reallocate resources to reinstate Unit Health Promotion Coordinator training. As of September 2015, "rates of obesity now exceed 35 percent in three states (Arkansas, West Virginia and Mississippi), 22 states have rates above 30

percent, 45 states are above 25 percent, and every state is above 20 percent.”¹⁵⁸ This demographic is producing the next generation of USCG members. While new recruits must meet a standard to join, most likely they have grown up with a preconditioned idea to place little value on physical fitness. The organization and society will need to change to educate and ensure that this group does not fall into old habits. The USCG, as part of the U.S. population, reflects America’s culture and attributes. A key component in motivating adults to exercise is education.

Counterpoints

A review of available literature suggested four justifications to explain why the USCG has not adopted a periodic PFT. The first justification is that the DHS does not require physical fitness testing. DHS is a diverse organization, and the USCG is one of many unique agencies under DHS. The diversity of DHS precludes a uniform policy addressing physical fitness testing. However, the Coast Guard as a member of the U.S. Armed Forces and closely related to the DOD, should consider this justification as insufficient.

The second justification is that the operating environment and confined space of the USCG’s smaller cutters inhibits regular exercises. As mentioned in chapter 2, other services also struggle to maintain fitness standards on vessels due to time and space. The data from both military and civilian studies concur with the difficulties of maintaining a

¹⁵⁸ The State of Obesity, accessed May 28, 2016, <http://stateofobesity.org/>.

healthy lifestyle aboard ships.¹⁵⁹ The austere operating and fiscal environment may preclude the feasibility of fully integrating physical fitness facilities for all units. However, many organizations in similar circumstances, including members of the USCG fleet, are able to overcome these obstacles. The USCG, known for innovation, will need to look to the fleet for ideas. For example, Chief Warrant Officer Michael Rieman on USCGC *DAUNTLESS* successfully implemented an engineering workout, not officially sanctioned, that used available shipboard equipment and spaces to conduct a comprehensive workout.¹⁶⁰ Thinking outside of the box, prisoners find unique ways to exercise in restricted environments. There are many other disciplines available for ideas, such as remote operators in the Arctic, missionaries in the jungles of Papua New Guinea, oil drillers in the desert of Iraq, and astronauts in space.

The third justification is that available information does not prompt a need. This study seeks to address this issue. This study highlighted the incompleteness of the information that would prompt action toward implementing a UPFT. The author highlighted the inadequacy in height-weight measurements and identified the USCG's reliance on self-reporting data.

The fourth justification is that literature has yet to address or challenge the issue. This study hopes to add to the body of knowledge the USCG uses to make policy decisions, in particular when addressing the fitness of the fleet. In some manner, this

¹⁵⁹ Marcus Oldenburg, Xaver Baur, and Clara Schlaich, "Occupational Risks and Challenges of Seafaring," *Journal of Occupational Health* 52, no. 5 (October 7, 2010): 249-256.

¹⁶⁰ CWO Rieman, Main Propulsion Assistant on CGC *DAUNTLESS* in 2014.

study hopes to address or at least open the conversation to counter the perceived reasons for not adopting a UPFT.

Challenges

With any policy change, there are barriers, conflicting ideas, and resistance to change. This section addresses two changes in tradition that may mitigate the findings, introduces a highly held conflicting view encountered by the author, and presents a potential dilemma in implementing a UPFT.

The first tradition is that a potential change in the USCG officer corps is blurring the generalization of the force through the introduction of specialties and the blending of civilian-military positions. While the enlisted force bears the brunt of the jobs that require physical attributes, there are also physical demands placed on officers within the USCG. Jon Davis offers a good summary of the current command structure for the armed services: “(O)ne is focused on a job (the enlisted) and the troops’ capabilities to do it, while the other is focused on command and deployment of those troops (officers).”¹⁶¹ As more specialized knowledge is required with the growth of technology, the USCG needs more subject matter experts. In fact, with these requirements, there is credence to arguing the abolishment of the officer corps. Although not yet employed, the USCG has further blurred the line between officers, warrant officers, and enlisted by creating officer specialties. With the blurring of the lines, officers can expect more physically demanding jobs. In particular, this is highlighted with pilots and ship drivers, two areas in which

¹⁶¹ William Treseder, “It’s Time To Abolish The Enlisted-Officer Divide,” *Task and Purpose*, June 4, 2015.

specialization and physical attributes are required. Furthermore, with the expansion of USCG missions, active duty positions are being filled by government civilians and contractors. In many ways, physical abilities, personal risk, and commitment differentiate active duty from civilian employees. Removing physical requirements brings into question the purpose and role of the active duty component as differentiated from the civilian population.

The second tradition, somewhat related to the first, is a shift away from mandatory sea duty. The USCG now allows up to 20 percent of graduating USCG officers to go directly to shore assignments.¹⁶² Until recently, this was not the case. In the past, all USCG officers served their first two years afloat. Proponents of all USCG officers serving afloat highlight the training aspect of sea service and the tradition of the USCG as a sea-going service. This debate potentially impacts the idea of C-GAT and UPFT. With fewer officers going underway, the common afloat tasks become less applicable.

The conflicting view is that the USCG does not need another requirement. The USCG, like many organizations, resists change. As expressed to the author by external sources and alluded to in chapter 1, the culture within the afloat community opposes any additional requirement. Additional requirements take away some of the autonomy of a ship's captain. In addition, the opposition to adopt fitness testing introduces the argument of friction with personal rights. How much should the USCG control members' health?

¹⁶² U.S. Coast Guard Academy, "Marine Safety Offices, Ashore Operations, or Flight Training," accessed March 4, 2016, <http://www.cga.edu/admissions2.aspx?id=71>.

Should the USCG prohibit the use of cigarettes and soda, which also negatively influence health? These same arguments can translate to physical fitness.

Lastly, the civilian population within the USCG is comprised of contracted personnel and government service employees, both with contracts and job descriptions, which dictate requirements and rarely include physical standards. This creates a dilemma; if physical fitness is important for health, then civilian employees should perhaps be included in the fitness program. On the other hand, requiring inclusion into a physical fitness program for the civilian population eliminates particular employees valued for non-physical skills. The Auxiliary component of the USCG is a purely volunteer community service force. Thereby, any physical fitness policy argument applied to the civilian force transfers to the Auxiliary component.

Further Studies

The author recommends pursuing follow-on research to quantify and validate elements within this study, as well as examine other missing policies that contribute to performance. To further this research, follow-on studies should verify the predominance of MONW in the USCG. To accomplish this task, a study is required to compare individuals' past height and weight measurements to a PFT using a representative sampling of USCG Afloat Officers not currently required to take a position-based test. A preliminary study could entail the Draft Survey in Appendix A. The survey with the height and weight measurement as well as the position-based PFT results would assist in quantifying the self-reporting error and further define potential cultural nuances. Additional follow-on studies to validate the findings of this research are a detailed fiscal cost breakdown and an examination of efficiency gained in USCG tasks due to physical

fitness. The cost of implementing a PFT varies widely. To evaluate the fiscal aspect, a baseline budget for implementation should be provided to an analyst to verify feasibility and provide further documentation for amplified screening criteria. While other studies quantify physically fit efficiency gains, it would be a reach to provide a direct correlation to USCG tasks. To provide this data, BGT or C-GAT would need to be established. Following the establishment of BGT or C-GAT, a trial could compare PFT scores to the time required to complete each BGT or C-GAT.

While this study supports the benefits of a universal physical fitness standard to elevate the overall capability of the Afloat Community, other factors, arguably to a greater extent, address the health and performance of an individual. Dimensions such as social wellbeing and factors such as nutrition play important roles in understanding cause and effect. Therefore, a holistic approach is required for optimal mission success. In particular, the Cutter Community places little emphasis on the physical factors of nutrition, sleep, and physical activity, yet these elements are required to effectively and efficiently accomplish the mission. In the same way that this study addressed physical fitness, the USCG should evaluate the nutrition and sleep programs within the USCG. During the course of this study, the importance of nutrition as related to performance and health surfaced. The best thing USCG leaders can do for the force is to revise and upgrade the policies regarding nutrition onboard USCG cutters. Ice cream, candy bars, and fried foods are far easier to obtain than fresh fruits and vegetables. With these facts, the USCG should undertake a full review of the nutrition policy and the actual implementation of the policy. Furthermore, very little consideration is given to sleep in

the Cutter Community.¹⁶³ Additional research is required to analyze the relevance of no crew rest policy within the cutter community on mission performance. The literature review emphasized the importance of physical fitness on performance, but also revealed that other factors play key roles. Relying solely on physical fitness is not a viable solution for any organization to maximize members' output.

Final Thought

The *Oxford Dictionary* provided the following definition: Health is “the state of being free from illness or injury.”¹⁶⁴ However, John W. Travis provided the idea of the Illness-Wellness Continuum.¹⁶⁵ This idea states that wellbeing “is more than simply an absence of illness.”¹⁶⁶ While the *Oxford Dictionary* is reliable and generally accepted as fact, the dictionary depicted a flaw in the way society thinks about health. The treatment paradigm is the idea that productive actions stop with the absence of signs and symptoms of illness. On the other hand, the wellness continuum concept allows proves that health is not binary, but instead assessable through a range. Society, including the USCG, requires a paradigm shift to improve fitness. The USCG currently tests for illness, but should start testing for wellness.

¹⁶³ The Afloat Community is the only USCG operational community without crew rest requirements.

¹⁶⁴ *Oxford Dictionary*, “Health” (New York: Oxford University Press, 2008), 299.

¹⁶⁵ John W. Travis, *The Wellness Workbook* (New York: Random House, 1972), 8.

¹⁶⁶ *Ibid.*

GLOSSARY

Active Duty or Active Military. Full time duty with military pay and allowances in the armed forces, except for training or for determining physical fitness and except for service in the Reserves or National Guard.¹⁶⁷

Afloat. Of a vessel which is floating freely (not aground or sunk).¹⁶⁸

Armed Forces. The U.S. Army, Navy, Air Force, Marine Corps, and Coast Guard.¹⁶⁹

Barkentine. “A three to five-masted vessel, of which only the foremast is square-rigged.”¹⁷⁰

Cutter. “Coast Guard vessel over 65-feet in length.”¹⁷¹

Exercise. “A subset of physical activity that is planned, structured, and repetitive and has as a final or an intermediate objective the improvement or maintenance of physical fitness.”¹⁷²

Fitness. “The condition of being physically fit and healthy.”¹⁷³

¹⁶⁷ U.S. Government Publishing Office, U.S. Code §101, Title 10-Armed Forces, PART I—ORGANIZATION AND GENERAL MILITARY POWERS, CHAPTER 1—DEFINITIONS, accessed May 5, 2016, <https://www.gpo.gov/fdsys/pkg/USCODE-2015-title10/pdf/USCODE-2015-title10-subtitleA-partI-chap1.pdf>, 17.

¹⁶⁸ Boats Online, “Afloat,” accessed May 5, 2016, <http://www.boatsonline.com.au/boat-terminology.html>.

¹⁶⁹ Work Management Office, National Oceanic and Atmospheric Administration, “NOAA Commissioned Corps,” Fact Sheet, U.S. Department of Commerce, accessed May 5, 2016, http://www.wfm.noaa.gov/POAD/FactSheetNOAA_CorpsOfficers.pdf.

¹⁷⁰ Sam Ivey, “A Glossary of Nautical Terms,” *Bewildering Stories*, 2006, accessed March 20, 2016, http://bewilderingstories.com/issue218/gilboy_glossary.html.

¹⁷¹ U.S. Coast Guard, “Coast Guard History: Frequently Asked Questions,” U.S. Department of Homeland Security, accessed January 12, 2016, <http://www.uscg.mil/history/faqs/designations.asp>.

¹⁷² Caspersen, Powell, and Christenson, 128.

¹⁷³ *Oxford Dictionary*, “Fitness” (New York: Oxford University Press, 2008), 246.

Personnel Qualification Standard (PQS). “PQS is a compilation of the minimum knowledge, skills and ability that an individual must demonstrate in order to qualify to stand watches or perform duties necessary for the safe, secure, and proper operation of a cutter or unit. PQS is not part of the enlisted advancement system.”¹⁷⁴

Physical Activity. “Defined as any bodily movement produced by skeletal muscles that results in energy expenditure. The energy expenditure can be measured in kilocalories. Physical activity in daily life can be categorized into occupational, sports, conditioning, household, or other activities.”¹⁷⁵

Physical fitness. “A set of attributes that are either health- or skill-related. The degree to which people have these attributes can be measured with specific tests.”¹⁷⁶

Surfman. “Men who crewed lifeboats and performed daring and often amazing rescues.”¹⁷⁷

Underway. A vessel that is moving under control: that is, neither at anchor, made fast to the shore, aground nor adrift.¹⁷⁸

¹⁷⁴ Commandant, U.S. Coast Guard, Commandant Instruction M1500.10, *Performance Training and Education Manual* (Washington, DC: U.S. Coast Guard, U.S. Department of Homeland Security, July 7, 2014), encl. 1, 3.

¹⁷⁵ Caspersen, Powell, and Christenson, 129.

¹⁷⁶ *Ibid.*, 128. Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research.

¹⁷⁷ U.S. Coast Guard, “Prospective Surfman Program,” U.S. Department of Homeland Security, December 10, 2014, accessed May 5, 2016, <http://www.uscg.mil/d5/staBarnegat/Psp.asp>.

¹⁷⁸ Commandant, U.S. Coast Guard, Commandant Instruction M16672.2, *Rules, International-Inland* (Washington, DC: U.S. Coast Guard, U.S. Department of Homeland Security, September 29, 2014), 9.

Uniformed Services. The Armed Forces, the commissioned corps of the Public Health Service, and the commissioned corps of the National Oceanic and Atmospheric Administration.¹⁷⁹

Well-being. “The state of being comfortable, healthy, or happy.”¹⁸⁰

¹⁷⁹ U.S. Government Publishing Office, U.S. Code §101, 17.

¹⁸⁰ *Oxford Dictionary*, “Well-being” (New York: Oxford University Press, 2008), 733.

APPENDIX A
DRAFT SURVEY

Purpose – USCG Cultural Effects with respect to Physical Fitness Testing.

1. Employee Identification:

Track input/correlate perceived fitness with self-determination—verify results/BMI

2. In your current position, are you required to take a PFT?

(Yes or No)

3. On average, how many minutes per week do you exercise?

(XXX minutes/week)

4. Is your direct supervisor required to complete a PFT?

(Yes or No)

5. On average, your best guess, how many minutes per week does your supervisor exercise?

(XXX minutes/week)

6. Are all of your subordinates required to take a PFT?

(Yes, No, N/A)

7. -if question 6 = No, then: Of your subordinates that are not required to take a PFT, on average how many minutes per week does a typical subordinate exercise?

-if question 6 = Yes, then: On average, how many minutes per week does your typical subordinate exercise?

-if question 6 = N/A, then: end survey.

APPENDIX B

USCG PHASE ONE PHYSICAL FITNESS TEST STUDY

The Coast Guard Fitness Advisory Committee sought to determine the current fitness level of Coast Guard personnel using both the current Boat Crew Physical Fitness Standard and a proposed six element fitness assessment based on Boat Forces job task analysis. Volunteers were solicited via ALCOAST, and 125 units with 1,050 members participated in the study. The participants were asked to take the Boat Forces test, and then at least forty-eight hours, but no more than two weeks later, were asked to take the proposed assessment. Testing for the Boat Forces test was administered by the Unit Health Promotion Coordinator and the proposed assessment was administered by the regional Health Promotion Manager. To accommodate all of the units' operational commitments testing began August 1 and concluded September 13. This report contains the results of the testing. Significant findings are summarized as follows:

The proposed assessments appear to be comparable to the Boat Force Fitness Test in measuring general fitness levels. The proposed assessments also evaluate elements of fitness found to be essential to Coast Guard operations such as upper body pulling strength and power and certain types of mobility not measured by the Boat Forces Fitness Test. Specifically, results indicate the following;

1. The 300-yard shuttle appears to have a strong relationship with the 1.5-mile run, sit-up, and push-up.
2. The inverted pull appears to have a strong relationship with the push-up, the sit-up, and the 1.5-mile run.
3. Pull-ups appear to have a strong relationship with the push-up

4. The t-test appears to have a strong relationship with the 1.5-mile run.¹⁸¹

Further analysis reveals that subjects who reported consistent exercise patterns for longer periods of time performed better on both the Boat Forces Fitness Test and the proposed assessments when compared to subjects with inconsistent exercise patterns. Regression analysis indicates that performance on either the Boat Force Fitness Test or the proposed assessments could not predict injury. However, analysis revealed two factors that are associated with predicting injury in this population. Specifically, it appears that years spent consistently exercising, and time exercising per week, were associated with decreased risk of injury. Finally, analysis indicated there was no significant difference among unit types with respect to injury rates.

¹⁸¹ The t-test is a common test for agility and includes forward, lateral, and backward running.

APPENDIX C

MERCHANT MARINERS REQUIRED TASKS

LISTS OF TASKS CONSIDERED NECESSARY FOR PERFORMING ORDINARY AND EMERGENCY RESPONSE SHIPBOARD FUNCTIONS		
<i>Shipboard Tasks, Function, Event, or Condition</i>	<i>Related Physical Ability</i>	<i>Acceptable Demonstration</i>
Routine movement on slippery, uneven, and unstable surfaces	Maintain balance (<i>equilibrium</i>)	Has no disturbance in sense of balance
Routine access between levels	Climb up and down vertical ladders and stairways	Is able, without assistance, to climb up and down vertical ladders and stairways
Routine movement between spaces and compartments	Step over high doorsills and coamings, and move through restricted accesses	Is able, without assistance, to step over a doorsill or coaming of 24 inches (600 millimeters) in height. Able to move through a restricted opening of 24 x 24 inches
Open and close watertight doors, hand cranking systems, open/close valve	Manipulate mechanical devices using manual and digital dexterity, and strength	Is able, without assistance, to open and close watertight doors that may weigh up to 55 pounds (25 kilograms); should be able to move hands/arms to open and close valve wheels in vertical and horizontal directions; rotate wrists to turn handles; able to reach above shoulder height
Handle ship's stores	Lift, pull, push, carry a load	Is able, without assistance, to lift at least a 40 pound (18.1 kilograms) load off the ground, and to carry, push, or pull the same load
General vessel maintenance	Crouch (<i>lowering height by bending knees</i>); kneel (<i>placing knees on ground</i>); stoop (<i>lowering height by bending at the waist</i>); use hand tools such as spanners, valve wrenches, hammers, screwdrivers, pliers	Is able, without assistance, to grasp, lift, and manipulate various common shipboard tools
Emergency response procedures including escape from smoke-filled spaces	Crawl (<i>ability to move body using hands and knees</i>); feel (<i>ability to handle or touch to examine or determine differences in texture and temperature</i>)	Is able, without assistance, to crouch, kneel, and crawl, and to distinguish differences in texture and temperature by feel
Stand a routine watch	Stand a routine watch	Is able, without assistance, to intermittently stand on feet for up to four hours with minimal rest periods
React to visual alarms and instructions, emergency response procedures	Distinguish an object or shape at a certain distance	Fulfills the eyesight standards for the merchant mariner credential applied for (see www.uscg.mil/nmc for more info)
React to audible alarms and instructions, emergency response procedures	Hear a specified decibel (dB) sound at a specified frequency	Fulfills the hearing standards for the merchant mariner credential applied for
Make verbal reports or call attention to suspicious or emergency conditions	Describe immediate surroundings and activities, and pronounce words clearly	Is capable of normal conversation
Participate in fire fighting activities	Be able to carry and handle fire hoses and fire extinguishers	Is able, without assistance, to pull an uncharged 1.5 inch diameter, 50' fire hose with nozzle to full extension, and to lift a charged 1.5 inch diameter fire hose to fire fighting position
Abandon ship	Use survival equipment	Has the agility, strength, and range of motion to put on a personal flotation device and exposure suit without assistance from another individual

Source: Commandant, U.S. Coast Guard, Commandant Publication 16700.4, Navigation and Vessel Inspection 04-08, Subject: Medical and Physical Evaluation Guidelines for Merchant Mariner Credentials, U.S. Coast Guard, U.S. Department of Homeland Security, Washington, DC, September 15, 2008, 2.

APPENDIX D

U.S. PUBLIC HEALTH SERVICE ANNUAL FITNESS STANDARDS



U.S. PUBLIC HEALTH SERVICE COMMISSIONED CORPS
REVISED ANNUAL PHYSICAL FITNESS TEST (APFT) COMPONENT SUMMARY AND REFERENCE
President's Challenge Eliminated 1 July 2015 • Revised APFT Effective 1 January 2016

SUMMARY OF ANNUAL PHYSICAL FITNESS TEST (APFT)

Component	Exercise Option	Continue vs. New	Performance Level	Gender Criterion	Age Criterion	Standard Reference*
CARDIORESPIRATORY ENDURANCE	Run	Continue	6 tiers	Yes	5 year cohort	US Navy
	Swim	Continue	6 tiers	Yes	5 year cohort	US Navy
	Elliptical	New	6 tiers	Yes	5 year cohort	US Navy
	Stationary Bike	New	6 tiers	Yes	5 year cohort	US Navy
UPPER BODY ENDURANCE	Push-up	Continue	6 tiers	Yes	5 year cohort	US Navy
CORE ENDURANCE	Plank	New	6 tiers	No	All ages	Peterson et al. 2013
	Side Bridge	Continue	6 tiers	No	All ages	US Coast Guard
	Sit-ups	Continue	6 tiers	Yes	5 year cohort	US Navy
FLEXIBILITY	Seated Toe Touch	New	Satisfactory/ Unsatisfactory	No	All ages	Previous US Navy exercise

*US Navy standards are based on data collected from 200,000 individuals in the Navy doing a Physical Readiness Test during 1997-1998. Compared to current PHS standards, some of the Navy standards for the run, swim, push-ups, and sit-ups are more challenging, some are less challenging, and some are the same. The PHS level 1 standards were retained for the satisfactory level for the run.

Source: Surgeon General of the U.S. Public Health Service, Personnel Operations Memorandum 15-004, Subject: Annual Physical Fitness Test (APFT) – Revised, Washington, DC, U.S. Department of Health and Human Services, May 14, 2015, 2.

APPENDIX E

NVIVO RESULTS WITH CRITERIA NODES



Source: Output of the NVivo 11 program.

Evaluation Criteria	Points	Weighting
Fitness-health	267	38.81
Fitness-performance	162	23.54
Fiscal-implementation	78	11.34
Fiscal-sustainment	121	17.59
Time	60	8.72

Source: Criteria nodes with NVivo 11 points and weighting.

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