

## **The operational heritage of the Pararescue Indoctrination Course with focus on shifts in student attrition, approaches to fitness training, and student demographics**

The occupational-specific fitness standards developed for pararescue always had purpose to ensure the better capable, healthier and adaptable personnel are trained and retained to perform pararescue duties. The empirical studies used to establish the occupational classification and mission standards that transferred to the concept and development origins of the Pararescue Indoctrination Course are traceable back to battle indoctrination training implemented during World War II.

During World War II the requirements for human performance and survivability under demanding perilous conditions began to be investigated and researched. The research looked into an extensive range of problems; however, some of the research looked into determining the optimum of physical fitness in flyers and included psychiatric and psychological studies of aircrew personnel in an attempt to discover the underlying reasons for the success or failure of these men.

The efforts resulted in indoctrination training for newly arriving combat crew replacements in the techniques necessary for air warfare in the theater. For example, the Far East Air Forces Combat Replacement and Training Center's indoctrination training included a lecture on psychological adaptation to combat. "This was found necessary inasmuch as most of these men had completed their training in the United States very recently and many were still somewhat unsure and anxious concerning their ability to cope with combat problems."<sup>1</sup>

Ability to cope with combat problems results from the combined phenomenon of changing attrition rates and operational conditions. Specifically this is about determining the conditions necessary for continued combat flying resulting in developing a psychological disability.<sup>2</sup> "Exhaustive psychiatric and psychological study of aircrew personnel was instituted in an attempt to discover the underlying reasons for the success or failure of these men. Three studies were made: the Morotai Study tested sixty-three "better than average" combat pilots' under extreme combat conditions; the Nadzab Study compared sixty-five combat experienced aircrew officers with sixty-five noncombat-experienced flying officers; and the Manila Study was concerned with eighteen officers who were evaluated by the Central Medical Examining Board. It was the aim of these studies to determine the possibility of using tests, inventories, and devices to screen out all undesirables before they reached the stresses of combat, or on the other hand, to predict the possible success of a flyer to withstand the usual stresses which would confront him."<sup>3</sup> Since the factors of stress, lack of moral fiber and certain psychiatric disorders are closely interrelated, the preventing the neurotic breakdown of a soldier in battle is an important consideration.<sup>4</sup>

Although performance of combat crews generally indicated that they could be "flown to death", this also indicated aircrews could be flown to a state of advance combat inefficiency.<sup>5</sup> To eliminate problems of advanced combat inefficiency determinants were used to set a point in the tour (typically number of combat sorties or combat hours flown) where flyers could be removed from flying combat sorties.<sup>6</sup> Sortie or combat hours flown end of combat tour points varied among the combat theaters and adjustments were made throughout the war to correspond with changing attrition (survivability) rates and operational conditions.<sup>7</sup>

The spring of 1942 concept origins for US Army Rangers of World War II brought with it special emphasis to find only fully trained soldiers of the best type. Officers and noncommissioned officers were to have superior leadership qualities with special emphasis placed upon initiative, sound judgment, and common sense. Although no age limit was established, it was pointed out that British commandos were an average of twenty-five years old. The screening and selecting criteria sought individuals having good stamina with natural athletic ability, and lacking physical defect. The lacking or without physical defects was more precisely defined as vision had to be twenty-twenty without eyeglasses, hearing normal, and blood pressure within limits normal for a man of twenty-five. Men with cardiac defects, slow reaction time, removable dentures, night blindness, or evidence of psychological disorders were disqualified.<sup>8</sup>

During WWII the Office of Strategic Services (OSS) was also forced to develop and implemented physical toughening, psychological preparation assessment methods and training to help its operational arms operatives survive and accomplish their missions.<sup>9</sup> During 1943, OSS headquarters began receiving worrisome complaints of incompetence in the field. There were even reports of a few dramatic mental breakdowns. To deal with this problem a plan was proposed and implemented in November 1943 for assessing prospective OSS personnel as to their physical, mental and emotional capabilities for their intended assignments. Groups of 15 to 20 recruits would spend three and a half days being observed by a team of psychologists and others as they underwent a series of tests and situational problems designed to evaluate mentality, personality, emotional stability, and aptitude. It proved so successful that such assessments became required for all OSS personnel going overseas. This is perhaps the most ambitious and successful utilizing of scientific psychological research methods effort during WWII that seemed to find candidates least likely to develop emotional problems severe enough to warrant removal from duty.

Unfortunately relying exclusively on psychological assessment cannot and does not indicate or predict having the physical capabilities and technical aptitude to meet the required human performance standards necessary to survive and be successful in accomplishing tasks and duties in the operational environment. Thus the complementing necessity for specific duty performance fitness or occupation-fitness standards for screening and selection of personnel includes an effort to “reduce battlefield psychiatric casualties”<sup>10</sup> and to increase survivability, effectiveness and potential for successful mission accomplishment.

The significance to Pararescue Indoctrination training is the awareness and understanding of a moral responsibility to preserve the efficient performance of personnel under sustained stress continued to evolve and transform after WWII into the concepts and principals of risk management and specifically operational risk management.

Foremost in understanding the history of the Pararescue Indoctrination Course and the totality of all the curriculum standards of all courses required for award of the 3-skill level is the core skill proficiency qualification standards is to understand causes for human performance inefficiencies and ineffectiveness when exposed to operational conditions. All training and occupational-specific physical fitness standards are driven by survivability in performing tasks in the operational environment and to minimize mission failure due to individual inability to adapt to and perform task effectively under duress of operational conditions.

It was the desire of medical department officers assigned to the School of Applied Tactics, Orlando, Florida and commanders of the Air Rescue Service during 1946 and 1947 that parachute rescue teams must have survivability and effectiveness in performing tasks in the operational environment. Consequently, for these rescue team members to exercise any measure of control of the survival environment they were expected to be put into, they must be properly trained and equipped. To succeed in doing the rescue, however, these persons must have the ability to cope, adapt, and possess a sufficient quality of moral fiber.

This document explores the human factors and human performance considered in the screening, selecting, and training of USAF Pararescue specialists and technicians. In doing so it will be shown when, how and why of the origins of and continued necessity for the USAF Pararescue career field having occupation-specific physical fitness standards and other human factors requirements.

## **THE SCHOOL OF APPLIED TACTICS, ORLANDO, FLORIDA**

The School of Applied Tactics, Orlando, Florida activated in October 1942. The school was designed to operate as a model air task force, its operational theater being an 8,000-square-mile zone in central and western Florida. Its organization structure included four departments: air defense, air service, air support, and bombardment. This school concentrated its efforts on training combat cadres after they completed the appropriate basic military training and academic courses. At the end of 1944, the departments of instruction were combat operations, communications, intelligence, logistics, aeromedical, antiaircraft, artillery, staff and special training, and inspection; these remained unchanged until October 1945.

The obscure history of the aeromedical department is in June 1944 the first formal survival school for training survival instructor cadre was established.<sup>11</sup> The newly appointed chief of the Aeromedical School at the Air Force School of Applied Tactics was Major Don Davis Flickinger whose previous wartime assignment was as a Flight Surgeon in the China-Burma-India Theater for the air transport wing flying the "Hump".<sup>12</sup> On 26 November 1951, he was assigned to the Air Research & Development Command as the first director of human factors at that command. In this capacity, he was responsible for research and development in the human factors area dealing with the biologic, psychologic and sociologic sciences.<sup>13</sup> Dr. Flickinger, who retired from the Air Force in 1961 as a brigadier general was a consultant to the National Aeronautics and Space Administration, National Reconnaissance Office and Central Intelligence Agency on high altitude medicine and high altitude survival and other human factors pertinent to screening and selecting the first astronauts and U-2 pilots.<sup>14</sup> His official Air Force biography is lacking in providing specific details of his career to include his involvement in concept development and establishing of the USAF Pararescue Specialty in 1947 and his subsequent involvement during the period from 1944 thru the 1950s in establishing human factors criteria for screening, selecting and training applicants to perform pararescue duties. "There is the aggressive response to stress, as we find in the tiger, and the docile response, as exhibited by the rabbit," he said in a 1958 newspaper interview. "We're looking for tigers."<sup>15</sup> Doctor Flickinger's affiliation and attentions to pararescue capabilities and utilization originates during August 1943 when he became the first military doctor (flight surgeon) to parachute to a location within enemy

controlled and occupied territory in remote Burma to accomplish the rescue of the downed crew and passengers of the 2 August 1943 crash of C-46 tail number 41-12420.<sup>16</sup>

The reorganization School of Applied Tactics resulted in the survival training responsibilities being transferred to the Air Rescue Service at some point between 5 December 1945 and 13 March 1946. The survival training courses of the School of Applied Tactics transferred to the 2156<sup>th</sup> ARU (TTU) then located at MacDill AFB, Tampa, Florida and subsequently the land and parachute rescue survival courses developed and implemented by the School of Applied Tactics transferred during January 1950 to the 2615<sup>th</sup> Air Rescue Squadron located at Palm Beach International Airport. These original rescue survival courses discontinued when these courses were shut down due to budget cuts on 24 September 1953. The 1952 curriculum for training pararescue specialists consisted of a screening and selection process followed by instruction in land rescue, precision spot parachuting, evacuation of injured or distressed personnel, administration of first aid, survival (arctic, jungle, desert), special vehicle operation, land navigation, Native psychology, mountain climbing, advanced swimming techniques, communications, aerial delivery of equipment, supplies, and medical procedures.

Since September 1953, if not earlier, Air Force survival schools and courses have lacked and continue to lack purpose of finding individuals who have the ability to aggressively cope with stress and train them to be competently proficient in performing SERE tasks and skills in the forward battlespace independent of an established airbase or its perimeter defenses. Even the training and qualification performance standards for the SERE (formerly Survival Instructor) specialty focus on subject mastery for instructional purposes and ensuring student safety rather than being a personnel recovery capability performing SERE in the operational environment. This contributed to the AF SERE (survival instructor) specialty lacking an acceptance-rejection selection course and specified physical fitness classification standards until 1996. The context of this history is mission need to find individuals who have ability to aggressively cope with stress to perform pararescue duties didn't disappear or become irresolute after September 1953.

## **ATTRITION**

Attrition encompasses a complicated gamut of human factors and environmental conditions and situations. Although student attrition from required training curriculums and operational attrition reducing availability of trained and qualified persons to put into the fight have similarity of being undesirable, remedying causes for one can often adversely affect the other. Balancing the undesirables of student attrition and operational attrition has been a persistent contentious discussion since the pararescue career field and required training to perform such duties were established in 1947.

The training requirement for producing new and replacement persons to perform pararescue duties has always focused on the identified human performance and human factors mission needs to accomplish the mission effectively with reasonable survivability.

High student attrition rates increases costs and time needed to produce sufficient numbers of newly trained and qualified persons. Unfortunately, remedies to reduce student attrition can have contradictory effect of materializes as higher training and operational mishaps rates, higher

potential for neurotic breakdown as person and team members try to perform tasks successfully under duress of the conditions and situations confronted in the operational environment

Although the purpose of job-specific physical performance standards is to ensure that personnel assigned to physically demanding jobs can perform those jobs regardless of body size or gender, too often sufficient human performance is considered only in perspective of passing a physical fitness test. Minimal consideration to the organ physiology (brain, heart, spleen, liver, skin) and characteristics of skeleton and body tissue (fat/muscle) mass necessary for stamina to perform physically demanding tasks for many hours and days. Seldom is any consideration and thought given to determining the quality of resiliency and other psychological human factors necessary to perform tasks under duress for many hours and days. Operational attrition occurring during World War II demonstrates there are many underlying human performance and human factors concerns involved in ensuring persons are ready and available that have suitable ability and willingness to perform in extreme conditions.

The Air Force has much cost reduction interests in minimizing conditions and situations causing attritions preventing students from successfully completing required occupation entry training. The attrition costs pertinent to producing job entry persons to perform pararescue duties are inclusive of paying for surplus people put into training that are only needed to neutralize the loss of those in training candidates who chose to quit during training (voluntary self-initiated eliminate from training) and failure to train elimination from training. Although not directly connected to student attrition is career retention attrition. Having adequate career retention rates reduces need to replace separating first and second enlistment trained and qualified persons with new untrained persons.

The moral and ethical quandary of finding persons possessing sufficient abilities to withstand the usual stresses encountered in performing at maximum effort for many hours and often many days while concurrently reducing student attrition costs contributed to occupation-specific fitness tests being developed and implemented for the Pararescue specialty in 1967. More importantly, this moral and ethical quandary combined with war fighting need for more numbers of pararescue personnel resulted in the Pararescue Indoctrination Course being established at Lackland AFB, Texas in 1965.

Attracting persons into training to perform pararescue duties is less difficult than finding persons willing to perform at maximum effort for duration of few hours to a day or two in the controlled training environment. These persons quickly self-eliminate themselves from training because of a lack of realistic understanding of the nature of doing tasks in a physically demanding and psychologically stressing operational environment. A commitment backed by conviction to be there contributing to accomplishing tasked mission goals and objectives is needed to be successful in performing the missions pararescue personnel are tasked to accomplish. This is evidenced by no matter how the minimal standards are adjusted to lower trainee attrition the attrition demographics is primarily populated by persons who voluntarily self-initiate eliminate themselves from training.

## **THE RECRUITING OR ATTRACTING GOOD PERSONNEL COMPLICATIONS**

The Pararescue occupation description and mission utilization of aiding and assisting others has a mystique of adventure, gallantry, being elite, and respectability that attracts many persons. Unfortunately, many of these individuals lack the life experiences exposure to understand the nature of human performance necessary in operational environment and the self-discipline commitment needed to sustain available to use mission ready qualifications. Consequently, there is a training problem of high numbers of potential candidates wanting to be trained containing a considerable lesser number of potential candidates that are both cost effective to train and time available efficient to train. This resulted in a merit selection process based the candidates excellence in abilities and experience being put in-place concurrent with the request in 1947 for the new occupation code that is the Pararescue Specialty code (AFSC).

The Commander of the Air Rescue Service officially requested during the fall of 1947 a new Specification Serial Number (SSN) for its newly developed survival-medical capability in its land rescue teams and parachute rescue teams. The 1948 recruiting advertisements and pamphlets for this new 3383 SSN had a long list of must experiences such as ability as a woodsman and in setting up and operating practical camp suitable for terrain conditions, preparation of landing and aerial drop areas, land navigation, land and water transport, characteristics wildlife, knowledge of natives, first aid and signaling.

The closing of the original Pararescue School (2156<sup>th</sup> Air Rescue Squadron) effective 24 December 1953 coincided with the downsizing of the number of pararescue personnel on each team from seven to five and the number of globally dispersed pararescue teams from 45 to 23. This created a surplus of about 170 trained pararescue personnel that were made survival instructors or reclassified into other AFSCs. The result was surpluses of serving WWII and Korean War combat veterans created circumstance for minimal need to train any significant numbers of new replacements. For the next ten years, (1953-1964) replacements and new pararescue personnel were OJT trained in certain CONUS located air rescue squadrons provided they already had adequate medical and survival experience gained from working in other military occupations.

Emerging irregular (limited/unconventional) warfare crises and increasing global utilization to rescue astronauts and to recover sensitive aerospace materiel drove force structure increase during the span of three years from about 120 pararescuemen to about 350 pararescuemen. Unable to find sufficiently physically fit volunteers to retrain from other military occupations into Pararescue, the decision was made to recruit for and select persons to classify into pararescue from among recruits while they were accomplishing their basic military training (BMT). This increase in numbers of trainees put strains on the scheduling students through the prerequisite survival courses, Army Airborne course and Army/Navy combat diver qualification course, and the entry-level medical course before arriving at the Pararescue Transition Course conducted at Eglin AFB, Florida.

The required training to become an operational pararescueman involves completing the maximum difficult and rigorous military occupational and special qualification training in the Air Force. Furthermore, the operational role assumed once all required entry training is completed and AFSC is awarded involves all members of the AFSC to participate in continuous maximum difficult and rigorous on-the-job training to sustain mission ready qualifications. Even though all entered into the training were volunteers, a large number of these volunteers

apparently had either a unique vulnerability to stress or lacked adequate level of physical ability and stamina to complete training, so they voluntarily self-initiated eliminated (SIE) themselves from training. Disposition of the large numbers of SIEed students during the airborne course, the combat diver qualification course, and entry-level medical course it had become an expensive burden to send the in the training pipeline SIEs to Eglin AFB for reclassification. This and other student attrition reasons resulted in Headquarters Air Rescue Service establishing the Pararescue Indoctrination Course at Lackland AFB, Texas in 1965.

## **PHYSICAL FITNESS STANDARDS AND MISSION READY CERTIFICATION**

Pararescue's occupational-specific fitness standards originate with establishing of the military occupation classification SSN 3383, now AFSC 1T2X0, in 1947. The fitness standards were linked to both for use to determining and evaluation (screen and selection) who should be put into training to perform pararescue duties and once trained and qualified who were marginal performers (injuries, age, illness) and or were losing willingness to sustain fitness needed to adequately perform pararescue duties. Another perspective is deliberate decision was made to avoid training and paying military service members who were marginal performers and/or lacked willingness to perform pararescue duties once trained and qualified. It's indisputable that obtaining and sustaining sufficient physical fitness for any rescue mission has remained a critical human performance factor for being qualified to perform pararescue duties since 1947 and remains so.

Entering into training required to perform pararescue duties is a deliberate self-selection decision. Self-initiated elimination (SIE) from training also requires a deliberate self-selection decision. SIEs are the bulk of student attritions. Deliberate decision was made to emphasize exposure to frequent physical fitness training once qualified by ensuring on-duty time was allotted to sustain adequate mission ready fitness. The mission ready fitness training requirement lacked any standardized method to objectively determine lack of adequate mission ready fitness until 1968.

The original standardized annual mission ready fitness test established in 1968 and was concurrently implemented as mandatory enlisted specialty entry into, award of AFSC, and retention of AFSC classification requirement. The justification was and remains the occupation-specific fitness standards are needed to sustain the quality of the mission ready force by ensuring pararescue personnel are physically qualified to perform the specialty's core skills and their pararescue specialty duties globally and under physically demanding field and combat conditions.

It was the increasing demand to train and qualify pararescue personnel to do in combat rescue of downed aircrew in Southeast Asia (SEA) combined with increasing necessity to determine when significant numbers of wounded-in-action (WIA) and in the line of performing duties injuries pararescuemen had regained sufficient physical fitness to return to mission ready status that gave the push to put in place these fitness standards. By 1967, many (physicians, commanders, and pararescue personnel) felt subjective standards were unfair and confusing and preferred a

mechanical arithmetic formula that was a clear-cut minimal mission ready standard. The corrective action was the Headquarters Air Rescue and Recovery Service developing and implementing the “Physical Fitness Qualification Standards” in 1967. The mission ready fitness and AFSC award and retention of AFSC classification standards and policies were originally published in ARRSR 55-11, Pararescue Operational Regulation. It must be emphasized the minimal mission ready fitness standard implemented a permanent coinciding policy of “any pararescueman who fails to meet these physical fitness standards will not perform pararescue duty (training or operational) except physical fitness training until he is capable of meeting the standards.

The original occupational-specific fitness test implemented in 1967 entailed swimming 2000 yards/1828.8 meters, running two miles and accomplishing 4-count flutter kicks, 8-count body builders, push-ups, sit-ups and chin-ups. The flutter kicks and body builders were removed when the Pararescue PAST became the PJ/CCT PAST in 1990. Current Pararescue and Combat Control occupational fitness requirements are provided in AFI 10-3502V1, Pararescue and Combat Rescue Training and AFI 13-219V2 Combat Control and Special Tactics Officer Standardization and Evaluation.

Human nature causes many applicants/candidates volunteering to be trained to perform pararescue duties to avoid admitting lack of motivation or having unique vulnerability to stress as influencing their decisions to SIE. Once in training as students many will more readily imply or feign lacking adequate level of physical ability and stamina to complete training as being the influence. Nonetheless, the improving student candidates’ physical ability and stamina to levels adequate to proceed into training has strong potential for reducing unacceptably high student attrition rates. The indoctrination course curriculum has improving students’ physical ability and stamina to minimal sufficient levels as the majority of its training goals and objectives for this reason. The secondary reason is the physically intense and physically demanding pipeline training has high potential risks for student death and injury. Ensuring students’ meet or exceed a minimal level of physical ability and stamina reduces the risk of injuries being a week or longer temporary medical disqualification or severe enough to become a permanent medical disqualification. Simply the less fit person is more susceptible to injury than the higher fit person is.

It is imperative to have understanding operational mission essential human performance necessities are crucial for the existence of the Physical Ability and Stamina Test (PAST) adapted into a recruiting, screening, and selection standard (occupation entry classification standard). In doing so the Pararescue specialty became is a military occupation distinctive first within the Air Force’s classifications standards. The establishing of the formal Pararescue Indoctrination course in 1965 also became a distinctive screening and selection first among all Air Force specialties (occupations). Twenty years passed before any other Air Force Specialty considered implementing any similar occupational mission ready and classification standards to ensure those performing duties of the specialty are physically fit with adequate resiliency to perform duties of the specialty.



**A CONDENSED HISTORY  
OF  
PARARESCUE SCREENING AND SELECTION BEFORE 1965**

The recruiting for persons for classification into the pararescue military occupation has a noticeable transition demarcation happening in 1965. Prior to 1965 the screening and selection was a less regulated pre-screening and selection process in that it did not typically or generally happen until the candidate in training had completed the Basic Airborne Course at Ft Benning and after perhaps required survival and medical training was also completed. The effectiveness of such delayed screening and selection benefited from most of the applicants being were combat veterans of WWII and the Korean War combined with the low mission need for significant numbers of newly trained and qualified pararescuemen.

The demands for increasing numbers of mission ready pararescuemen due primarily to escalating hostilities in Southeast Asia and expanding manned space exploration activities exposed an expensive and time consuming screening and selection inefficiency. Corrective action resulted in all reliance of obtaining new pararescueman from classifying applicant out of a current AFSC into pararescue to almost entirely recruiting and screening-in entry applicants as they accomplished and completed Basic Military Training (BMT). In 1965 the screening and selection being done at Eglin AFB was relocated to Lackland AFB due to the cost savings obtained by eliminating travel costs and travel time of sending those eliminated during the screening and selection process back to Lackland AFB to be classified into another AFSC. Regardless screening and selection of applicants volunteering to perform pararescue duties was implemented concurrent with approval and establishment of the new military rescue and survival occupation Specification Serial Number (SSN) 3383 in the fall of 1947.

The 1947 screening and selection process clearly sought out rugged applicants having “must” experiences in practical forestry, logging, agriculture, prospecting, and wilderness mapping and surveying type skills. Having sufficient physical ability and stamina was a dominant and compulsory concern of the screening and selection process.

While the specifics of the fledgling fitness ability and stamina screening and selection regimes is lacking in the historical record, being able to perform grueling duties in harsh environments for many days was the template for instituting rigorous physical fitness training requirements. From the outset, the persons needed to perform any rescue mission had to endure intense physical activities and adapt to a variety of psychological stressors. The most common stressors being sleep deprivation, movement in extreme temperatures and climates, interacting with and communicating with friendly and unfriendly indigenous peoples and cultures, taking control over survivors and aiding assisting them while also providing security, plus potential isolation during the mission in isolated and remote areas.

New military occupation SSN 3383 seeks volunteers. Applicant prerequisites desired is having had service with the United States Forest Service or other comparable organizations provided such service was active operationally rather than administratively. Avocations or vocations such as trapping, extensive hunting, professional guide, forest ranger, game warden and extensive farm

experience of such nature that indicated inherent responsibility and sense of improvisation indicate what is considered in the screening and selecting of applicants. –June 23, 1948<sup>17</sup>

“The most important quality which rescue and survival personnel required was self-reliance and mature judgment in addition to experience. The mere fact that an individual was a qualified jumper did not necessarily make him a good candidate for the rescue and survival school. The training to become a jumper was approximately 3% of the total training required to become a qualified specialist.” –December 1951<sup>18</sup>

Self-reliance, mature judgment, sense of improvisation, inherent responsibility describes attitude, motivation and most importantly ability to adapt to doing under duress. These human performance qualifiers are the neuropsychobiological aspects of resiliency. Psychological resilience is defined as the capacity to adapt successfully in the presence of risk and adversity. The stressors may be combat stressors or a mix of potentially psychological, physical, and environmental stressor events. Pertinent to this, sustaining a life style that includes exercising vigorous regularly contributes significantly to developing self-confidence to take decisive actions in adverse situations. Effective physical ability and stamina training connected to screening and selecting applicants for entry classification into the Air Force’s pararescue specialty must consider the neuropsychobiological aspects of resiliency.

## **A CONDENSED HISTORY OF THE PARARESCUE SCREENING AND SELECTION AFTER 1965**

Increasing demands to search for (recruit), screen and select (efficiently train) volunteers to perform pararescue duties combined with changing recruit source demographic (recent high school graduates rather than work experienced service members) forced the screening and selection process to be more specific minimum performance requirement and criteria regulated to detect the volunteer prospects most likely to complete training and subsequently be there willing to perform pararescue duties for the remainder of the enlistment service obligation. Essentially, the screening and selection criteria used prior to 1965 began to have a minimum necessary occupation-specific performance achievement needed to successfully get through all required training and subsequently to perform pararescue duties being “officially” established, approved and implemented.

The successes of the prior to 1965 screening and selection processes combined with the “official” occupational-specific performance requirements were fused in the establishing of the Pararescue Indoctrination Course at Lackland AFB during 1965.<sup>19</sup> The mission purpose given the course by Headquarters Aerospace Rescue and Recovery Service and the Military Airlift Command had three goals: (1) reduce student attrition costs, (2) reduce amount of training anxiety and hazing students experience, and (3) develop realistic occupation expectations and buildup the set of attitudes and behaviors considered necessary to perform duties with survivability. However, when the course began training operations, it had too few numbers of instructors and support staff and minimal, if any, developed curriculum.

The initial staff and instructors consisted of a Technical Sergeant (E-6) and Airman First Class (E-4). Neither of these two persons had any pararescue training and qualifications experience or background. It operated as a between BMT and pipeline training administrative holding area focused on students doing a lot of swimming, running and calisthenics until they shipped out into pipeline training courses. By 1967 or perhaps 1968, two and occasionally three pararescuemen were the Indoctrination Course instructors and staff.

During the period or 1965 to 1973, each class typically started with 50 students with about 25 put into the training pipeline. Ten students were typically lost during the pipeline training. One or two attritions perhaps happened at jump school with most of the losses being at SCUBA School (now called combat diver qualification course), Key West, Florida.

The physical fitness training approach and methods from 1965 to late 1973 relied on plentiful regular physical activities where the movements other than swimming were done in unison by the group of students. Other than the swimming, the group exercising and formation running was led by the strongest or most fit student in the class. The approach favored improving strength, speed, and endurance to do military activities by doing with minimal consideration students in lesser shape were not gaining any of the improvement of physical ability and stamina benefits the indoctrination course was put in place to provide. Sufficient injury related attrition was giving evidence improper fitness training techniques and methods were causing too many students to suffer undesirable physical fitness caused injuries and ailments.

The lack of adequate numbers of instructors and an actual curriculum also contributed to avoidable student attritions. Training unpredictability resulting from absence of a set standard for course length and lack of a set minimum physical standard before entering the pipeline training encouraged suspicions among the student population of favoritism or a patronage system of some sort existed. This unpredictability allowed some applicants to proceed into pipeline courses after a few days while others waiting several weeks or months in a limbo training status before proceeding to the pipeline courses. Contributing to the problem were the pipeline courses' start dates didn't align with an Indoctrination course lacking a set start and completion date.

The insufficient numbers of instructors also fostered too much reliance on the selection team using a student who appeared to be better than the rest to lead and conduct the students' physical training activities. The outgrowth of this practice was incidents of hazing and prejudice by student against student.

By mid-1973 the need for corrective actions was unquestionably noticeable. An emphasis change towards balanced physical activities backed by a medical approach happened during a span of about six months. Accompanying this change was considerable emphasis and effort was being involved in developing curriculum having fitness training goals and objectives with clear and concise standards. Increases in administrative support staff and instructor staff was requested so those called to duty to be instructors at the Pararescue Indoctrination Course could be more directly involved in supervising students' physical fitness activities.

Although passing an Indoctrination Course screening fitness test administered by the courses cadre during BMT was required prior to mid-1973, it was in 1973 that orientation changed from

a Fitness certification test to a Physical Ability and Stamina Test (PAST) with the course completion PAST standards being more rigorous than the course entry standards. Additionally it was during 1973 and 1974 the courses physical fitness activities arrangements adopted six steps over an eight-week period in degree of difficulty progression.

The need to reduce athletic caused injuries such as shin splints, runners knee (chondromalacia), tennis elbow (Lateral epicondylitis or lateral epicondylalgia) and other athletic activity injuries resulted in seeking expert advice Wilford Hall Medical Center Physical Therapy Department and other centers of expertise to evaluate the course's physical fitness training activities.

“Musculoskeletal injuries resulting from basic and advanced individual training pose the single most significant medical impediment to military readiness. Military research and the committee's own analyses show that both male and female recruits who have low levels of cardiorespiratory fitness are more likely to be injured or leave basic training and military service early (or both) than those with high levels of cardiorespiratory fitness. Women with low fitness are twice as likely as men with low fitness to be injured and to leave military service.”<sup>20</sup>

“Two recommendations concern reducing injury and attrition: (1) develop a standardized fitness test for use in the recruiting process and (2) tailor the demands of basic training to the fitness levels of recruits. Recommendations aimed primarily at reducing attrition involve obtaining better information about recruits' mental health status via the use of a brief self-report of mental symptoms at the military entrance processing station, accompanied by a brief mental status exam by a physician.”<sup>21</sup>

This resulted in the implementation of proper warm-up and other medically sound principles of exercise so students train their bodies properly. Professional sports/exercise physiologists have remained involved in the Indoctrination Course's curriculum development and student training operations since 1974.

The combined results of all these efforts and changes were a substantial decrease in student attritions resulting from injuries and failure to train. Unfortunately, the SIE student attrition rates had no significant decreases.

During the 1990s, an undisputable shift in the nature of recruit demographics that included significant decrease in the number of recruits put through BMT each year imposed increasingly more challenges to find ways to reduce student attritions.

Recruit quality peaked in 1992<sup>22</sup> and has generally declined since.

“The evidence suggests that cardiorespiratory endurance in young men has declined by approximately 10 percent since 1966, whereas there was no change for young women during the same period.”<sup>23</sup>

“The prevalence of overweight in children and adolescents tripled between 1963 and 1999 from approximately 5 to 15 percent.”<sup>24</sup>

This made recruiting for qualified pararescue applicants while they were going through BMT extremely improbable. This resulted in decision circa 1996 to use the Air Force Recruiting Service to prescreen potential recruits using a Physical Ability and Stamina Test (PAST) and enlisting qualifying applicants with a Guaranteed Enlistment Training Program (GTEP) contract for pararescue. By circa 2000 the PAST and GTEP enlistment was being completely relied on to get applicant into the Pararescue Indoctrination Course and subsequent require pipeline training. However the no-change for the better and perhaps change for the worse in student attrition demonstrated the effectiveness of the passing the PAST was poor predictor of which student would or wouldn't decide to self-initiate eliminate (SIE) themselves from training.

Considering the medical examination (Class III flyer medical examination) and Physical Ability and Stamina (PAST) standards required to obtain a GTEP enlistment contract the decrease in the quality of recruits pertinent to this discussion is connected to human performance. Most frequently, the cause for failure is lack of motivation and not lacking in ability.

The most relied upon quality of recruit demographics benchmarks of persons having a high school diploma and scoring above average on the Armed Force Qualification Test (AFQT) are unsuitable to define quality of recruit equally for all military occupations. Although ASVAB, PULHES, PAST, and other tests all measure abilities to predict the extent to which the person can be trained, these tests cannot predict the attitude, willingness, and motivation to perform to required performance standards in the operational environment. The challenges of finding persons to put through required training for award of pararescue AFSC and getting them through the training has always existed, it's just becoming more prevalent.

Problems with the physical fitness of inductees were a great concern during WWI and again in WWII. A quote from General Omar Bradley best sums up the how long lacking fitness to perform combatant military duties has been a concern.

The rudest shock we experienced with the draftees was the discovery that they, the prime youth of America, were generally in appallingly poor physical condition. Some of our draftees could not walk a mile with a pack without keeling over. Most were overweight and soft as marshmallows. Only a few were capable of the hard sustained physical exertion that we knew they would experience in combat.<sup>25</sup>

Problems with the motivation of volunteers changing as they became aware of the different dimensions of various tasks or the nature of the workload differing from expectations were also a problem during WWII.

“In many instances, members of a pre-existing division simply volunteered for parachute duty in order to escape their old unit and experience something new. Making full use of the no-questions-asked policy, many of these recruits simply quit after realizing that the workload and training schedule entailed something much greater than what they first expected.”<sup>26</sup>

The simplest explanation of the circumstances is the level and quality of motivation (dominant attitudes, conscious and unconscious psychological resiliency, level of self-discipline, and

ability/willingness to adapt) of the person is unknown until the candidate is exposed to the activities of the pararescue indoctrination course curriculum. Accordingly, the Pararescue Indoctrination Course to a limited degree gives students' the opportunity to self-screen themselves out of training before the Air Force invests too much time and money in their training.

While increasing lack of physical fitness is one element of decline in the quality of recruits since 1992, so has the quality of their motivation to be there participating and contributing to mission accomplishment in face of adverse and perilous conditions and environments declined. Unfortunately, predictors for mental and emotional resiliency aspects of human performance in physically demanding combat/tactical environments in adverse conditions are lacking.

“Psychosocial factors, such as pressure to perform, the organization of tasks, and the social context may also contribute to musculoskeletal injuries and attrition among military recruits. Few studies have attempted to understand the causal relationship between psychosocial factors and biomechanical loading of the musculoskeletal system.”<sup>27</sup>

“From 1996 to 2008, medication fills have increased considerably for mental health and/or substance abuse conditions. The categories of medication with the greatest growth have been antidepressant medications for adults and stimulant medications for children.” ... “The number of psychotropic medication fills for children nearly doubled between 1996 and 2008.”<sup>28</sup>

Whether the prescription fills specifically for the treatment of a childhood emotional or behavioral health problem has any correlation is irrelevant. The necessary human performance to successfully complete all required training for award of the pararescue specialty requires internalized self-motivation. This level of internalized self-motivation is dominantly determined by the person's character traits and not the person's abilities. Consequently, the student's early in the course choice to voluntarily SIE from training is a decision to no longer train and is not a result from lack in ability to train. This decision results from a compromised or lacking motivation. The cause of the compromised motivation was quickly attributed to the student/candidates having impaired abilities to cope with or overcoming exposure to adversity or stress. The corrective action implemented 1997/98 was to assign a psychologist to the Pararescue Indoctrination Course to give the students stress management training and counseling to give trainees tools to help them deal with high-stress situations.

## **THE OPERATIONALIZED CONTRIBUTION**

The “Quality Not Quantity” motto for the Pararescue Indoctrination Course has existed since 1965. While the most obvious intent of the motto emphasizes graduating the better student is more important than the numbers of students graduated, the less obvious emphasis pertinent to better is operational suitability of the human mission ready capability. The operational suitability is in the context of the full spectrum of anticipated operations and operational environments the human performance capability is engaged into to aid and assist others or to recover sensitive aerospace materiel or devices.

Being a nice and decent person is not a human performance mission need for having survivability in the operational environment, having fitness to perform is, having fitness to adapt to the environment employed into is. A willingness to be there participating with useful contribution to mission accomplishment is necessary.

[Heroism is there stock in trade. On Friday 13 February 1953 shortly after midnight, T/Sgt Charles Abbott and S/Sgt John Bowers jumped over the flaming crash of a B-36 near Goose Air Base. It was 20 below zero when they stepped out of their SC-47 into the midnight darkness. After landing it took them four hours to crawl a mere 300 yards through deep snow drifts before they finally reached the survivors. Despite the hard going they were able to treat the injured and at dawn 14 survivors and the pararescuemen were taken by helicopter back to Goose air Base. ... On 16 April 1954 two pararescuemen, T/Sgt Elliott Holder and S/Sgt Robert Christensen, jumped to the crash site of a Navy patrol bomber high on the Greenland polar ice cap, far above the Arctic Circle. They jumped in the faint hope that someone might have survived the crash. High winds nearly dragged Holder to his death over a 1,900 foot precipice. A howling Arctic storm with winds over 100 miles an hour pinned them down for 11 days. On the 12 day when the storm subsided, they were picked up by helicopter none the worse for wear—thanks to their superb training and conditioning. ... These pararescuemen could have paid with their lives. Instead they definitely established that with the proper equipment and training, troops can survive for significant periods of time in the Arctic at its worst.]<sup>29</sup>

[Pararescuemen come in all sizes—short and stocky, long and lanky—and have backgrounds as varied as the colors of the rainbow, but they are a special breed and are almost literally cast from the same mode. ... The consistently heroic conduct of these men under pressure demonstrates it and the countless successful rescues they accomplished are an additional tribute to this training.] – December 1955<sup>30</sup>

This willing to be there level of operational human performance capability to directly control the survivability fate of others within and behind enemy lines or isolated and in need of rescue from other perilous environments needs a person motivated to act in a specific, goal directed way. It also requires an ability to solve demanding circumstances for the duration of the operational mission. This level of problem-solving is not decision making. Problem solving involves gaining awareness of the problem by analyzing a situation, then creating, implementing and assessing solutions being effective.

This operational problem-solving aspect of needed ability was emphasized in the published findings of a 2012 study focusing on “Reducing Attrition in Selected Air Force Training Pipelines”.<sup>31</sup> This study’s analysis found an interesting Armed Service Vocational Aptitude Battery mathematics knowledge aptitude correlation having some statistically significant in predicting students’ success getting through required training, with no clear technical occupational task knowledge or academic grade explanation suggested. The study further expressed the strangeness of finding such a correlation, as the student group is all volunteers already preselected for success in pararescue.

The ASVAB subtest score of mathematics knowledge, included in the ASVAB composite general score (44 for pararescue), was considered too low. However instead of raising the general score it was suggested “there might be some advantage in a different composite for PJs instead of the current distribution of jobs among the four (Mechanical, Administrative, General, Electronics) ASVAB composites.”<sup>32</sup> Of the five AFSCs (1C1X1, air traffic control (ATC); 1C2X1, combat control (CCT); 1T2X1, pararescue (PJ); 2A6X2, aerospace ground equipment (AGE); and 3E8X1, explosive ordnance disposal (EOD) studied only Pararescue had such a finding and recommendation.

While the study gave no explanation as to why mathematics was a statistical predictor for increasing graduation rates (lower student attrition rates), the level of problem-solving involved in performing pararescue duties engages a similar set of cognitive actions or activities similar to that is used to do higher level applied mathematics word problem type solving. Simply this study’s different composite for pararescue screening suggests cognitive ability and affective (situational awareness, attitude, motivation, psychological resiliency) ability has equal importance to psychomotor abilities. The context being the degree of risk-taking, degree of responsibilities with accountability, and the degree of stress coping requires a person willing to be there performing assigned duties and tasked missions after being trained and qualified.

Production training standards must find and training those people most likely to successfully complete training and accomplish the expected performance in the operational environments. It must also train sufficient numbers of people willing to continue to perform pararescue duties beyond the first period of enlistment. Merely convincing the student to stay with the training generally contributes to higher turnover rates which directly connect to loss of unit combat readiness. Not only does this put trained personnel who are not contributing to operational effectiveness (malingering/absenteeism/tardiness, not sustaining mission ready status) it also increases the numbers of trained persons reclassifying from the occupation during the first enlistment or separating from service at the end of first enlistment. This mission readiness is lost until a replacement is recruited, trained and assigned to a combat operations unit. The Pararescue Indoctrination Course and other required entry AFSC awarding training in this regard is involved in ensuring a dependable and reliable Initial Operational Capability (IOC) is available to accomplish tasked missions. In perspective of human performance, the providing of operational capability is recognizable as obtaining and sustaining combat mission ready qualifications. This operationally imposes obligation on the Pararescue Indoctrination Course to put students into the training pipeline to sustain sufficient retention rates.

Because people differ, there are medical examinations to determine each person’s physical qualification for aircrew, parachute, and marine diving duty according to AFI 48-123, Medical Examinations and Standards. Because each Air Force specialty fulfills a unique mission, mission support or service support role, each of these occupations differ in degree of specialization of tasks and exposure to risks in operational environment.

## **ASPECTS OF CAPABILITY AVAILABILITY AND OPERATIONS INFLUENCING USAF PARARESCUE FITNESS TRAINING**



A person can put forth maximum performance yet be unable to accomplish required tasks in the operational environment. Accordingly, the consistent screening, selecting and training reality since 1947 is no amount of training time will overcome this deficiency. Pertinent to this there is a long history of vigorous physical fitness activities in the training of persons to perform pararescue duties and with the being mission ready to perform all rescue missions.

Many are attracted to volunteer to perform Pararescue duties as they perceive this level of performance exciting and gallant, but many who volunteer also lack experiences to understand the actual nature of the risks involved in the aiding and assisting service pararescue personnel provide or the challenging nature of the operational environments tasks are performed in.

“Landing in airheads. Paratroops can jump and materiel be dropped anywhere, if the rate of loss will be accepted. This is proven by the U. S. A. F. Pararescue teams now in service, and the parachutist forest rangers who use this method for rapid transportation into isolated areas to fight forest fires.” – May 1949<sup>33</sup>

The physical fitness qualification standards required of all Pararescue personnel commenced with the origination of the first pararescue teams in 1947. The fitness qualifications standards utilized over the years has always targeted obtaining and sustaining mission essential physical fitness.

“All rescue team members will participate in a minimum of four (4) hours of physical training each week (24-56 hours quarterly). The program will be designed to maintain physical standards required for any rescue mission.” – April 1951<sup>34</sup>

An International High Altitude Training Exercise conducted during the last week of June 1952 high in the Italian Alps near Solda Italy resulted in some valuable conclusions. ... “The report of Captain Davla on the exercise recommended tree jumps by Pararescue personnel in such areas, aerial resupply despite more rapid descent in the particular area and that personnel conducting missions in such areas be trained in mountain climbing and be in top physical condition.” – June 1952<sup>35</sup>

The pararescue mission ready fitness training philosophy initially relied only on plentiful regular physical activities with no standardized meeting minimal physical fitness certification. The minimal standardized applied to all members of the AFSC mission ready physical fitness certification test became a requirement in 1967/8 as result of general lack of awareness in the medical waiver consideration process in the physical fitness requirements in returning the healed from injury pararescue personnel back into mission ready duty. This policy was originally published in ARRSR 55-11 in 1968 as a result of mission need requirements.<sup>36</sup> Passing the PAST for AFSC entry and retention became part of the Air Force Enlisted Classification Directory (AFECD) Pararescue classification description requirements during the MAJCOM and Air Staff coordination to move Pararescue from Aircrew Operations to Aircrew Protection during the 1989 to 1992 period. This new PAST classification requirement happened no later than the March 1992 discontinuing the need to submit a special duty application to classify out of any AFSC into the Pararescue AFSC.<sup>37</sup>

[3.5.1. For entry into this specialty:

3.5.1.1. Successful completion of the Pararescue physical ability and stamina test (PAST) located on the HQ AETC/A3TPortal page.

3.5.3. For award and retention of AFSCs 1T231/51/71/91:

3.5.3.3. Physical certification and maintenance of personal physical standards as defined in AFI 10-3502, Volume1, *Pararescue and Combat Rescue Officer Training.*<sup>38</sup>

The only other AFSC in the October 1994 Air Force Enlisted Classification Directory (AFMAN 36-2108) having a PAST requirement is Combat Control.<sup>39</sup> Combat Control lacked an occupation mission ready fitness certification standards and policies until after 1985 and no other Air Force specialty identified an operational or mission need for such an occupational physical fitness standard until after the mid-1990s.

## **HUMAN EFFECTIVENESS AND EFFICIENCIES NECESSITIES OF OTHER AIR FORCE SPECIALTIES**

Most Air Force specialties (occupations/career fields) gave little attention to addressing or implementing occupation specific fitness standards before or after selective service conscription (the draft) ended in 1973. Fitness became more oriented towards healthy weight and appearance of fitness in uniform more so than performing duties in hazardous physically demanding environments as Air Force specialties (occupations/career fields) oriented towards being specialties primarily technically challenging and away from being physically challenging and requiring duty performance in physically demanding environments. Furthermore most Air Force specialties (occupations/career fields) did not anticipate the combined impact of a reducing force structure and force structure gender and marital status demographics changes adversely affect manning requirements, unit combat readiness, individual combat readiness, and the member's professional military career development.

The abundant under employed workforce during a peacetime military having low OPSTEMPO/PERSTEMP rates also allowed most air Force career fields and unit/organization commanders to avoid giving attention to medical attrites (pregnancy, fitness restrictions, and medical conditions that may affect assignment, retraining, or deployment) impairing unit combat readiness and mission accomplishment as somebody was always available.

It wasn't until Congress taking action through the Goldwater-Nichols DOD Reorganization Act, which reorganized the US military in 1986 and the 1987 the Cohen-Nunn Amendment that addressed Special Operations Forces specifically did other Air Force specialties begin to consider setting up fitness standards to ensure mission ready dependability, reliability, and availability. At this time due to lack of clear specialty specific empiric studies and lack of mission utilizations mission reports several Air Force specialties (occupations) began to borrow, assimilate, integrate, or adapt the existing pararescue occupational-specific fitness standards as needed for new emerging and expanding from Army support to special operations role and

utilization. Other specialties adapted pararescue occupation-specific fitness standards primarily for purpose to ensure the better/stronger in human performance capability was put into training, qualified to perform duties and retained in the AFSC for two or more enlistments.

The Pararescue enlisted specialty was the only Air Force specialty, enlisted and officer, having occupational-specific fitness tested requirement and a formal screening and selection (Indoctrination) course prior to 1988. Other than the Combat Control specialty no other Air Force specialty placed any importance to developing and implementing occupational-specific fitness requirements prior to 1993.<sup>40</sup> Much of the lack of interest is attributable to the prevailing dominate number of duty position assignments existing in these specialties lacking any above average level or degree of physical fitness to adequately perform duties of the specialty. For a small number of Air Force specialties (AFSCs), after 1993, a multifaceted set of changing conditions, including technological evolution, new concepts of operations, force downsizing, and organizational and mission changes were casuals for these specialty's to begin to place some importance to developing and implementing either fitness standards to enter required AFSC awarding courses or to implement occupational-specific fitness standards. This increasing numbers of specialties' implementing PAST standards and policies has put Pararescue's PAST and mission ready fitness standards into a status quo contest of appeasing the lowest common denominator as other Air Force specialties decided to implement what it considered essential fitness standards for adequate fitness to perform duties of the specialty. The January 2013 decision by President of the United States and Secretary of Defense to integrate woman service members in all air, sea, and ground combat military occupations has intensified social engineering need to establish the common lowest denominator universal combat fitness standard.

Regardless, the rethinking physical fitness began at different times for each specialty. The why and when history is somewhat important as the concerns to ensure gender-neutral standards exist has administers and managers lacking operational background and experience resort to overemphasizing fitness standards are unrealistic stringent by focusing on the task similarities one or more occupation share and ignoring the adverse condition differences in the operational environment. Some even perceive the training environment as having the same degree of environmental unpleasantness and risks as the operational environment. Pertinent to similarities and differences of operational environments it is important to have deployability posture (combat readiness) awareness of the unit or UTC (combat forces, combat support, combat service support) the larger numbers of members of the specialty are duty position assigned to. Other differences to consider is how many duty positions the population of the AFSC is occupying is subject to combat readiness reporting under JCS publication 6, volume V and how large a percentage of the population of the AFSC sustain mission ready status to primarily operate as surface combatants removed from traditional airbase support, logistics, and sortie generation efforts.

Although the Combat Control specialty has always required its members to have combat readiness, it lacked any stipulated occupational-specific physical fitness requirements until 1988. The origins of developing such standards are traceable back to 1977 when the radio operator-maintainer-driver was removed from the combat control teams and the subsequent occupational restructuring from being the 272X0D Air Traffic Controller/Combat Control specialty to the 273XO Combat Control AFSC effective October 1981 and subsequently the 1C2X1 Combat Control AFSC effective November 1993. This restructuring coincided with significant

introduction of new technology, new concepts of operations, and mission changes from supporting airlift operations to a stronger special operations utilization purpose. Organizationally during this period the Combat Control Teams were removed from the Aerial Port Squadrons to become the core specialty forming the Air Force Special Operations Command's (AFSOC) Special Tactics Squadrons. Shortly after Operation Urgent Fury (Grenada –October 1983) a rigid screening process was implemented for assignment selection of Combat Controller applicants to Det 1 MACOS. This screening and selection process expanded into being a classification entry requirement for award of the 3-skill level Combat Control AFSC in 1988. As the Combat Control specialty lacked both a formal entry classification selection course and occupational specific fitness tests and psychological ability to deal with duress and stress screening it was decided to use the existing Pararescue Indoctrination Course in 1988.<sup>41</sup> The first joint Pararescue and Combat Control Indoctrination class (88-002) graduated on 18 Dec 1987 with 14 students going into the two pipelines. This solution not only ensured combat control personnel were ready for the unexpected encountered in the operational environment, but also aided in the melding personnel from two specialties into a team when assigned to a Special Tactics Squadron. Although the Combat Control specialty separated out of the Pararescue Indoctrination Course in July 2000, the Combat Control specialty preserved the PAST standard assimilated from Pararescue as its classification fitness standard.

The Air Force's April 1993 removal of combat aviation exclusion policies<sup>42</sup> emerges as the convenient demarcation origin of when other Air Force specialties gained focus on combat readiness fitness standards. Also prior to October 1993 and for several years after, Pararescue and Combat Control were the only two Air Force specialties requiring testing of persons' fitness levels for entry into AFSC and retention of awarded AFSC classification purposes.<sup>43</sup> Furthermore, Pararescue and Combat Control were the only two Air Force specialties having required for every member pass annual PAST requirements for sustaining combat mission ready status.

Any pre-1993 fitness currency standards requirements other Air Force specialties had was limited the Air Force Fitness program (AFI 36-2905) that implemented the DoD Physical Fitness and Body Fat Program Procedures stipulated in DoD Instruction 1308.3. These standards have a wellness concept and lifestyle enhancement programs to improve general health and fitness orientation. These standards although promoting the minimum general health/injury prevention fitness suitable for serving a military obligation in the United States Air Force are not occupational-specific fitness physical fitness requirements. Pararescue's mission ready fitness certification policies and its classification fitness requirements is an occupational-specific fitness requirement deemed necessary to ensure adequate skill, performance, safety and reflects levels of physical abilities necessary to meet the duty demands of the occupation. DOD 1308.3 (paragraph 6.1.2.3.) clearly and concisely stipulates once such occupational-specific fitness physical fitness are determined physical fitness training and testing should be linked to these capabilities.

As of the Air Force Enlisted and Officer Classification Directories published effective April 2013 only Combat Control (AFSC 1C2X1), Pararescue (AFSC 1T2X0) Special Operations Weather (AFSC 1W0X2), Special Tactics (AFSC 13CX), Combat Rescue (AFSC 13DX), and Weather (AFSC 15WXC) have occupation-specific classification fitness requirements for entry into, award of and retention of AFSC. The SERE occupation-specific fitness standard differs

significantly those persons holding AFSC who are unable to pass the SERE occupational fitness test are only should not be considered for worldwide deployment, field operations under adverse conditions, or airborne duty.<sup>44</sup> Removal of AFSC is not explicitly stipulated in classification policies and standards as it is for the enlisted Combat Control, Pararescue, and Special Operations AFSCs. Explosive Ordnance Disposal (AFSC 3E8X1), and Tactical Air Control Party (AFSC 1C4X1) only implement an entry into and exit from training fitness standard. No classification description or Air Force Instruction requires the person to meet occupation-specific physical fitness training and testing once the individual is awarded the 3-skill level EOD and TACP AFSC.

The EOD, SERE and TACP entry into training screening standards existence do focus on finding people who can handle the doing of activities on the job better, but the recent rethink of implementing such fitness standards is more connected to the decline in recruit quality happening since 1992. Other than perhaps TACP, a prevailing dominate number of duty positions having frequent repeated role and mission risk-taking utilization in austere perilous environments has not significantly changed for these specialties.

The other robust fitness standards used by Air Force units and specialties' fulfill more of an enticement incentive nature more than being availability of dependable and reliable operational capability in nature. The standards adopted for use tend to adopt the prescribed standards of personal fitness and readiness to accomplish Air Assault missions, Airborne Missions, or US Army Ranger missions owing to the number of assigned to unit members attending courses that must comply with Army Physical Fitness Test (APFT) prerequisites. Regardless these fitness requirements are not occupation-specific classification fitness requirements the person must comply with throughout an enlistment or a twenty year career in the occupation. Consequently, the historical development of SERE, SOW, TACP, and EOD occupation-specific fitness standards gives some understanding of why a universal occupation fitness standard is impractical.

The Air Force's Survival, Evasion, Resistance, and Escape (SERE) specialty's entry classification lacked focus on combat readiness until 1996. As [Survival Training]<sup>45</sup> its primary existence purpose prior to 1996 was to provide the minimum of low risk survival training to aircrews.<sup>46</sup> Having a classification 222231K PULHES requirement the screening and selection of entry personnel emphasis oriented to determining instructor adaptability and suitability to train others more than determining the person's level of physical fitness. The 1982 decision assigning Air Force as executive agent for SERE and Military Code of Conduct training started the reengineering of the Air Force Survival Training Instructor specialty into the Survival, Evasion, Resistance and Escape (SERE) specialty. After DESERT STORM many of the highest-level Air Force leaders experienced a sudden awareness isolated personnel recovery wasn't limited to being the downed fighter pilot behind enemy lines and that such situations and circumstances was not limited to open armed conflict between nation-states. Consequently during the 1990s the instructing SERE training purpose of the specialty expanded into operations support [Augments Joint Personnel Recovery Center (JPRC), Unconventional Assisted Recovery Coordination Center (UARCC) and Personnel Recovery Coordination Cell (PRCC)] utilization, base level SERE continuation training and additional involvement with instructing basic, advanced, and emergency military parachuting. This resulted in the Survival Training Instructor specialty being renamed [SERE Operations] in 1996 and subsequently [SERE] in April 2001.

This resulted in raising the PULHES classification requirement to 111121K and the SERE physical fitness test (SPFT) standards being developed and implemented as a requirement in AFI 16-1301 SERE Program dated 6 September 2006. The AFECDS since 2007 identifies the SERE PAST as an entry classification requirement only. Currently, no other award of AFSC and retention of AFSC classification Physical Ability and Stamina requirements identified for this specialty. At some time between 1973 and July 5, 1977 the Survival Instructor Training Course was open to women. The several women entered into this training prior to July 1977 were unsuccessful in completing the required training. The first two women awarded the 921XO Survival Instructor AFSC entered training in July 1977 and successfully completed training in December 1977.<sup>47</sup>

Combat weather parachutists served in duty assignments on teams supporting 101st Airborne Corps, 82nd Airborne Division, XVIII Airborne Corps, 18th Aviation Brigade, Army Ranger Regiment and Army Special Forces. Until the 1980s the screening and selecting of getting all combat weather parachutist was a process having primary reliance and dependence on the 5-skill level weather observer or forecaster successfully completing the Army's Basic Airborne Course and obtaining basic combat infantry skills. The initial screening and selection of combat weather parachutist implemented in Detachment 75, 2<sup>nd</sup> Weather Wing during 1963 was a bit more robust of a unit run process as initial commando or special warfare weathermen selection focused on screening out weather observers and forecasters lacking the personality or willingness to endure hardship month after month more so than a formal physical and psychological assessment and screening program. Since 1963 those combat weather parachutist supporting the Army's Special Forces Groups and Army's 75<sup>th</sup> Ranger Regiment (January 1974) are considered to be Special Operation weathermen. Until about 1993 the unofficial screening and selection physical fitness requirements to be put into a Special Operations Weather duty position conformed to Special Forces Qualification Course or 75<sup>th</sup> Ranger Regiment Ranger screening and selection standards. However, the need to establish official screening and selection criteria began increasing in June 1978 with the Army opening duty position assignment for women to the 82<sup>nd</sup> Airborne. The need for official screening and selection criteria became unavoidable in April 1993 when the Air Force's removed all "combat aviation exclusion policies". This policy decision beyond any question opened all the weather parachutist coded positioned opened to women except those SEI 800 coded assignment positions supporting US Army Special Operations Forces and Army Special Forces. This resulted in B-Battlefield Airman and C-Advanced Battlefield Airman suffix being established. The C-Advanced Battlefield Airman suffix was all the parachutist coded weather duty positions of which the SEI 800 Special Operations Weather duty positions were a subset. The combat weather fitness requirement for parachute coded duty assignments was generally connected to the 17-21 year age group of the Army Physical Readiness Test (APRT) with the gender appropriate minimum score of 60 percent in each category. The SEI 800 Special Operations Weather Team requirement restructured from "requiring six months weather forecaster experience and supervisor recommendation" to "Requires fully mission qualified status for SOWT mission and supervisor's recommendation" during the 1993 to 2008 period. In July 2010, AFI 15 AFI 15-135V1 Special Operations Weather Training and AFI 15-135V2 Special Operations Weather Standardization were first published and implemented the PJ/CCT fitness standards as being the specialty's classification requirement. Interestingly the 2013 AFECDS still identified a PULHES 231221 and demonstrated 50 pound weight lift classification requirements that remain unchanged from when Special Operations Weather Team was a special

experience identifier coded duty (800-special operations Weather Team) of the 1W0X1 Weather AFSC.

The capability the TACP enlisted specify exists to provide has been in continuous human factors and capability extensibility reengineering since it was created in 1977 as AFSC 275X0, Radio Operator Maintenance and Driver. The AFSC changed to 1C4X1 Tactical Command and Control effective October 1993 and subsequently renamed 1C4X1 Tactical Air Control Party. The specialty's initial 11121K PULHES classification requirements were raised to 11111K during 2008. During 1984 and 1985 the utilization capability purpose began to expand to include the training of selected NCOs in this enlisted specialty to perform forward air controller (FAC) and Battalion Air Liaison Officer (BALO) duties. In 1990 the Air Force approved the Enlisted Terminal Attack Controller utilization which allowed qualified 7-skill level NCOs of this specialty to control air strikes without the presence of an officer. However the enlisted Tactical Command and Control specialty's original primary existence purpose of [operating and supervises communications nets to support army ground maneuver units]<sup>48</sup> didn't begin to change significantly towards required core skills to direct airstrikes in close proximity of friendly forces until many Battalion Air Liaison Officer positions were converted to 7-level with JTAC certification and qualifications in 2005. This expanded into JTAC qualifications and experience required utilization is what forced the classification vision requirements to become less flexible. TACP's battlefield utilization and availability demands since September 2001 is also influencing mission need initiatives to make JTAC a core 3-skill, 5-skill level and 7-skill level requirement. The USAF TACP specialty implemented an informal student PAST entry admission prerequisite for the Tactical Air Command and Control Apprentice Course circa 1999. Until 2006 the TACP CFETP identified the TACP PAST as an entry into training and exit from training requirement with stipulation TACP PAST standards are in lieu of scientifically grounded standards and will be used until occupational screening and physiologically sound PAST requirements can be developed and implemented. During the period from 1999 to 2006, several variations of mixed Army Airborne and Army Ranger fitness test standards proposals were proposed as being the minimum fitness level necessary to insure safety in participating in required AFSC awarding training. Much of the getting a TACP PAST approved difficulties surfaced from Air Force commissioned and enlisted members providing tactical air control support to Army's combat operations without the mission need for any robust fitness standards and annual fitness testing since WWII. Contributing to the difficulty is very few TACP duty positions are parachutist coded and more significantly two thirds or more of the duty assignments do not support US Army Special Operations Forces and Army Special Forces units or missions. Apparently, scientifically grounded standards currently exist as the September 2012 change 1 to the TACP CFETP deletes the lack of scientifically grounded PAST standards stipulation as AETC physiologist has developed or approved the TACP PAST entry classification standards. Currently no other award of and retention of AFSC classification PAST requirement are identified.

Unlike TACP, the USAF EOD implementation of its occupation-specific entry fitness standard originates more from a behavior problem of people not sustaining the level of physical fitness required to complete BMT more than from expansion into new roles and mission utilization. The USAF EOD specialty established its preliminary screening course at Sheppard AFB on June 27, 2011. The course's goal is to screen for the best candidates to put into all student allocations provided annually to the Air Force and lower the attrition rate at the Naval School Explosive

Ordnance Disposal at Eglin Air Force Base, Florida.<sup>49</sup> The Task Orientated Physical Evaluation (TOPE) was concurrently developed and implemented to help ensure all EOD technicians stay in the physical shape necessary to meet mission requirements.<sup>50</sup>

The first thing that kind of struck me was, ‘We’ve got EOD candidates graduating EOD school and failing their Air Force fitness test at their first duty station,’ ” said Schneider, the 366th Training Squadron, Detachment 3, superintendent. “That is a total recipe for failure, especially when these airmen are going to go out and get their upgrade training and immediately deploy.”<sup>51</sup>

“We do the pool training because the only Air Force EOD officer to have died in the current conflicts was Capt. Kermit Evans, who passed away when he was forced to bail out from a helicopter over a lake in Iraq,” said Capt. John Fuson, 380<sup>th</sup> ECES EOD officer in charge.<sup>52</sup>

Although an entry classification EOD PAST exists since January 2012, no other award of AFSC and retention of AFSC physical fitness and ability classification requirements or mission ready physical fitness certification policies exist.

The focus on the historical development of these occupational-specific fitness standards is not that they differ but that the historical variation the origins and the developing of these standards give understanding to why such standards have variations and why a universal mission ready or combat standard is impractical. This history illuminates that although occupations may have considerable overlap in task activities there are dimension of environment in which the tasks is accomplished combined with situations and circumstances that demand higher levels of human performance to get the task successfully accomplished.

The Pararescue and SERE specialties provide best comparison example due to the clear overlap of common core tasks but significant accomplishing differences in the nature dimensions of the environments the human performance happens.

The bulk of the dimensions of environments in which members of the SERE specialty complete core tasks connect to controlled training environments or some sort of operations center (JPRC, UARCC, PRCC). Controlling the training environment is a matrix risk reduction policies to safeguard the health and welfare of students and instructors. The operations center environments are of an administrative combat support nature in a rear area or within at least a combat support location having perimeter defenses. Whereas the bulk of the dimensions of environments in which members of the Pararescue specialty complete core tasks connect to the uncontrolled and unpredictable tactical/mission operational environment.

Training environments typically have limits, restrictions, constraints and controls imposed to avoid injuries and deaths. An example is drop zone (DZ) surface winds for training jumps will not exceed specified limits, but for operational jumps the allowable surface wind velocities become the acceptable risk to meet the unique mission needs. The training DZ is surveyed, hazards to the jumpers are removed and a drop zone party of controller and medical coverage is required. Whereas for operational jumps the DZ is not surveyed and there are no drop zone controllers or safety personnel ensuring the safety of the drop zone to include reporting surface



winds to the jumpmaster and jumpers. Besides the operational jump involving the taking on of increased risk taking by the jumpmaster and jumpers there is generally a higher degree of physical exertion of jumping heavier equipment loads and dealing with higher wind velocities, gusting winds and lower visibility resulting from lack of daylight or adverse weather.

The degree of physical exertion required on the operational jump is generally greater in expenditure and longer in duration as the purpose of the operational jump includes acceptable risk to execute a mission upon landing on the DZ. At minimum, the degree of environmental unpleasantness is greater as the location of the DZ can be anywhere globally, in any climate, and immersed in adverse weather conditions. The physical difference may include manipulating canopy control and emergency procedures while wearing bulky cold weather gear and gloves or wetsuits and dry suits. A person may be capable of performing tasks when there is freedom of choice of where and when to do the training jump, but be incapable of doing these same tasks successfully in the operational environment in the accomplishing of an operational jump.

The psychological aspects of human performance are weightier in stress pertinent to taking on risks of unfamiliar DZ and uncertain level and degree of struggling with adversities being encountered in executing the mission once the jumper lands on the DZ. Not only is a higher level of skillful abilities required in the higher degree of risk-taking, but also there is a higher psychological degree of responsibility and accountability in doing the tasks.

These psychological aspects have clearest discernible separation in the performance of jumpmaster duties, particularly as there are jumpmaster tasks and responsibilities unique too and only authorized intended for rescue jumpmasters and parachutists covered under AFTTP 3-1.8 or 3-1.8 that are not authorized for use by other personnel.<sup>53</sup>

The care taken by the drop zone party to ensure that all conditions, especially those that are safety-related are identified to the JM and jumpers doesn't exist when jumping to execute a rescue mission. The DZ's location is not preselected and is found and determined either on arrival overhead the incident location or determined by maps and photos during mission planning. It is the jumpmaster making the technical decision of does weather, terrain, climate and location of DZ give reasonable probability of inserting the rescue surface team capability onto the DZ to execute the rescue operations. The degree of task specialization is of much higher decision-making specialization than required to jumpmaster training jumps to the training DZ. The operational parachute operations of this nature requires persons' participating in such activities to have higher acquired and sustained physical and psychological abilities.

Although interrelated skills and tasks exist among various Air Force specialties (occupations) the functional level of task performance in ability to do the task on the job or in the performance of duties isn't equally transferred in nature of minimal performance abilities to do the task with acceptable survivability, efficiency, and effectiveness in the adverse operational environments. The unavoidable reality is Pararescue's occupation-specific physical ability and stamina standards and policies is the Air Force puts pararescue personnel into various operational environments to provide aid and assistance to isolated personnel in distress and immersed in adverse conditions to keep these isolated personnel alive. This mission need demands human performance survivability in all anticipated threat environments.

## - TECHNOLOGY AND ERGONOMICS -

Advances in technology since the 1940s has made doing some tasks less unpleasant and less human performance physically demanding. In doing so, these advances in technology also expanded anthropometric variation (the diversity of body dimensions that exists within and between human populations) and other human performance factors involved with job placement training and performing occupational/vocational specific work.

Accompanying the 1973 transformation to the all-volunteer military as a means to eliminate bias hindering leadership and career progression potential the various separate military women corps (Women's Army Corps, Women's Air Force Service) organizational arrangements were discontinued. As more and more military occupation specialties opened to women during and after the 1970s both physical fitness standards and training standards shifted to accommodate the anthropometric diversity range from a 5<sup>th</sup> percentile woman to a 95<sup>th</sup> percentile man. This target training population impact of instruction should be student-centered in fostering advanced both probability and potential for an inadequate or insufficient training system producing students who can't perform required occupational activities safely. The potential training system failure causal isn't the body morphology variations (gender differences, age differences, and ectomorph, endomorph, mesomorphic body shape differences) but use of technology available encouraging student-centered instruction pass/fail standards orienting towards being technical competence and task performance in the risk-limited or risk-controlled training environment rather than performing activities of occupation safely and with reasonable survivability in physically demanding and multi-tasking hi-risk environments. Simply, there is reluctance in military job placement training to use occupation-specific human factors to fail passing marginal students.

It should be noted the majority of military occupations (Army, Navy, Marines, Air Force, and Coast Guard) lacked specific career occupational-fitness standards to ensure the better fit personnel were accepted into required entry job placement training and retrained in the occupation to frequently and routinely perform physically demanding duties and activities. The relied on career fitness standard are common normal distribution health based fitness standards. Because of this, having adequate or sufficient level of physical fitness is seldom considered an appropriate occupational-career subskill needing to be in place to safely perform duties of a physically demanding occupation. It should also be noted many military members are in constant fear of the annual body fat measurement and health based fitness test because of fear of failing it.

Although height, weight, and body fat standards are service specific, the general 5<sup>th</sup> percentile women to a 95<sup>th</sup> percentile man stature (standing height) anthropometric standard for initial enlistment in the Armed Forces are contained in AR 40-501, chapter 2.

The causes for disqualification are—

- a. Men: Height below 60 inches or over 80 inches does not meet the standard.
- b. Women: Height below 58 inches or over 80 inches does not meet the standard

The fitness performance standards for entry into and retention in military service also generally reflect a 5<sup>th</sup> percentile women to a 95<sup>th</sup> percentile man human factor performance standard. This

is evidenced by separate physical fitness standards (Army PFT, Air Force Fitness Test and etc.) existing for each gender. That these tests also have different standards for age gives further evidence these tests emphasize normal distribution health based fitness standards and deemphasize or completely ignore having purpose to ensure that personnel in such physically demanding occupations can actual perform task and mission safely, effectively and efficiently in the operational environment. This caused dependence on adopting the Army Physical Fitness 17 year to 21 year age group standard being the prerequisite physical performance tests and standards for job placement training and special qualification training considered to be physically demanding. Unfortunately there is often no requirement to sustain higher fitness levels once the job entry training or special qualification course is successfully completed as mission-essential tasks in many military occupational duty assignments do not require the service member to sustain this higher level of fitness even for leadership and career advancement purposes.

The direct correlation existing between risk management and physical toughening and psychological preparation has critical importance needing identification.

Risk management pertinent to surviving and successfully accomplishing the mission always depends on selecting the right or best person. Unfortunately, the inherent deficiency of most risk management policies is such selecting the right or best person gets diluted with inclusion of diversity desires having complete general lack of concern to acknowledging that sometimes emphasis on human performance being effective, dependable, reliable and competent when interacting with machine, tool, or equipment and getting tasks safely done in the physically demanding and often concurrent psychologically compromising operational environment is necessary.

Minimal, if any, operational risk management guidance gives any concern to divulging about how and why Knock-it-off & Time-out concepts that work successfully for human performance deficiencies in training environments cannot be implemented effectively in the less predictable operational environment where the flow and introduction of detrimental events, actions, activities and phenomena are less controlled, less avoidable, and often unstoppable. In the operational environment a progression of activities point is reached where the risk acceptance decision (gamble) cannot be removed or retracted to cause partial or complete stop of activities.

Insignificant operational risk management importance is given to fixing some attention on emphasizing variation in body size, weight, arrangement and structure can disrupt and hinder human performance interoperability with machine, tool, or equipment and getting tasks safely done in different operational environments. This results from peacetime complacency that almost always allows partial or complete stop of activities when activities are no longer proceeding as expected or planned. If inadequate and insufficient human performance is involved the direct contributing causals are often attributed to inadequate training that does have a fixable solution and not variation in body size and body characteristics that identify being unsuitable to be put into the operational environment to do something as training cannot make the person able to function effectively and safely in the operational environment.

There are limits to how much technology can contribute to the reinforcement of human performance adaptability and the bolstering of human psychomotor performance and still allow the human performance survivability in the obtrusiveness of multitasking that relies on the

individual or small group taking immediate or near immediate action to mitigate risk(s) for themselves in Real-Time. Military parachuting and military diving duties perhaps demonstrates the human performance interoperability with technology paradox best as new textiles, new composite materials, and improved system designs have made equipment and devices lighter, less bulky, and less prone to malfunction and less physically demanding to use or frustrating to use in time sensitive situations. Both military parachuting and military diving involve high risk training in that at some point the training activity is committed to and must run its progression of activities. Unfortunately, it must again be emphasized that the many potential physiological and psychobiological variations (includes body size, weight, arrangement and structure) of the human body often still hinder best intentions and efforts in developing devices and equipment that accommodate all possible human physiological and psychobiological variations.

Improving and continuous new developing technology had certainly reduced the physical demands of performing many military activities by the 1970s. For example, the transition from M-14 and M-1 rifles to the M-16 rifle/M-4 carbine and the transition from .45 caliber semi-automatic pistol to 9mm semi-automatic military pistol certainly better accommodated smaller hand sizes and slighter torsos. The lesser weight of these weapons and recoil resulting from firing these weapons also lowered the psychomotor ability demand in the effective and efficient aiming and firing of these weapons. However, the weapon qualification standards for most military occupations remain limited to shooting a motionless paper target shooting on a training range that lacks multi-tasking, physical excursion, and an adverse environment. Consequently, the person is trained to have the technical ability competence in the task of aiming and firing a weapon, but lack the ability to competently perform the task in the multi-tasking adverse operational environment.

Advancements in technology combined with the all-volunteer military transformation that began in 1973 brought with it a less than harmless operational disconnect in training controls and standards. Training became peace-time minimums oriented and less preparing for operational utilization minimums oriented. Eliminating or reducing time spent on activities irrelevant to training objectives unrelated to the occupation or duty often converted into eliminating what is not required in all duty assignment positions and or for all students of various military occupations attending a joint services basic qualifications course. Compromise to operational utilization training controls and standards increased as the services depending on an all-volunteer military force structure began using some basic qualification courses as collateral duties opportunity rather than as an operational capability/mission need requirement. The Army in particular began assigning promotion points to qualification badges and tabs (parachutist, Ranger, Special Forces and etc) and using such courses as enlistment/reenlistment/duty assignment inducements/enticements. The result is large numbers in the force structure that are competent enough to perform adequately in the training environment but who are unable or unwilling to perform in the multi-tasking adverse operational environment.

The large scale wartime (not training) airborne assault depends on expedience of putting large numbers of static line parachutists on the width and length of the combat drop zone with dispersal on the drop zone to conduct effective offensive and defensive combat activity upon landing on the drop zone. Multiple drop planes are staggered in formation with mass exit of parachutists over the drop zone from aircraft flying at altitudes from 200 feet to 800 feet above the ground. The lower the exit altitude to the ground the less time for canopy control,

responding to equipment failure (line twist, collisions, and emergency reserve activation) and preparation for landing is available to the parachutist. Besides drop zone factors, the determining of start of mass exit and stop of mass exit points depends on a common parachutist under canopy decent rate which translates into a statistical mean drift rate needed to determine release points off set needed because of descent drift caused by wind velocities pushing the descending canopies and parachutists.

The technological evolution of parachute systems by the mid-1970s made performing military parachuting duties both less physically demanding and safer. Apex vent design reduced both opening shock and canopy oscillations during descent, anti-inversion net reduced probability of canopy inflating partially or not at all, tensile strength and porosity properties of new canopy textiles reduced both probability of rips and tears during opening sequence and also were more effective in retarding the parachutist rate of descent. Certainly the introduction of the capewell release in lieu of the single-point release box and T-10 canopy between 1952 and 1960 allowed less psychomotor effort to jettison the parachute canopy to prevent being dragged across the ground when wind is blowing. The control lines of the MC-1B (a steerable parachute replacing the T-10B during the 1970s) eliminated the strength and endurance needed to perform riser slips to turn the direction of the canopy. Less upper and lower body strength needed to deal with parachute landing and less weight and bulk of equipment accommodated safer use by individuals of smaller stature and less strength.

“The new V-slot parachute ... The new parachute definitely is safer to use by virtue of its decreased opening shock, its slower rate of descent, and its much slower rate of oscillation. Therefore, from the jump safety point of view, it is desirable to use the newer parachute exclusively as soon as enough are on hand. Two recent accidents would probably never have happened if the new parachute had been used instead of the old E-1.” – August 1956<sup>54</sup>

The all-volunteer military need to attract recruits combined with the women’s integration into airborne combat support units introduced the existence of the airborne trainee physical fitness test for men and for women in 1974<sup>55</sup>. Although the test consisted of pushups, bent leg sit-ups, chin ups, knee bender and one mile run the test for women utilized a modified bent leg sit-up and an inclined chin-up in place of the bent leg sit-up and chin up<sup>56</sup> as the airborne combat support duty positions allowed a lower degree of physical fitness than Army Airborne Infantry duties required. The women were required to complete the 1 mile run in 10 minutes or less. The airborne physical fitness test for men and women was replaced in 1980 with the male/female Army Physical Fitness Test requiring a score of 180 points (60 points in each event) using the 17-21 year age group scale for the appropriate gender.

In 2011 the U.S. Army began replacing the MC-1 troop static line parachute system with the non-steerable T-11troop static line parachute system. The T-11 canopy was intentionally designed to be 25% larger than the T-10 and MC-1 canopy for purpose reduce landing injuries by 75% for every 3000 jumps by lowering rate of decent. Although designed to fit body sizes from the 5<sup>th</sup> percentile female (standing height 59.6 inches, weight 108 pounds) through the 95<sup>th</sup> percentile male (standing height 73.4 inches, weight 225 pounds), the interoperability with human performance didn’t reliably accommodate the 5<sup>th</sup> percentile adult female.

Several mishaps during 2011, 2012 and 2013 revealed contributing cause of the mishap was parachutist lacking sufficient upper body strength to riser slip maneuver the non-steerable T-11 (no control lines) and that the 5<sup>th</sup> percentile female weight allowed too much driftage resulting in unavoidable off drop zone landings. Effective November 2013 the requisite BAC fitness test was changed<sup>57</sup> to include being tested on the flexed arm hang with requirement to maintain the flexed position for at least 10 seconds to be admitted into the course. Applicants must also be able to complete a 5-mile run within 45 minutes 30 days prior to the class start date. In addition, a new weight requirement of students must weigh 110 pound or more was added.

A small special-mission team parachute insertion to perform reconnaissance, pathfinding or a rescue differs significantly from the large unit airborne assault operation. The drop zone is unmarked and there is reception or control party on the mission drop zone providing wind and other information to the aircraft, jumpmaster, and parachutists. Unlike the large unit airborne assault maximum allowable wind velocity and minimal acceptable weather conditions, terrain or sea state, elevation depends on the experience and ability of the team and urgency of the mission. Presence of shrub brush, thickets, small trees and tundra areas are not considered hazardous to the jumpers. The exit point is determined precisely so that the parachutist can use driftage and canopy steering control to land on the constricted drop zone. The parachutist put on the ground also perform and accomplish potentially for days without any reinforcement and knowledge immediate emergency extraction is unlikely. Significant forced overland foot march or long distance swimming are high probability activities. In a 50% mixed gender population the 5<sup>th</sup> through 95<sup>th</sup> equipment design percentile covers 90% of people (the top 5% and bottom 5% are excluded). Unfortunately this applies to design interoperability and not a universal human performance standard and consequently human performance is the greatest variability and so of the majority of risk. In most physically demanding special mission team parachute insertion situations and circumstances any anthropometry (measurement of the dimensions of the body and other physical characteristics) below the female 50% percentile (standing height 64 inches, weight 137.5 pounds) and below male 5% percentile (standing height 66 inches, weight 140 pounds) is an increased functional (in motion or engaged in a physical activity) anthropometry utilization risk. Demographically the average American women's height is approximately 64.2 to 64.6 inches (approximately the adult female 75<sup>th</sup> percentile) and the average American male's height is 69.7 inches (approximately the adult male 50<sup>th</sup> percentile). What this means is males are typically taller than females with most adult American women having a standing stature equal to or less than 66 inches. Although the standing height and weight anthropometric dimensions are independent of and do not have a correlate with other anthropometric measurements, anthropometry differences do significantly influence physical performance capacities (running, jumping, climbing, throwing and dodging) and performance effectiveness consistent with mission objectives in the operational environment.

The transition to the all-volunteer military has introduced a goal conflict between the goals of access to career and training activities is equitably available to all and the goals for any mission or activity is to operate safely and achieve success. Unfortunately the operational reality that some of the mission parameters or circumstances are forcing higher risk to successful mission/activity completion is often abandoned to meet diversity goals and agendas. The belief hinges on risk may be reduced by transferring all or some portion of that mission or task, to another individual, unit or platform that is better positioned, more survivable, or more

expendable.<sup>58</sup> This contributes to initial training and qualification course eliminating training control standards that is not necessary for all occupations and duty positions.

A reengineering of performance standards occurring between 1970 and 1975 having a damaging result happened 1974. The United States Navy concurrent with its decision to move the SCUBA qualification course from Key West Florida to San Diego, California had decided equitability training for all required deleting the 1,500-yard night swim, night SCUBA navigation swim and most physical fitness standards and training from its curriculums. This resulted in all pararescue pipeline students attending the Special Forces Combat Diver Course since early in 1975.<sup>59</sup> This course remained the primary source for gaining pararescue occupation required combat diver qualification until the Air Force created and established its own Combat Dive Course in 2004.

A December 1974 response from the U.S. Navy in response to a HQ ARRS/Director of Operations voicing concerns of training no longer meeting pararescue operational requirements stated Navy Diving courses was in the business of “training divers to go off a boat, go down and complete their assigned tasks and return to the boat. We’re not out to train a bunch of gorillas.”

Some basic qualification courses have appearances of providing comparable necessary skills, knowledge, and attitudes to do the job, but actually have different minimal standards of optimized human performance necessary to achieve to graduate the course. For example the Naval Diving and Salvage Training Center conducts Scuba Diver, USMC Diver, and USAF Combat Diver courses. All three courses have common purpose of to provide qualified non-diving personnel with the basic instruction and training in SCUBA diving techniques, inspection, search, and underwater procedures to safely and effectively perform as a dive team member and SCUBA diver. All three have rigorous training programs, but is casual for the training controls pertinent to human performance and critical core-skill task proficiency standards to differ is the SCUBA course graduate is likely to be performing diving duty as secondary to the service members primary career occupation/specialty in a support role (collateral duties) of some sort. Whereas the USMC Diver and USAF Combat Diver course graduates are expected to have the capability and ability to successfully complete the dive mission or dive task in extreme or extraordinary operational environments on arrival at first duty assignment.

Pararescue dive operations are invariably the province of a small team parachuting in, or low and slowing from a helicopter, or from a small watercraft or inflatable boat in a remote area as rapid response to accomplish some sort of rescue or recovery operation. It is crucial basic diver qualification training on the student obtaining and sustaining situational awareness in the multi-tasking adverse operational environment and obtains the performance adaptability to accomplished mission and task in adverse weather, sea states, and in cold water below 37° Fahrenheit/2.7° Celsius. Accordingly, establishing basic dive course qualification training controls and standards to successfully train the 5<sup>th</sup> percentile women to a 95<sup>th</sup> percentile man general population demographics percentile distribution (90% of all potential students/trainees) rather than training to the operational capability mission need increases the exposure of personnel participating in accomplishing high risk mission or task to unnecessary and avoidable risk.

The August 17, 2006 USGCC Healy Dive Accident<sup>60</sup> and the February 26, 2013 Mobile Diving and Salvage Unit 2 (MDSU2), Dive Accident at Aberdeen Proving Ground's Super Pond<sup>61</sup> illustrates facets of performance under pressure and operational risk conflicts arising from required job entry and basic qualification course training controls and standards emphasizing removal of all human performance factors that are not designed for the average person (general population demographic norms) for purposes of removing proportionally different ethnic and gender physical characteristics that potentially cause leadership development and career progression bias. Both accidents involved some degree of noncompliance with skill sustaining proficiency and noncompliance with published diving operations policies and safety guidance. The official inquiries into both accidents clearly assert conclusive judgments the dive operations should never have been allowed to happen, but avoid any considering or determining if job placement courses and special skills qualification courses lacking simulated operational environment competency and proficiency performance criteria could and can be contributing causes.

On August 17, 2006 two divers from the Coast Guard Cutter Healy died attempting a cold water familiarization dive in minus 29 degree Arctic water 490 nautical miles north of Barrow, Alaska. The only divers assigned to the Healy's crew compliment at this time were collateral duty divers. Collateral meaning diving wasn't a primary occupational duty for them and none of the three divers had accomplished a cold water SCUBA dive. All were limited experience military divers with most if not all the experience obtained by completing basic dive qualification courses. One of the deceased divers was the ship's ships Diving Supervisor who qualified as a Basic Diving Officer on 11 May 2004 from the Naval Diving and Salvage Training Center after completing the four-month Basic Diving Officer Course (most likely the Second Class Diver Course). This diver completed very few dives with indication most of the dives being recreational in nature and not operational after completing the basic qualification course. This diver's currency qualifications had lapsed on 15 May 2006 for not accomplishing a dive during the previous six months.

The evolution of diving technology particularly during the 1970s (single hose regulator replaced dual hose regulator, adoption of buoyancy compensator, introduction of the variable volume dry suit valve, introduction of environmentally sealed first stage of the two stage pressure demand regulator) reduced the difficulty and frustration of using dive equipment and improved the divers comfort when immersed in and under water. Even so, dry suit and under garments are bulky and involve significant weighting and buoyancy difficulties to struggle with even when configured and worn properly. Under water proper buoyancy is achieved by adding air to the dry suit and venting air from the dry suit. This means the diver must pivot to orient the variable volume dry suit valve when venting air is necessary to sustain proper buoyancy. The diver must also sustain situational awareness of how much air remains available to put into the dry suit while descend to sustain proper neutral or slightly negative buoyancy. These are not simple skills to be learned during an open water dive of the nature being conducted by divers of the Coast Guard Cutter Healy on August 17, 2006.

Although the official inquiry causal mishap finding appropriately focused on significant management and supervisory complacency and negligence the contributing cause of the basic qualification courses not giving the necessary training needed to perform mission and task in the operational environment is somewhat concealed. What the USGCC Healy Dive Accident



inquiry fails to explicitly address is the possible task performance differential existing between being trained and qualified to safely use devices, tools and equipment in the training environment and effectively using the tools, devices and equipment in a physically and psychologically demanding operational environment to complete the mission or task. Simply, the Healy dive mishap resulting in two avoidable deaths clearly demonstrates the danger of training controls and standards favoring to train the 5<sup>th</sup> to 95<sup>th</sup> mixed population demographics (90% of potential students/trainees) percentile distribution and then putting such inexperience and lack of expertise individual in a critical (dive officer/dive supervisor) leadership and risk managing decision acceptance and advising position. To a lesser, but still significant causal degree, the favoring to train the 5<sup>th</sup> to 95<sup>th</sup> mixed population demographics put the only other individuals with supposed dive qualification into participating in a high risk dive operation they lacked the training, experience and expertise to recognize and identify known hazards/risks. This accident was not an equipment failure, but a human interoperability with technology failure and more importantly reliance on successful completion of the basic qualification course providing the minimum level of competency necessary to plan, supervise and participate in doing a cold water dive.

To what extent functional (in motion or engaged in a physical activity) anthropometry contributed to the Coast Guard Cutter Healy dive mishap is unknown. Generally, the desirability that human performance has sufficient survivability-and-reliability in operational environments designates both potential and probability of contributing anthropometry causals. Unfortunately, studies to determine how long swimmers can sustain 75% of maximum velocity or the distance reasonably fit swimmers can effectively tow or drag a survivor or a basic combat load are lacking. However the best male swimmers tend to perform better (swim faster) and have a better distance physical exertion capacity to tow or drag a survivor or equipment compared to the best female swimmers. While some of the differences can be attributed to male swimmers having greater aerobic capacity (VO<sub>2</sub>max) compared to female swimmers, there is much more static (structural) anthropometry variability (skeletal dimensions - measures distance of bones between joint centers, soft tissue measures in contour dimensions and bulk) present in both genders that influence the extent of possible functional human performance a person is capable of.

On February 26, 2013 two divers assigned to MDSU2 died attempting a deep water (150 feet depth) dive for training in preparation for a deployment overseas. The subsequent investigation focused on the condition of equipment used by the divers, the 38 degree temperature of the water, and underwater visibility a foot or less. The planned dive operation to depth of 150 feet exceeded the normal military scuba working limit of 130 feet and ignored general guidance policies of scuba dives below 130 feet are conducted only in cases of “operational necessity.” Very little mentions or speculations of the deceased divers’ dive experience other than one completed dive training in April 2008 and the other completed dive training in February 2009. The subsequent court-martial conviction of the Senior Chief Diver supervising the diving training that day of a single charge of negligent dereliction of duty clearly indicates his failure to see the risks of the dive or take steps to mitigate them. It was also clear regulators used had missed routine maintenance checks and after accident, testers found the regulators were not functioning properly. However the deceased divers and others involved in the diving operation that day were clearly performing task and operations outside of their normal working and training limits.

It is unlikely functional (in motion or engaged in a physical activity) anthropometry contributed to the MDSU2 dive mishap, but the participating in dive operations outside of normal working and training limits strongly suggests some form of to train the 5<sup>th</sup> to 95<sup>th</sup> mixed population demographics and passing performance proficiencies being distanced or perhaps disconnected from specific occupational-fitness performance standards connected to doing task and mission in the operational environment had some contributing cause.

The desirability is human performance should have sufficient survivability-and-reliability in operational environment. Inadvertently the evolution of technology to some degree while enhancing human performance effectiveness also shifts down (reduces) minimal level of human performance factors needed to gain skills to perform mission and task in favorable environments but simultaneously compromised the acceptance-rejection line of human factors<sup>62</sup> performance training controls and standards connected to the higher quality of optimized human performance to do mission or task in harsh and perilous environments. Simply technology evolution designed to accommodate from the 5<sup>th</sup> percentile female (standing height 59.6 inches, weight 108 pounds) through the 95<sup>th</sup> percentile male (standing height 73.4 inches, weight 225 pounds) has subtle effectiveness of human performance and survivability of operational human performance capabilities risk tradeoffs.

Effectiveness of human performance connected to survivability of operational human performance capabilities simply means there is an acceptance-rejection line of human factors<sup>63</sup> performance. Critical to sustaining adequate performance in physically demanding operational environment is the body's inherent ability to recuperate (regain sustainable performance ability) rapidly after physically demanding activities of several hours or longer durations with minimal rest periods and sleep. Furthering the inherent ability to recuperate are human performance factors of physical strength, endurance, and bodily composition to absorb impact forces and other trauma without becoming ineffective in performance (incapacitated).

Psychological compatibility (behavioral and attitudinal) is as critical as a human performance factor as is physical strength, endurance, and bodily composition in time-critical operations relying on the individual or small group taking immediate or near immediate action to mitigate risk(s) for themselves in Real-Time.

While requiring only minimal task performance competencies and proficiencies is morally and ethically acceptable for task performance in benign workplace environments is often an inadequate moral compass and insufficient level of ethical courage that increases risk of mission and task failure in the operational environment. Morally and ethically identifying and adhering to what constitutes obtaining and sustaining minimal effective and survivable performance in the high-risk activities accomplished in the operational environment involves a different exercise of moral competence and ethical courage.

Utilization of Pararescue personnel to execute a mission always involves a decision to accept risk and the mission typically is a high risk endeavor. Therefore, the better prepared individuals are prior to an activity, the more survivability they have and stronger the potential for executing the mission and task successfully in complex situations and difficult circumstances. Unfortunately even when trained and qualified some people due to attitudinal-motivational causes or due to inadequate interoperability with technology used to accomplish the mission or task are more

prone to accidents than others while performing tasks in the multi-tasking adverse operational environment where and a higher level of task proficiency performance is required.

The context attempted to be made is the making occupational-specific and hazardous duties qualification training accessible and available from the 5<sup>th</sup> percentile female (standing height 59.6 inches, weight 108 pounds) through the 95<sup>th</sup> percentile male (standing height 73.4 inches, weight 225 pounds) and believing a fitness test alone adequately determines sufficient the minimal or better functional (in motion or engaged in a physical activity) anthropometry and human performance necessary for consistent reliable and dependable successful performing mission and task with strong survivability probability in the higher than normal risk operational environment is making decisions in-ignorance or out-of-ignorance. While it is cost-effective to dilute training to focus on technical competency and in-the-training environment performance, it is the performing of tasks with survivability and success reliability in the multi-tasking adverse operational environment that drives any necessary screening and selection requirements.

The pervasiveness of evolving technology into extreme sports and recreation activities builds assumptions and beliefs these activities have mutual human performance factors attributes that directly connect or transfer to possessing the minimal or better human performance capacity and ability to do mission and task in the high risk operational environment. Unfortunately, not only does the sporting and recreation environment significantly differ from the high risk operational environment the interdependence correlation of human performance factors between sports/recreation environment and the high risk operational environment seldom exists. Being the best athletic competitive swimmer doesn't necessarily transfer psychologically and functionally anthropometrically to being suitable to perform combat swimmer or combat diver duties. Being the best athletic competitive runner doesn't necessarily transfer psychologically and functionally anthropometrically to being able to carry equipment loads on forced on-foot overland travel over rough and through adverse terrain with the endurance to fight or perform other activities immediately on reaching the mission objective.

For screening and selection to be effective it must target and must be relevant to the desired human capabilities mission and task performance needed in the operational environment. Although joint or multi-service training has attractiveness of lower training cost efficiencies, the inclusiveness of such training environments compromise training controls and standards. This compromise increases the probability of graduate lacking the human performance capability and ability to perform essential core-tasks in the multi-tasking adverse operational environment. It is the performing and accomplishing in the harsh and perilous operational environments that exposes human performance interoperability with technology difficulties, such as for example pulling an emergency parachute rip cord while wearing extreme cold weather clothing and gloves or operating the variable volume dry suit valve while wearing bulky gloves.

Although Air Force risk management policies and guidance emphasize risk management being a process and practice "to prevent the accidental loss of personnel, facilities, weapon systems, and equipment during peacetime and wartime", there is an unavoidable demarcation between accepting risk in training endeavors training accepting risk in operational endeavors. The nature of the formal qualification course training environment is it allows through review of training plans and training activities to identify and eliminate risk and is most favorable to Knock-it-off & Time-out concepts that almost always allow partial or complete stop of activities when

anybody involved identifies concerns or informs others of a developing hazardous situation. These nature influences of being a training environment extend into advanced training courses and in-unit on-the-job training.

**“Accept no unnecessary risk.** Unnecessary risk comes without a commensurate return in terms of real benefits or available opportunities; it will not contribute meaningfully to mission or activity accomplishment and needlessly jeopardizes personnel or other assets. All AF missions and daily routines involve risk. The most logical choices for accomplishing a mission are those that meet all mission requirements while exposing personnel and resources to the lowest acceptable risk; take only those risks that are necessary to accomplish the mission or task. However, we cannot and should not be completely risk averse; even high risk endeavors may be undertaken when there is a well founded basis to believe that the sum of the benefits exceeds the sum of the costs. Balancing benefits and costs is a subjective process and tied intimately with the factors affecting the mission or activity; therefore, personnel with prior knowledge and experience of the mission or activity must be engaged whenever possible in making risk decisions to ensure a proper balance is achieved.”<sup>64</sup>

“Although the goal for any mission or activity is to operate safely and achieve success, all Airmen must consider the possibility of abandoning the mission or activity if the situation appears too risky or too costly to continue and there are no reasonable options or strategies to change/alter the circumstances in the time remaining to conduct the mission/activity.”<sup>65</sup>

Operational capability provided by trained and qualified pararescue personnel is not a device or a piece of equipment, but often does involve human performance interoperability with equipment, devices, and tools. This operational capability is trained and qualified persons accepting the level of risk appropriate to the mission and performing tasks and skills effectively and efficiently. It’s the obtrusiveness of multitasking and lack of opportunity to abandon or terminate mission activity once it has commenced that separates of the operational environment from the training, support and recreational environments. Basic qualification training courses for military occupations provide function of being an operational capability must morally and ethically be concerned with improving human performance survivability in the operational environment.

Unfortunately, most military occupations have related civilian occupations with performance standards mirroring the civilian workplace more so than being concerned with the obtrusiveness of multitasking and nature of operational environment. Although performing concurrently physical demanding and cognitive activities in a controlled training environment is a valid training activity variation in body size, weight, arrangement and structure can cause less ability that cannot be improved or corrected sufficiently through training.

“There are specific biological differences in circulating hormones during stress that explain why some students are more focused, more clear-headed during stress, and show more accuracy in cognitive and memory tests after stress. For example, students who do well release greater levels of dehydroepiandrosterone

(DHEA, a steroid hormone that can convert into estrogen and testosterone) and of NPY during stress than those who do poorly. These individuals are more accurate in descriptions of what they encountered during stress. These studies can help us develop specific interventions to enhance operational abilities (Morgan, Southwick, et al., 2004).”<sup>66</sup>

Any biological differences in circulating hormones are irrelevant as the students’ performance is either sufficient or insufficient in meeting and exceeding task performance standards. What is relevant is limiting occupation-specific fitness training and testing standards to only measures of aerobic power or muscular strength inappropriately ignores the human performance factors necessary for survivability in the operational environment while performing multi-tasking activities effectively and efficiently in operational environments. A person’s ability to run and swim distances sufficiently and accomplish impressive repetition numbers of cardiovascular and calisthenics exercise does not assess body’s structure functioning capabilities and ability to provide adequate human performance of tasks and skills in the operational environment.

The many potential physiological and psychobiological variations (includes body size, weight, arrangement and structure) of the human body indicates anthropometry is a scientifically valid personnel screening and selection risk control tool consistent with mission objectives in the operational environment and for optimizing use of available resources (manpower, material, equipment, funding, time). It also means suitability to be trained or classified into a military occupation is determinable in terms of various effectiveness/cost ratios (costs to recruit train/qualify, costs sustain task proficiencies, early attrition costs, many month loss of mission ready availability costs, compromised survivability in the operational environment costs). Consequently, a 5<sup>th</sup> percentile female (standing height 59.6 inches, weight 108 pounds) through the 95<sup>th</sup> percentile male prerequisite student applicant training control may and can be a compromising and ineffective risk control. Such a screening and selection control may and can also significantly increase various effectiveness/cost ratios. Perhaps the more useful or appropriate risk control tied to operational capability mission needs would be a female anthropometry 50<sup>th</sup> to 95<sup>th</sup> percentile range and a male anthropometry 5<sup>th</sup> to 95<sup>th</sup> percentile range?

## PHYSIOLOGICAL INFLUENCES

Functioning capability of the body in the operational environment also has a psychological component. Compelling high levels of human performance is a corresponding high level of motivation. Motivation means possessing a willingness to be there contributing in a goal directed way. A person may sufficiently perform in the training environment but not have the commitment and conviction necessary to perform in the operational environment. Such willing to perform in the training environment, but unwillingness to perform in the operational environment as a potential behavioral problem is evidenced by policies that revoke awarded aviation, parachutists, EOD, dive, air assault and other badges for willful dereliction in the performance or a cowardice refusal to perform duties the qualification badge represents.<sup>67</sup> The context of revoking badges is to demonstrate physiological influences exist without delving into theories of motivation.

Whether the motivation is a conscious or unconscious cause is also unimportant other than occupations such as pararescue attract volunteer applicants who have ignorance of the reality of performing Pararescue duties. This ignorance” has the aspect of acting in-ignorance or acting out-of-ignorance. Out of ignorance is being unaware (has a preconceived imaginary idea about the job). In ignorance is being incompetent (lacking ability to do). While ignorance of unaware or incompetence can certainly be involved in exercising the choice to quit, the psychological dimensions of ignorance is actually a bit more complicated.

The performing of pararescue duties and rescue activities is a mental risk assessment done real time where there is normally little or no time to perform or conduct deliberate risk management planning to mitigate hazards and dangers in the new or changing situation. A high degree of psychological resilience ability is needed, but to act and accomplish in a goal-directed was still demands motivation. The psychological complication is the person with the lesser bodily function capability can and will have the commitment and conviction to stay the course and succeed in attaining the original goal and objective while the person having the more suitable bodily function capability can and will quit. Thus, a basic qualification course that utilizes training standards that considers task performance in the operational environment gives the student the opportunity to resolve any conflicting motivations. To some degree, the Pararescue Indoctrination Course and other courses required for award of AFSC is the opportunity for the person to discover and resolve conflicting motivations and misperceptions of the realisms of performing tasks in the operational environment.

There are statistical aspects of the entry classification PAST standards for five enlisted AFSCs (PJ, CCT, SOW, SERE and TACP) and student attrition rates that compromised motivation has more cause for high student attrition than rigorous physical training activities and occupation-specific fitness testing. AFSCs such as SERE, EOD, TACP differ most noticeably from Pararescue PAST in surface and underwater swimming requirements. There are also differences in run and calisthenics event requirements that are less robust than the Pararescue PAST requirements, yet these AFSCs experience high training attrition rates. This is certainly evidence standards for fitness is not the attrition problem and implementing generic all-encompassing performance based gender independent fitness test standard for all AFSCs is not necessarily the solution.<sup>68</sup> The performance basing must include some level of survivability consideration for doing core tasks in the operational environment. The performance basing must also be career oriented rather than limited to an entry requirement when pay-grade and skill advancement in the occupation doesn't reduce demand on sustaining mission ready certification to be there performing duties in the operational environments.

## **GENDER DIVERSITY AND DURATION OF CAREER INFLUENCES**

Much social engineering efforts are being used to optimize gender diversity opportunities with many arguments being more concerned with political correctness than factual correctness. More detrimental however is the work paradigms focus on can do at a given time rather than on availability to can do for the duration of one enlistment or the career duration of multiple enlistments. Much of the controversy intensity focuses on the developing and implementing gender-neutral combat fitness standards. One concern is rigorous fitness standards will have an adverse career impact against females when the fitness standards and fitness test are not

demonstrated to be job related. The conflicting concern is fitness standards allowing gender or body height-and-weight allowance (handicap assignment) factors similar to current age allowance factors undermines survivability of the small tactical unit in combat. In this social engineering controversy, even height and weight standards become inappropriate unless a relationship to job performance is established.

Much interest and effort is pursuing the development and implementation of a universal combat fitness standard that while providing a sociotechnical engineered solution for career development fails to implement any occupation specific physical and cognitive ergonomic standards necessary to sustain survivability and effective performance in the operational environment. While a universal combat fitness standard can span the twenty years or more of a career in the military, such a standard sociotechnical engineered to accommodate the minimal acceptable fitness for the least physically demanding combat in nature military occupation. A common (universal) combat fitness standard compels conformity to a fitness standard that is not occupation specific and is inadequate to be used as an occupation-specific acceptance/rejection pre-classification selection standard. Military occupation-specific pre-classification fitness requirements and mission-ready fitness standards address operational risk management concerns that all members of the occupation possess optimal human performance and sustain availability for rapid response to a critical incident or a crisis location to deliver distinctive human performance capability with unequalled accuracy, responsiveness, flexibility and persistence. Such standards exist to ensure availability of operational capability and are not career development or career progression fitness standards.

While the diversity goal and progression objectives to increase occupational/career opportunities for women lacks nature of inappropriateness and incompatibility, it is difficult to determine minimal fitness standards for the combat environment that also reduces obsolescence in the occupation resulting from loss of ability to sustain adequate combat fitness during the twenty years or more that span a military career. The general purpose of any occupation-specific fitness tests is to ensure the person is putting in the effort to maintain an adequate level of physical fitness. What is typically fitness tested is submaximal performance rather than maximal performance as maximal testing being more strenuous involves higher safety risks due to the high exertion required. These physical ability standards and connected fitness tests are also incapable of testing for the person's level of motivation to perform tasks in the operational environment.

Generally, military occupational career patterns lack sufficient anchor to a static minimal level of human performance necessary in operational environments. In most military occupations the nature of human performance connected with promotion as time in service progresses (age increases) drift towards removal from required being put into the operational environment. This results in the job related being there doing something becoming less physically demanding and influence and age allowance (handicap) in most physical fitness test standards. Simply most career progression models presume movement into higher responsibility supervisory and managerial positions that shift to cognitive human factors being more important than physical human factors.

The general military career model of get-promoted or get-separated while having intent to prevent or alleviate the amassing of an obsolescence force structure on the payroll tends to avoid

using occupation-specific fitness standards to achieve these objectives. The military career model relies on retention control (selective continuation) points to achieve that manifests in many military members as get-promoted or get-separated anxieties. The simplistic purpose of the get-promoted or get-separated career model is making room for new entry-enlistment recruits to perform a specific job and competitively (selectively) promoting a few to retain in military service to move up into supervisory, managerial, and director-end executive type positions. The military career model in this perspective doesn't exist to develop and advance any specific persons career but to sustain a fit, ready, and motivated to fight uniformed armed forces.

Nevertheless, there is a lack of sameness among the variety of military occupations relatable to the frequency and duration risk of putting members of the occupation into particular harsh and physically demanding environments. The harshness and extent of physical demands existing in the combat environment also differ significantly among the variety of potential direct ground combat, ocean and near shore naval combat, and aerospace combat environments. In the combat environment, being the employer of choice and diversity of the work force has no operational capability connection to human performance survivability while dishing out and absorbing tremendous punishment. Although significant occupational similarities exist to being a gunner in an army tank, gunner in the turret on a navy warship, or gunner onboard an AC-130 ground attack aircraft there are also significant in the combat environment differences. Consequently, there may be sufficient task performance similarities, but all possible relevant circumstances in which cause the level of human performance to differ must be considered to have a valid analytical comparison.

Military occupations don't share equally the frequency and duration risk of putting members of the occupation into a particular harsh and physically demanding location at a specific time to directly engage and fight the enemy. It is also often the circumstances occupation connected supervisory and managerial positions often fail to connect into leading and directing others in the combat or operational environments. These correlations are distinctive dissimilarities often overlooked when casual connection is made inferring exact sameness in being a physically demanding occupation.

The implicit compromise of difference not properly applied has form of not all relevant circumstances taken into account. The Air Force Times published on March 18, 2013 a featured article<sup>69</sup> advocating SERE as having the gender-neutral fitness model for combat fitness and how to apply such a model throughout DOD. Unfortunately, there was significant omission of US Coast Guard Helicopter Swimmer Program, US Navy naval aviation rescue swimmer program having all physical and training the same for both genders since the late 1980s. This omission combined with suggestion the SERE fitness model should be and can be the DOD gender neutral combat fitness model misleadingly infers the Pararescue specialty physical ability and stamina standards and training are not gender neutral. Another unacceptable misleading assertion in the article is the assertion the rigorous fitness standards special operations airmen adhere to grew out of joint training with sister services like the Army. The more accurate casual development history is the rigorous fitness standards emerged from what was needed to perform in the lowest combat intensity of dishing out and absorbing tremendous punishment. Fortunately, the mention of student attrition rates (SERE 54%, CCT 70% and PJ 80%) is attributed to mindset being the determining cause more so than the rigorous physical training and fitness standards.



## SUMMARY

Accompanying the declining physical fitness in each new generation of young adults has been a training philosophy trend of drifting adversely to accommodating the least able. A complementing trend of increasing and guaranteeing gender diversity in all military occupations has put considerable politicized interest to develop and implement generic all-encompassing gender-neutral combat fitness standards or combat athlete standards. This subsequently encourages functional managers and members of Air Force specialties new to the developing gender-neutral fitness standard to advertise politically correct diversity certainty of having developed the gender-neutral standard for all ground combat jobs.

The operational environment the PJ goes into has never been an athletic competition against another competitor but against conditions of the environment, situations in the environment, and living through successfully accomplishing the mission to be available to do the next mission and the next mission. The physical demands are great and being immersed in such environment performing requires motivation (a state of mind) to be there.

The Pararescue Indoctrination Course weathering and surviving forty-nine (1965-2014) years and still accumulating in existence years is certainly a test of time indicator of doing something properly that is useful. This usefulness results from directly connecting minimum necessary Physical Ability and Stamina human performance standards to performing core tasks and skill in the operational environment with consideration to what is the acceptable operational risk influences what the training and assessment of human performance minimums are.

The Pararescue Indoctrination Course's structured performance based training existing to ensure the person who has the right abilities and attitudes to adapt and to survive in doing rescue missions is put into training. This training increases commanders' confidence and willingness to commit employing pararescue capability from the aircraft to the ground surface or into the ocean surface to aid and assist others who are in a perilous environment.

In doing so, the Pararescue Indoctrination Course saves the Air Force a sizable amount in student attrition costs by filtering out poor performers and those having a change of job interests into other Air Force jobs more suited their capabilities at the earliest entered into training time by having a location collocated with the Basic Training Center.

In doing so, the Pararescue Indoctrination Course's student training production has put further into training students having a reasonable certainty of completing training having the resiliency to perform duties successfully in the operational environment once all required AFSC awarding training is completed.

The Pararescue Physical Ability and Stamina standards do not ensure or guarantee any person has suitable or adequate mission ready or combat ready fitness (not robust enough for this purpose). However, these standards are sufficient to give supervisory and management a tool to ensure the unit has adequate fitness programs to allow persons to obtain and sustain mission ready fitness; and more importantly to ensure the unit's Pararescue personnel are participating in fitness activities sufficient to obtain and sustain mission ready fitness. Pararescue PAST standards also provide the means to determine if persons are concealing injuries and other

medical conditions that are medical disqualifications that put the individual and others at higher risk in the doing of training activities and mission activities. The Pararescue PAST is the managerial or supervisory tool used to determine the person has returned to adequately sufficient high-level function after healing or recovering from a lengthy temporary disqualifying medical condition. In this aspect PAST integrates as a rehabilitation minimum acceptable return to duty fitness standard for persons recovering from injuries impairing ability to walk, run, jump and do other physically demanding activities. Passing PAST demonstrates person having sufficient mobility, agility and strength to minimize mishaps during participation in required high-risk training in a risk limiting controlled environment.

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<sup>1</sup> Mills, Mae Link and Hubert A. Coleman. Medical Support of the Army Air Forces in World War II. Department of the Air Force, Office of the Surgeon General: Washington DC, 1955. 754-755.  
<http://www.afhso.af.mil/shared/media/document/AFD-101203-018.pdf>

<sup>2</sup> Mills, Mae Link and Hubert A. Coleman. Medical Support of the Army Air Forces in World War II. Department of the Air Force, Office of the Surgeon General: Washington DC, 1955. 498-502, 704-708, 853-856.

<sup>3</sup> Mills, Mae Link and Hubert A. Coleman. Medical Support of the Army Air Forces in World War II. Department of the Air Force, Office of the Surgeon General: Washington DC, 1955. 756.

<sup>4</sup> Mills, Mae Link and Hubert A. Coleman. Medical Support of the Army Air Forces in World War II. Department of the Air Force, Office of the Surgeon General: Washington DC, 1955. 454, 495, 500, 673, 676, 847.

<sup>5</sup> Mills, Mae Link and Hubert A. Coleman. Medical Support of the Army Air Forces in World War II. Department of the Air Force, Office of the Surgeon General: Washington DC, 1955. 961

<sup>6</sup> Mills, Mae Link and Hubert A. Coleman. Medical Support of the Army Air Forces in World War II. Department of the Air Force, Office of the Surgeon General: Washington DC, 1955. 498-502, 704-708, 853-856.

<sup>7</sup> Mills, Mae Link and Hubert A. Coleman. Medical Support of the Army Air Forces in World War II. Department of the Air Force, Office of the Surgeon General: Washington DC, 1955. 498-502, 704-708.

<sup>8</sup> Ring, Michael J. Rangers: selected combat operations in World War II. Combat Studies Institute, U.S. Army Command and General Staff College, Fort Leavenworth, Kansas. June 1985. Online  
<http://www.cgsc.edu/carl/download/csipubs/king.pdf> accessed 6 September 2013.

<sup>9</sup> Chambers, John Whiteclay, II. OSS Training in the National Parks and Service Abroad in World War II. U.S. National Park Service Washington, D.C. 2008 v, 74, 271, 566, 567, 574. Online  
[http://www.nps.gov/history/history/online\\_books/oss/index.htm](http://www.nps.gov/history/history/online_books/oss/index.htm) also  
<http://www.ossreborn.com/files/OSS%20Training%20Areas%20in%20the%20National%20Parks%20Chambers.pdf>  
both accessed 6 September 2013

<sup>10</sup> Kent B. Pandolf, PhD and Robert E. Burr, MD. Medical Aspects of Harsh Environments, Volume 2. Textbooks of Military Medicine. Washington, DC: Borden Institute, Office of the Surgeon General, US Army Medical Department, 2002: chapter 38 Organizational, Psychological, and Training Aspects of Special Operations Forces. Online [https://ke.army.mil/bordeninstitute/published\\_volumes/harshEnv2/HE2ch38.pdf](https://ke.army.mil/bordeninstitute/published_volumes/harshEnv2/HE2ch38.pdf) accessed 31 March 2014.

<sup>11</sup> A Brief History of the 336<sup>th</sup> Training Group. Office of History 336<sup>th</sup> Training Group, Fairchild AFB: October 2012. Online <http://www.fairchild.af.mil/shared/media/document/AFD-130103-052.pdf> accessed 6 September 2013. The development of survival training is presented pages 11-30. Makes no mention of The School of Applied Tactics, Orlando, Florida and of the survival courses developed and conducted by the School of Applied tactics and subsequently the Air Rescue Service. The omission asserts Air Force did not operate and survival schools or courses prior to 1947.

<sup>12</sup> Brigadier General Don D. Flickinger (Up to date as of May 1956)  
<http://www.af.mil/information/bios/bio.asp?bioID=5430>

- 
- <sup>13</sup> Flickinger, D. D., and Hetherington, A. Man--the Essential Factor in Systems. Directorate of Human Factors, Headquarters, Air Research and Development Command, Baltimore, MD, December 1957.  
Mackowski, Maura Phillips. Testing The Limits: Aviation Medicine And The Origins Of Manned Space Flight. Texas A&M University Press: 2006
- <sup>14</sup> Pedlow, George W. and Donald E. Welzenbach. The Central Intelligence Agency and Overhead Reconnaissance: The U-2and OXCART Programs,1954-1974. History Staff Central Intelligence agency Washington, D.C., 1992. Approved for release 2013/06/25. 62 Online <http://www2.gwu.edu/~nsarchiv/NSAEBB/NSAEBB434/> (accessed 8/19/2013)  
HQ AIR RESCUE SERVICE. First annual Pararescue competition for the Don Flickinger Trophy. 3 December 1954.  
History of Discover. History Office Space and Missile Organization Air Force Systems Command: June 29, 1954. Online [http://www.nro.gov/foia/declass/WS117L\\_Records/292.PDF](http://www.nro.gov/foia/declass/WS117L_Records/292.PDF) accessed 6 September 2013—also Bioastronautics-Discover Board Report. 22 December 1959 3, 4, 11-15, 28, online [http://www.nro.gov/foia/declass/WS117L\\_Records/112.PDF](http://www.nro.gov/foia/declass/WS117L_Records/112.PDF) accessed 6 September 2013.
- <sup>15</sup> Fountain, Henry. Dr. Donald D. Flickinger, 89, A Pioneer in Space Medicine (Obituary). New York Times: March 7, 1997. Online <http://www.nytimes.com/1997/03/09/us/dr-donald-d-flickinger-89-a-pioneer-in-space-medicine.html> accessed September 6, 2013.
- <sup>16</sup> Cassidy, John F., MSgt, Retired Air Force. The 2 August 1943 crash of C-46 # 41-12420 and significance of the rescue of its crew and passengers. Unpublished 22 May 2013.
- <sup>17</sup> Air Command calls for Arctic Vets. Fairbanks News-Miner, Wednesday, June 23, 1948. 8  
Department of the Air Force-Air Rescue Service. HQ Air Rescue Service Historical Data 1 Jul – 31 December 1951. 91.
- <sup>18</sup> Department of the Air Force-Air Rescue Service. HQ Air Rescue Service Historical Data 1 Jul – 31 December 1951. 91.
- <sup>19</sup> Military Airlift Command, HQ Aerospace Rescue and Recovery Service. News Release Pararescue Fact Sheet AL 66-4839. 1966. Entry classification fitness test requirement: Physically be able to perform: 1600 yard swim using breast stroke or side stroke; one mile run in 8½ minutes, 6 chin-ups, 22 pushups, 20 sit-ups, and 80 deep knee bends in two minutes. All events performed with only a two minute rest between events. Selection of Pararescue trainees is done only in Basic Training.  
Hq 23<sup>rd</sup> Air Force. Pararescue History 1947-1988. 10. The formal origins of the Pararescue Indoctrination Course administering and managing student pipeline training requirements began in 1966 at Orlando AFB, Florida. In 1967 the obtaining of pipeline course student quotas and training pipeline administration and management moved from Orlando AFB to Lackland AFB.
- <sup>20</sup> National Research Council (U.S.) Committee on the Youth Population and Military Recruitment. Assessing fitness for military enlistment : physical, medical, and mental health standards. Sackett, Paul R., Mavor, Anne S., ed. The National Academies Press, 2006. 7, 79, 181.
- <sup>21</sup> National Research Council (U.S.) Committee on the Youth Population and Military Recruitment. Assessing fitness for military enlistment : physical, medical, and mental health standards. Sackett, Paul R., Mavor, Anne S., ed. The National Academies Press, 2006. 9, 195.
- <sup>22</sup> Knapp, Lawrence. Recruiting and Retention in the Active Component Military: Are There Problems? Congressional Research Service for Congress. February 25, 2002 Internet <http://congressionalresearch.com/RL31297/document.php?study=Recruiting+and+Retention+in+the+Active+Component+Military+Are+There+Problems> accessed May 2, 2013
- <sup>23</sup> National Research Council (U.S.) Committee on the Youth Population and Military Recruitment. Assessing fitness for military enlistment: physical, medical, and mental health standards. Sackett, Paul R., Mavor, Anne S., ed. The National Academies Press, 2006. 2.
- <sup>24</sup> National Research Council (U.S.) Committee on the Youth Population and Military Recruitment. Assessing fitness for military enlistment: physical, medical, and mental health standards. Sackett, Paul R., Mavor, Anne S., ed. The National Academies Press, 2006. 3.

- 
- <sup>25</sup> Forman, Mark R., Maj. Too Fat to Fight-Too Weak to Win, Soldiers fitness in the future? Army Command and General Staff College, School of Advanced Studies Monograph. Fort Leavenworth Kansas, First Term AY 96-97. 3.
- <sup>26</sup> Greene, Channing M. Jr., Maj. Canopies of Blue: The American Airborne Experience in the Pacific in the Second World War as a Case Study in Operational Art and Multi-role Flexibility. School of Advanced Military Studies, United States Army Command and General Staff College Monograph. Fort Leavenworth, Kansas, AY 2008. 22.
- <sup>27</sup> National Research Council (U.S.) Committee on the Youth Population and Military Recruitment. Assessing fitness for military enlistment: physical, medical, and mental health standards. Sackett, Paul R., Mavor, Anne S., ed. The National Academies Press, 2006. 96.
- <sup>28</sup> Mental Health, United States, 2010. U.S. Department of Health and Human Services. Substance Abuse and Mental Health Services Administration
- <sup>29</sup> Department of the Air Force-Air Rescue Service. Air Rescue Service celebrates tenth anniversary. HQ Air Rescue Service, May 24, 1956.
- <sup>30</sup> Department of the Air Force-Air Rescue Service. HQ Air Rescue Service Historical Data 1 Jul – 31 December 1955. 68-69.
- <sup>31</sup> Manacapilli, Thomas ... [et al.]. Reducing Attrition in Selected Air Force Training Pipelines. Sponsored by the United States Air Force under Contract FA7014-06-C-0001. RAND Corporation, 2012.
- <sup>32</sup> Manacapilli, Thomas ... [et al.]. Reducing Attrition in Selected Air Force Training Pipelines. Sponsored by the United States Air Force under Contract FA7014-06-C-0001. RAND Corporation, 2012. 114.
- <sup>33</sup> Buttolph, Loren D., Lt Col. The case for parachute landing of materiel and personnel as opposed to glider and air landing. Army Command and General Staff College, School of Advanced Studies Monograph. Fort Leavenworth Kansas, 31 May 1949. 9 and attachment page 4
- <sup>34</sup> Department of the Air Force-Air Rescue Service. ARSM 50-1 Air Rescue Service Training Manual. April 1951. Paragraph 34.7.
- <sup>35</sup> Department of the Air Force-Air Rescue Service. HQ Air Rescue Service Historical Data 1 January – 30 June 1952. 4
- <sup>36</sup> Buckley, Clifford J. Reply: A Fitness test Question. Email to jcassidy@alaska.net from Clifford.Buckley@va.gov in response to question from John Cassidy. Internet, Thu 3/21/2013 5:23 AM. Dr. Clifford Buckley, MD, FACS is board certified in Surgery and Vascular Surgery. He served as 55 ARS (PJ support) from 1964-1965 and as HQ Air Rescue Service Surgeon from Fall 1965-Fall 1969. In 1966, the Society of United States Air Force Flight Surgeons presented him the prestigious “Malcolm C. Grow Award” in recognition for his outstanding contributions as an Air Force flight surgeon to the flying organization.
- <sup>37</sup> Training Advisory Alert (TAA 92-6) AFSC 115X0 Pararescue Duty Retraining Procedures. HQ AFMPC Randolph AFB TX, DPMRAS4. R231530Z MAR 92.
- <sup>38</sup> Department of the Air Force. Air Force Enlisted Classification Directory (AFECD). HQ AFPC/DPSIDC, 31 October 2012. 1T2X1 Pararescue
- <sup>39</sup> Department of the Air Force. AFMAN 36-2108, Attachment 9, (Effective 31 October 1993 for both Pararescue and Combat Control), 31 October 1994. 187-188 and 216-217
- <sup>40</sup> FY94 National Defense Authorization Act, HR H.R.2401, 103 Cong. §543 Gender-Neutral Occupational Performance Standards (1993)
- <sup>41</sup> Carney, John T. Jr., Colonel and Benjamin F. Schemmer. No Room for Error, The covert operations of America's Special Tactics Units from Iran to Afghanistan. Ballantine Books, New York. Mass Market Edition: October 2003. 197-199
- <sup>42</sup> HQ USAF Washington DC. Removal of Combat aviation exclusion for all commanders from Gen McPeak. 282200Z Apr 93.

- 
- <sup>43</sup> Department of the Air Force. AFMAN 36-2108, Attachment 9, (Effective 31 October 1993 for both Pararescue and Combat Control), 31 October 1994.
- <sup>44</sup> Department of the Air Force. AFI 16-1301 Survival, Resistance, Escape, and Evasion (SERE) Program, 4 September 2006. 30. “Those who fail the retest should not be considered for worldwide deployment, field operations under adverse conditions, or airborne duty. A review board will be convened after the second failure.
- <sup>45</sup> Department of the Air Force. AFMAN 36-2108 Airman Classification, 31 October 1994. 213-214. Attachment 9. Survival Training-- Specialty Summary. Manages, and conducts formal courses of instruction and survival training activities. Develops and instructs formal course curriculum and aircrew continuation training programs for aircrew members and other designated personnel. These courses and programs include impact of conditions effecting survival, evasion, resistance to exploitation, escape, recovery, use of life support equipment, and emergency parachute descent. Related DoD Occupational Subgroup: 012. PULHES 2 2 2 2 3 1.
- <sup>46</sup> On 14 December 1953 a message from Headquarters MATS advised the Air Rescue Service that the MATS Advanced Survival school at McCall, Idaho was to be deactivated on 24 December. Further inquiry determined only a minimum of survival training will be taught at McChord AFB. [Department of the Air Force-Air Rescue Service. HQ Air Rescue Service Historical Data 1 January – 30 June 1953. ]
- <sup>47</sup> Office of History 336th Training Group. A Brief History of the 366<sup>th</sup> Training Group. Fairchild AFB, Washington, October 2012. 14, 21 Also: A female that had entered training in Jan 77 failed to complete training was reclassified into Dental Hygiene AFSC.
- <sup>48</sup> Department of the Air Force. AFMAN 36-2108 Airman Classification, 31 October 1994. 190. Attachment 6. Tactical Air Command and Control-- Specialty Summary. Performs and manages tactical air control party (TACP) operations. Provides Air Force assistance and expertise in planning and controlling combat air resources. Operates and supervises communications nets to support army ground maneuver units. Related DoD Occupational Subgroup: 250.
- <sup>49</sup> Kelsey, Adawn, A1C. First Airmen graduate extended Air Force EOD screening course. 82nd Training Wing Public Affairs, 6/29/2011.
- <sup>50</sup> Hawkins, Dan. EOD tech school puts 'battlefield' into PT. 82nd Training Wing Public Affairs, 8/14/2012.
- <sup>51</sup> Ricks, Markeshia. “EOD unit workout a new PT model?” Air Force Times, Oct 25, 2012.
- <sup>52</sup> Csurilla, Sara, SSgt. EOD trains for perfection. U.S. Air Forces Central Public Affairs, Date: 05.08.2012, Posted: 05.09.2012 13:12, News ID: 88158. <http://www.dvidshub.net/news/88158/eod-trains-perfection>
- <sup>53</sup> Department of the Air Force. AFI 11-410 Personnel Parachute operations, 4 August 2008. 29-30.
- <sup>54</sup> Department of the Air Force-Air Rescue Service. ARS Commander Conference 30 July to 3 August 1956. 93
- <sup>55</sup> The 43E Rigger MOS opened to females in 1972. However, female riggers (MOS 43E) were not jump qualified and did not attend and complete the Basic Airborne Course until the last months of 1973. On 14 December 1973, Privates Joyce Kutsch and Rita Johnson became the first women to graduate from the Basic Airborne Course. Following graduation from a modified airborne course the two women successfully completed the U.S. Army Quartermaster School Parachute Rigger Course and were assigned to Aerial Delivery Companies at Fort Bragg, NC. These two women were also the first two women to graduate from Parachute Maintenance and Air Delivery (rigger) Course. The fitness test standards for BAC were not gender neutral as FM 35-20 Physical Fitness Training for women clearly discloses specific airborne test standards are gender scaled and the tested events modified (incline chin-up, modified sit-ups, modified pushups) for the female gender.
- <sup>56</sup> Department of the Army. FM 35-20 Physical Fitness Training for Women. February 1975. 174- para 204 C. (4) Airborne Physical Fitness Qualification Test for Women , 175-176 figure 87-Army Physical Fitness Score Card for Men and Women, 194-para 213 Airborne Trainee Physical Fitness Qualification Test For women.
- <sup>57</sup> <http://www.benning.army.mil/infantry/rtb/1-507th/airborne/> (accessed 1 December 2013)—“**ALL students must meet the weight requirement of 110 lbs (in ACUs) to attend the Basic Airborne Course.** Students must MAINTAIN this weight throughout training and jump week. If a student falls under the minimum weight limit they will be released from the course. The 110 lbs standard is the minimum acceptable weight to meet the minimum 160lbs

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weight for jumping the T-11ATPS. (110+T-11 weight = 162.2).”

<http://www.benning.army.mil/infantry/rtb/1-507th/content/pdf/1-507th%20Training%20Calendar.pdf> (accessed 1 December 2013) — “Basic Airborne School Graduation Requirements, “Pass an APFT in the 17-21 age group standards (Male : 42 PU/53 SU/15:54 2 MI)(Female: 19 PU/53 SU/18:54 2 MI), **Complete all physical fitness distance runs.**”

<https://www.atrrs.army.mil/atrrscc/prerequisites.aspx?fy=2007&sch=071&crs=2E-SI5P/SQI7/011-SQIP&phase=&cls=013&clsflag=&startDate=2007-02-05&endDate=2007-02-23> (accessed 1 December 2013) — “Students will also be tested on the flexed-arm hang. The student must grasp a horizontal bar with thumbs around the bar and palms facing toward the body. The student must raise his/her body (with no assistance) until the chin is over the bar and the arms are flexed at the elbow (executing one chin-up). Feet free of the ground. The student holds the position as long as possible. Performance of the test is terminated if the chin touches the bar, tilts backward, or moves below the bar. Legs and trunk should remain motionless throughout the entire test. Knees must not be raised and kicking is not permitted. The score is the number of seconds (rounded up to the nearest second) the student holds the hanging position, in one trial only. **The student must maintain the flexed-arm position for at least 10 seconds in order to be admitted into the course.**” ... “**Applicants must be able to complete a 5-mile run within 45 minutes 30 days prior to the class start date.** The sending unit commander will sign a memorandum attesting to the soldiers successful completion of the 5-mile run and the memorandum will accompany the student to the course.”

<sup>58</sup> Department of the Air Force. AFPAM 90-803 Risk Management (RM) Guidelines and Tools. 11 February 2013. Para 32.2.4.

<sup>59</sup> Pararescue Association. Pararescue 50 Years 1943-1993 a commemorative history. Taylor Publishing Company, Dallas Texas. 1996. 92-93.

<sup>60</sup> U.S. Department of Homeland Security-United States Coast Guard. Final Action on the administrative investigation into the diving mishap and the resulting deaths of USCGC Healy’s crewmembers that occurred on 17 August 2006. January 10, 2007. Internet accessed May 10, 2013 [http://www.uscg.mil/foia/healy/healy\\_fam.pdf](http://www.uscg.mil/foia/healy/healy_fam.pdf)  
U.S. Department of Homeland Security-United States Coast Guard. Statement of Admiral Thad W. Allen, Commandant of the U.S. Coast Guard, regarding the administrative investigation into the 17 August 2006 Coast Guard Cutter Healy Mishap. January 12, 2007. Internet accessed May 10, 2013 [http://www.uscg.mil/foia/healy/comdt\\_statement\\_12\\_jan.pdf](http://www.uscg.mil/foia/healy/comdt_statement_12_jan.pdf)

<sup>61</sup> Media Release, Explosive Ordnance Disposal Group Two. “Diving Accident Claims Two Navy Divers.” Release No. 13-003, February 27, 2013. Internet accessed January 20, 2014

<http://www.atec.army.mil/news/130227%20Diving%20Accident%20Claims%20Two%20Navy%20Divers%2013-003.pdf>

DIVIDS News. “Diving accident claims two navy divers”. <http://www.dvidshub.net/news/103665/diving-accident-claims-two-navy-divers>

Faram, Mark D., Staff writer. “Report finds problems with gear used by sailors in fatal dive”. Navy Times. January 16, 2014. Internet accessed January 20, 2014

<http://www.navytimes.com/article/20140116/NEWS/301160028/Report-finds-problems-gear-used-by-sailors-fatal-dive>

Ruane, Michael E. “Court-martial set to start for Navy supervisor in connection to 2 divers’ deaths”. Washington Post. January 12, 2014. Internet accessed January 20, 2014 [http://www.washingtonpost.com/local/court-martial-set-to-start-for-navy-supervisor-in-connection-to-2-divers-deaths/2014/01/12/79134872-5dee-11e3-95c2-13623eb2b0e1\\_story.html](http://www.washingtonpost.com/local/court-martial-set-to-start-for-navy-supervisor-in-connection-to-2-divers-deaths/2014/01/12/79134872-5dee-11e3-95c2-13623eb2b0e1_story.html)

Cahn, Dianna. “Master diver found negligent in incident that killed two” The Virginian-Pilot. January 18, 2014. Internet accessed January 20, 2014 <http://hamptonroads.com/2014/01/master-diver-found-negligent-incident-killed-two>

<sup>62</sup> Human Factors is also known as ergonomics. Physical ergonomics is concerned with human anatomical, anthropometric, physiological and biomechanical characteristics as they relate to physical activity. The relevant topics include working postures, materials handling, repetitive movements, work-related musculoskeletal disorders, workplace layout, safety and health. Cognitive ergonomics is concerned with mental processes, such as perception, memory, reasoning, and motor response, as they affect interactions among humans and other elements of a system. The relevant topics include mental workload, decision-making, skilled performance, human-computer interaction, human reliability, work stress and training as these may relate to human-system design. Organizational

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ergonomics is concerned with the optimization of sociotechnical systems, including their organizational structures, policies, and processes. The relevant topics include communication, crew resource management, work design, design of working times, teamwork, participatory design, community ergonomics, cooperative work, new work paradigms, organizational culture, virtual organizations, telework, and quality management. The International Ergonomics Association approved these definitions of ergonomics in 2000.

<sup>63</sup> Human Factors is also known as ergonomics. Physical ergonomics is concerned with human anatomical, anthropometric, physiological and biomechanical characteristics as they relate to physical activity. The relevant topics include working postures, materials handling, repetitive movements, work-related musculoskeletal disorders, workplace layout, safety and health. Cognitive ergonomics is concerned with mental processes, such as perception, memory, reasoning, and motor response, as they affect interactions among humans and other elements of a system. The relevant topics include mental workload, decision-making, skilled performance, human-computer interaction, human reliability, work stress and training as these may relate to human-system design. Organizational ergonomics is concerned with the optimization of sociotechnical systems, including their organizational structures, policies, and processes. The relevant topics include communication, crew resource management, work design, design of working times, teamwork, participatory design, community ergonomics, cooperative work, new work paradigms, organizational culture, virtual organizations, telework, and quality management. The International Ergonomics Association approved these definitions of ergonomics in 2000.

<sup>64</sup> Department of the Air Force. AFI 90- 802 Risk Management. 11 February 2013. 12, para 6.1

<sup>65</sup> Department of the Air Force. AFI 90- 802 Risk Management. 11 February 2013. 21-22, para 9.4.1.

<sup>66</sup> Doran, Anthony P., Gary Hoyt, Charles A. Morgan, III. Survival, Evasion, Resistance, and Escape (SERE) Training-Preparing Military Members for the Demands of Captivity. Military Psychology, Second Edition: Clinical and Operational Applications, 2012)

<sup>67</sup> Headquarters Department of the Army. AR 600–8–19 Enlisted Promotions and Reductions, 49  
Department of the Air Force. AFI 11-402 Aviation and Parachutist Service, Aeronautical Ratings and Aviation Badges. 13 December 2010, certified current 5 February 2013. 43, 77, 107

<sup>68</sup> Ricks, Markeshia. “Paving the way for women in combat, SERE is the gender-neutral standard for fitness.” Air Force Times, 18 March 2013: 24.

<sup>69</sup> Ricks, Markeshia. “Paving the way for women in combat, SERE is the gender-neutral standard for fitness.” Air Force Times, 18 March 2013: 24.