

INFORMATION PAPER

ATCG-MTA
31 AUG 20

SUBJECT: Defense Department Advisory Committee on Women in the Services (DACOWITS) June Quarterly Business Meeting Request for Information (RFI)

Purpose. To provide DACOWITS written responses to the following questions related to the ACFT:

ARMY COMBAT FITNESS TEST (ACFT) (E&I)	
In October 2018, master fitness trainers began field-testing the Army Combat Fitness Test (ACFT). In early 2019, select Army units took two 'not-for-record' ACFTs. By October 2020, the new age- and gender-neutral ACFT is slated to replace the nearly 40-year-old Army Physical Fitness Test (APFT) and become the new official test of record. The Committee is interested in learning more about how this test will impact servicewomen's careers in the Army.	
7	The Committee requests a written response from the Army on the results of the ACFT pilot and testing results to date: <ol style="list-style-type: none">Overall pass/fail rates by gender and age.Individual element pass/fail rates by gender and age.
8	The Committee request a written response from the Army detailing the science used to establish the ACFT with gender and age neutral requirements, to include: <ol style="list-style-type: none">What science resources support gender and age neutral requirements?Do any of these science resources identify risks relative to gender and age for any of the six ACFT elements?
9	<p>The National Defense Authorization Act (NDAA) made provisions for gender neutral occupational testing. In addition, DoDI 1308.3, <i>DoD Physical Fitness and Body Fat Programs Procedures</i>, Para. 6.1.3.1, states: "PFTs assess Service-wide baseline generalized fitness levels and are not intended to represent mission or occupationally specific fitness demands." The Committee is concerned that the Army's new ACFT may fall outside the intent of the NDAA and the scope of DoDI policy.</p> <p>In December 2019, the Army briefed the Committee on the status of their ACFT pilot and program rollout. The Committee requests a follow-up written response from the Army on how the ACFT meets the intent of the NDAA provisions and DoDI 1308.3.</p>

Background.

- In 2013, the rescission of the 1994 Direct Ground Combat Definition and Assignment Rule paved the way for more women to serve in direct combat roles and in Military Occupational Specialties (MOS) previously open only to men.
- In 2014, the US Army began assigning women to previously closed occupations using clear performance standards, and developing a pathway for women to serve in direct combat MOSs.
- Between Fiscal Year (FY) 2012-18, US Army Training and Doctrine Command (TRADOC) conducted the Soldier 2020: Physical Demands Study (PDS), led by US Army Research Institute of Environmental Medicine (USARIEM), in collaboration with US Army Public Health Center (USAPHC) and US Army Center for Initial Military Training (USACIMT). The PDS purpose was to inform Army Gender Integration planning and execution.

- (1) PDS data enabled the Army to develop the Occupational Physical Assessment Test (OPAT), a 4-event physical fitness test consisting of the deadlift, seated power throw, standing long jump, and interval aerobic run. The OPAT allows Future Soldiers to better align their occupation selection with their physical abilities.
 - (2) OPAT standards are gender and age neutral, with performance bands tiered to occupational requirements of the MOS.
 - (3) Since January 2017, every Soldier accessing into the US Army completed the OPAT to be assigned a MOS.
- d. Between FY13-18, TRADOC conducted the Baseline Soldier Physical Readiness Requirement Study (BSPRRS), led by USACIMT, USARIEM, and USAPHC. BSPRRS compared Soldiers' performance on simulated Warrior Tasks and Battle Drills (WTBD) and Common Soldier Tasks (CST) to performance on 23 different industry-validated, field-expedient fitness test events. The events incorporated into the ACFT are the most predictive of physical success in WTBD. See Appendix A for BSPRRS Executive Summary.
- (1) The ACFT was designed as the Army's baseline physical fitness test (as specified by DoDI 1308.3) and specifically correlates to high demand common Soldier tasks. Similar to the OPAT, the ACFT may also serve as a measure of physical capacity required by certain MOSs as specified in NDAA 1994, 2014 and 2015. Army senior leaders have postponed discussions on an MOS testing until after the Army has fully transitioned to the ACFT.
 - (2) The ACFT 2.0 is a 6-event physical fitness test consisting of the 3-repetition maximum deadlift (MDL), standing power throw (SPT), hand release push-up (HRP), sprint-drag-carry (SDC), leg tuck (LTK), and 2-mile run (2MR). In addition, the plank was added as a temporary measure for FY21 to assist Soldiers in the transition from the APFT to the ACFT.
 - (3) ACFT standards for FY20 and FY21 are age and gender neutral. Future scoring standards will be determined after the Army has fully transitioned to the ACFT and the University of Iowa has completed their standards validation study.
- e. In FY18, the Army conducted an ACFT Field Test Administration Phase to finalize the ACFT testing protocols and grader training Program of Instruction (POI).
- f. In FY19, the Army conducted an ACFT Field Test Phase to validate ACFT administrative procedures and determine the level of physical readiness of the force.
- g. ACFT Initial Operating Capability (IOC) Phase began in FY20, with the initial transition from the Army Physical Fitness Test (APFT) to the ACFT. The four objectives of IOC were: (1) purchase/ship ACFT equipment to all Army units, (2) train and validate ACFT graders, (3) administer a practice ACFT to every Soldier, and (4) determine the extent of the Army's physical readiness challenges. The IOC Phase provides Soldiers and units an opportunity to practice the ACFT and develop more comprehensive physical training programs with greater focus on strength, power, agility, coordination, balance, speed, and endurance. Changing the way Soldiers train, by refocusing training

on all components of fitness, will increase readiness for multi-domain operations.

- h. FY21 and Beyond – The Army will transition to the ACFT as the Army’s test of record on 1 OCT 2020. The Army’s Holistic Health and Fitness (H2F) System, which also began implementation in FY19, and includes the ACFT, represents a generational shift in the way the Army develops, trains, and cares for Soldiers. H2F will help improve overall physical and non-physical performance (sleep, nutrition, spiritual, and mental readiness), reduce musculoskeletal injuries (MSKI), and build the Army of tomorrow, today. Changing the Army’s culture of fitness will not happen quickly, but we must start now to build the Army of the future. Healthier and more physically fit Soldiers exhibit a myriad of positive attributes such as increased productivity, greater immunity to illness and injury, greater physical capacity, lower attrition rates, and greater sense of self-worth and mental toughness. The transition to the ACFT and H2F implementation will take years to mature and Army Senior Leaders are prepared to give Soldiers the time to revise and implement PRT programs to bring about meaningful changes in physical readiness. Our obligation to our Soldiers is to provide them with an immersive, integrative and comprehensive training system to ensure success. The Army succeeds when our Soldiers succeed.

Question 7. The Committee requests a written response from the Army on the results of the ACFT pilot and testing results to date:

- a. Overall pass/fail rates by gender and age.
- b. Individual element pass/fail rates by gender and age.

Relative to the force structure and size of the Army, we have relatively few ACFT test results to date. There was always an understanding it would take the Army several years to fully transition to the ACFT after the test became the test of record.

Included are available data showing pass/fail rates by month by gender, individual test event pass/fail rates by FY/QTR by gender, and individual test event pass/fail rates by gender for Soldiers 35 years of age and older. These data represent all Army components (Active, Guard, and Reserve) (see Appendix B for additional ACFT data):

ACFT Field Test Pass Rate over time:

	FY19	19-Oct	19-Nov	19-Dec	20-Jan	20-Feb	20-Apr	20-May	20-Jun
Women	21%	37%	29%	33%	34%	40%	40%	43%	37%
Men	81%	91%	89%	91%	90%	90%	88%	91%	87%
Total	72%	84%	81%	83%	81%	84%	75%	81%	78%

ACFT Pass Rates (60-point) by Test Event:

	MDL	SPT	HRP	SDC	LTK	2MR
Women- FY19	92%	76%	94%	82%	17%	84%
Women- FY20-Q1	94%	84%	96%	88%	36%	90%
Women- FY20-Q2	99%	85%	97%	94%	46%	91%
Women- FY20-Q3	93%	81%	94%	91%	48%	82%
Men- FY19	95%	95%	96%	98%	90%	96%
Men- FY20-Q1	98%	98%	99%	99%	92%	97%
Men- FY20-Q2	100%	100%	100%	100%	93%	98%
Men- FY20-Q3	98%	99%	99%	100%	93%	95%

FY20 ACFT event pass rate (60-point) for Men/Women 35 and older:

	MDL	SPT	HRP	SPC	LTK	2MR
Women	98%	89%	96%	92%	38%	87%
Men	100%	100%	100%	100%	93%	97%

- a. Soldiers from all components (Active, Guard, and Reserve) continue to show improvement passing the ACFT test events. Although the number of reported scores is small and COVID mitigation has placed additional challenges on training and testing, these scores reflect the early stages of change in physical readiness training programs and the Army's fitness culture.
- b. Initial Entry Training (IET) Trainees have generally progressed faster than the remainder of the Army. In the most recent June – July 2020 sample 92% of men passed the ACFT and 47% of women passed. In FY20, Q1 and early Q2 (pre-COVID) individual IET units reported ACFT pass rates as high as ~95% for men 70% for women at the end of Basic Combat Training (BCT). COVID-19 has been disruptive to the process; however, trainees who struggle with the ACFT can default to the APFT through FY20-Q4. Trainees are also allowed to graduate BCT with a one-event waiver. Soldiers who do not pass the ACFT in BCT receive additional training and testing during their Advanced Individual Training.
- c. We have very little BOLC-A data (Officer candidates) but in a recent partial sample test at West Point 98% of males and 62% of females pass the ACFT.
- d. The sample of men over 35 years of age is too low to make any generalizable conclusions; > 35 men passed the ACFT at approximately 11% higher rate than men under 35. The sample of women over 35 years of age is too low to make any generalized conclusions; women > 35 passed the ACFT at approximately 10% lower rate than women under 35. From comparative months, men in the Pre-Command Course (FT Leavenworth) passed the ACFT at ~84% - about 5% lower rate than men < 35; women passed at ~37% - about the same rate as women < 35.

Question 8: The Committee request a written response from the Army detailing the science used to establish the ACFT with gender and age neutral requirements, to include:

- a. What science resources support gender and age neutral requirements?**
- b. Do any of these science resources identify risks relative to gender and age for any of the six ACFT elements?**

DoDI 1308.3, 6.1.3.2 states that “All Service members, regardless of age, will be formally evaluated and tested for record at least annually unless under medical waiver. PFT standards may be adjusted for age and gender.” The criterion measures used to validate the ACFT were Warrior Tasks and Battle Drills and Common Soldier Tasks. These tasks are common / required of all Soldiers regardless of age or gender. Therefore, the BSPRRS study team developed and published interim scoring standards for FY20 and FY21. Appendix C presents various methodologies used to establish the initial baseline (60-points) standards. The University of Iowa Technology Institute in the Department of Biomedical Engineering is currently conducting an independent validation of the ACFT baseline performance standards.

None of our data, reviews or training have identified any unusual risk due to age or gender when conducting the ACFT. Regardless of age or gender, there are no physiological reasons a Soldier cannot successfully train for and pass the ACFT. During the Field Test phase, thousands of Soldiers took a diagnostic ACFT with essentially no reported injuries. No commanders of tested units reported any concerns or identified risks with age/gender testing. The ACFT test events represent the physical requirements of high-demand common Soldier task – tasks that every Soldier must execute. These test events impose no greater relative risk to all Soldiers than executing common Soldier tasks, like extracting and evacuating a casualty. With the support of the Holistic Health and Fitness, system all Soldiers will have the right professionals, facilities and equipment to safely and effectively train for common tasks.

Question 9. The National Defense Authorization Act (NDAA) made provisions for gender neutral occupational testing. In addition, DoDI 1308.3, *DoD Physical Fitness and Body Fat Programs Procedures*, Para. 6.1.3.1, states: “PFTs assess Service-wide baseline generalized fitness levels and are not intended to represent mission or occupationally specific fitness demands.” The Committee is concerned that the Army’s new ACFT may fall outside the intent of the NDAA and the scope of DoDI policy. In December 2019, the Army briefed the Committee on the status of their ACFT pilot and program rollout. The Committee requests a follow-up written response from the Army on how the ACFT meets the intent of the NDAA provisions and DoDI 1308.3.

DoDI 1308.3, *DoDI Physical Fitness and Body Fat Programs Procedures*, (5 November 2002), Para. 6.1.3.1 states “Military Services shall develop and use physical fitness tests (PFTs) that evaluate aerobic capacity (e.g., timed run,

submaximal cycling) and muscular strength and muscular endurance (e.g., push-ups, pull-ups, sit-ups, machine tests). PFTs assess Service-wide baseline generalized fitness levels and are not intended to represent mission or occupationally specific fitness demands.”

The Army is aware of DACOWITS' concern regarding the implementation of the ACFT and NDAAs and DODI 1308.3. The Army has determined that the ACFT will serve as the Army's physical fitness test (PFT) as required by DODI 1308.3. The Army continues to collect data to inform decisions about the potential applicability of the ACFT as an MOS PT test under the 1994, 2014, and 2015 NDAAs. Once the Army has fully transitioned to the ACFT, senior leaders will address the MOS testing requirements specified in the NDAAs. The Army is committed to implementing the ACFT in a way that complies with the DODI and all Congressional requirements of the three NDAAs.

Soldiers face an evolving, dynamic, competitive, and lethal operational environment in which our adversaries will employ a mix of traditional, unconventional, and hybrid strategies. The Army's physical readiness program and physical fitness test must evolve to keep pace with the demands of modern warfare. The ACFT was developed through concurrent criterion validation with high demand common Soldier tasks. These tasks are required of all Soldiers. The ACFT is a highly accurate predictor of a Soldier's ability to execute these common Soldier tasks in multi-domain operations. The 60-point standard for each test event ensures every Soldier possesses the baseline physical fitness required to execute common Soldier tasks, often under the most adverse circumstances. The ACFT will strengthen the Army's culture of fitness, improve combat lethality, reduce injuries and increase the Army's readiness for war.

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Appendix A:

EXECUTIVE SUMMARY – Baseline Soldier Physical Readiness Requirements Study

The purpose of the Baseline Soldier Physical Readiness Study was to determine the physical requirements for Soldiers in a combat environment. The study used physically demanding, commonly occurring and critical Warrior Tasks and Battle Drills (WTBD) and Common Soldier Tasks (CST) as a proxy for combat tasks. There were three objectives: (1) determine the baseline physical requirements of WTBD/CST; (2) determine combat task variability explained by the Army Physical Fitness Test (APFT); and (3) determine if other common physical fitness test events were more predictive of combat task performance.

The Baseline Soldier Physical Readiness Requirements Study has three phases. In Phase I researchers conducted a systematic review and completed Soldier interviews and surveys. They also deconstructed Army Warrior Tasks and Battle Drills and Common Soldier Tasks to identify tasks that were physically demanding, commonly occurring and critical. In the final part of Phase I, male (243) and female (47) Soldiers (Fort Carson, CO) participated in the development of the WTBD simulation test (WTBD-ST). In Phase II, male (278) and female (46) Soldiers (Fort Riley, KS) performed the WTBD-ST, the Army Physical Fitness Test (APFT) and 23 common physical fitness test events to determine the baseline physical constructs of high demand WTBD performance and a battery of common exercises to predict WTBD-ST performance. This phase yielded eight events that most accurately predicted performance on the WTBD-ST. In Phase III, male (136) and female (16) Soldiers (Fort Benning, GA) performed the eight physical fitness test events, identified in Phase II, sequentially with no programmed rest and the WTBD-ST test. WTBD-ST performance was regressed against the 23 physical fitness test events using multiple linear regression.

The data from Phase II identified five basic constructs of high demand WTBD performance: (1) move quickly over, under, around, through obstacles; (2) lift, carry, drag heavy loads; (3) generate and apply force; (4) execute submaximal work for long periods; (5) move for long distances over uneven terrain under heavy loads. In the Phase II data analysis (FT Riley), the 3-event APFT was found to be a low predictor of WTBD-ST performance $R^2 = 0.432$ ($p = 0.000$). In the initial step-wise regression model where average WTBD-ST performance, with fighting load and following pre-fatigue, was regressed against the 23 predictor variables, researchers found a high multiple regression coefficient for eight variables ($R^2 = 0.737^1$; $p = 0.000$): sled drag, power throw, 2-mile run, deadlift, sled push, push-up, kettlebell squat, and power throw. While predictive validity was crucial to the final regression model, it was equally important to the Army to produce a model that assessed all components of fitness to transform physical readiness training and reduce musculoskeletal injuries. After considering these qualitative factors, a modified eight-event model was developed and analyzed. When modeling the sled drag, 2-mile run, deadlift, sled push, push-ups, power throw, leg tuck, and 300yd shuttle run, the analysis generated an $R^2 = 0.733$.

¹ The industry standard for human performance prediction is generally considered to be $R^2 = .70$.

In the Phase III data analysis (Fort Benning, GA), eight, modified fitness test events had no programmed rest. The WTBD-ST was also administered a different day. Four primary predictor variables were identified ($R^2 = 0.832$; $p = 0.001$): sled drag, power throw, 2-mile run, and deadlift, while four secondary measures accounted for additional variability: leg tuck, sled push, 300yd shuttle run and push-ups ($R^2 = 0.835$, $p = 0.000$).

Appendix B.

Additional ACFT Field Test – IOC Data.

Fort Jackson FY20-Q2 data:

		Total Pass	Best Battalion
Diagnostic	Men	65%	63%
	Women	8%	6%
Record	Men	91%	95%
	Women	35%	47%

Fort Sill FY20-Q2 best Basic Training Battalion pass rates:

Test 1	Men	75%
	Women	17%
Test 2	Men	91%
	Women	37%
Record	Men	97%
	Women	81%

Female Soldier Case Study - KSARNG, age=39, weight=119lbs, height=4'11"

	AUG 2019		APR 2020	
MDL (lbs)	180	Pass	200	Pass
SPT (m)	4.4	Fail	6.6	Pass
HRP (rep)	23	Pass	27	Pass
SDC (time)	3:45	Fail	2:34	Pass
LTK (rep)	0	Fail	17	Pass
2MR (time)	19:50	Pass	18:07	Pass
	FAIL		PASS	

Appendix C.

Baseline (60-point) ACFT Performance Standards.

3-Repetition Maximum Deadlift (MDL)

- Empirical Data: the bases for the Gold standard comes from empirical research from USARIEM in the PDS and aligns with the OPAT deadlift standard. To determine the 3RM (repetitions maximum) deadlift load, the standard was linked to the WTBD/CST “casualty extraction and evacuation” of a representative weight Soldier from a Bradley Fighting Vehicle (BFV).

- (1) Soldier weight – 185lbs + 90lbs (combat load) = 275lbs / 2 (2-person lift) = 137.5lbs
- (2) In order to lift 137.5lbs, a Soldier must be able to 1RM deadlift 170lbs (computed from the USARIEM regression formula developed in the PDS Study for BFV casualty extraction); 170lbs requires adjustment for the 3RM MDL.
- (3) Regression formula, CASEVAC weight = $-42.741 + 1RM * 1.061$
- (4) 1RM Deadlift formula = $CASEVAC\ weight + 42.741 / 1.061$

- a. = $137.5 + 42.741 / 1.061$
- b. = $180.24 / 1.061 = 170\text{lbs}$
- (5) Conversion of 1RM to 3RM = $1\text{RM} / 1.13$
- (6) MDL Gold Standard = $170\text{lbs} / 1.13 = 150\text{lbs}$
- (7) IOC 3RM MDL 60-point standard = rounded down to 140lbs

➤ Applied Data:

- (1) The deadlift minimum required of an untrained recruit to enter the US Army = 120lbs; 140lbs Gold standard represents a ~15% increase in lower body strength for the fully trained Soldier.

Standing Power Throw (SPT)

- Empirical Data: We conducted two analyses: regression analysis from Standing Long Jump and Standing Power Throw (MEDBALL2) data generated in the Fort Riley portion of the BSPRRS and a power generation comparison to the Seated Power Throw (OPAT) Gold standard.

- Computation of Standing Long Jump (SLJ) Gold standard from the Fort Riley BSPRRS data.

- (1) Results from the regression analysis: Y= Standing Power Throw, X= Standing Long Jump

Model	Unstandardized Coefficient		Standardized Coefficient Beta	t	Sig.
	B	Std. Error			
1 (Constant)	-14.740	2.466		-5.976	0.000
standing long jump inches	0.634	0.031	0.727	20.289	0.000

a. Dependent Variable: MEDBALL2

- (2) The Gold standard of the SLJ (OPAT) = 120 cm, 1.20 m, 47.244"
- (3) Regressing the SPT against the SLJ; $\text{SPT (feet)} = -14.740 + (0.634 * 47.244) = 15.196 \text{ ft} = 4.6317 \text{ m}$
- (4) We originally set the minimum SPT standard at 4.6 m for the Field Test, but lowered to 4.5 m for the IOC standard due to challenges with some Soldiers meeting that distance. 4.5 m is lower than the Gold requirement for accessions into the Army on the SLJ.

- Results below are from the power generation comparison (release velocity) for Seated Power Throw (OPAT) -- ball weight = 4.4 lbs, distance = 3.5 m, point of release = 1 m and Standing Power Throw (ACFT) -- ball weight = 10 lbs, distance = 4.5 m, point of release = 1.9 m.

- (1) Release velocity for the Seated Power Throw (OPAT) = 5.2 m/sec
- (2) Release velocity for the Standing Power Throw (ACFT) = 5.6 m/sec
- (3) The Standing Power Throw Gold (ACFT) standard (4.5 m) represents approximately an 8% increase in power generation (release velocity) over the Seated Power Throw (OPAT) for a fully trained Soldier. Considering Soldiers are able to use upper and lower body anaerobic power to generate release velocity for the Standing Power Throw, 4.5 m represents a lower power requirement than the Seated Power Throw (OPAT), which is required to enter the Army.

Hand Release Push-up (HRP)

- Data: since the Army has administered / collected data on the push-up as a measure of upper-body muscular endurance for almost 100 years, we used historical data and standards to establish the Gold standard for the ACFT.

- In order to minimize the impact on the force, we used the female push-up standards from the APFT as the comparative metric.

- (1) Average APFT 60-point push-up standard for females ≤ 31 years = 17.67 repetitions
- (2) The average Δ between the APFT push-up and ACFT HRP = 40% (lower)
- (3) Gold Standard HRP = $17367 \times 0.60 = 10.6$ repetitions
- (4) We rounded lower for FY20-21 to 10 repetitions for the Gold ACFT standard

Sprint – Drag – Carry (SDC)

- Applied Data: The SDC is a proxy for several CST: react to direct fire, move materials around the battlefield, extract and drag a casualty to safety. The SDC represents a merger of the sled push, sled drag, and 300m shuttle run, and approximates the minimum time to move across open

ground with materials to a wounded 185lbs Soldier (275lbs with load), render aid, and drag to a position of safety

- (1) Sprint 50 m x 3 = 80 seconds
 - (2) Carry materials 50 m = 30 seconds
 - (3) Extract and Drag casualty 50 m = 60 seconds
 - (4) Total minimum time = 170 seconds (2:50)
 - (5) The original 60-point standard based on cumulative time = 3:00 min
- We also analyzed the Fort Riley BSPRRS data for the sled drag, sled push, and 300 m loaded shuttle run for females. The average sum of these times = 3:03 min. We estimated the combined standard deviation = 0:20 seconds, which makes 2SD below the mean = 3:43 min for the SDC. We rounded up to 3:45 min for the Field Test trails.
 - The Field Test trials and work with the USACIMT / USAPFS mobile training teams (MTT) proved the 3:45 min was significantly too slow for the 60-point standard. The MTTs demonstrated you could walk the SDC 250 m course in slightly over 2:30 min. For the FY20-21 standards, we lowered the SDC time to 3:00 min, which matches our original estimated of the maximum performance time.

Leg Tuck (LTK)

- Applied Data: The leg tuck is the most important ACFT test event related to injury prevention and associated attrition. Generally, by the age of 30, most female Soldiers injuries prevent them from performing a standard 3-event APFT. One of the reasons for this problem is a lack of core strength. Empirical research has consistently demonstrated that core strength and stability is the bedrock of athletic power and inoculates Soldiers against lower back and lower body injuries. The intensity of training required to improve LTK performance is crucial to Soldier development and performance optimization.
- In order to minimize the impact on the force, we used one (1) repetition as the 60-point LTK standard for the Field Test and FY20-21.

2-mile Run (2MR)

- Empirical Data: What is the total liters of oxygen (O_2) required to move under maximal load (103 lbs) for 1 mile in 15 minutes?
 - (1) Answer = $17.2685 \text{ L} \times 2 = 34.537 \text{ L}$.
- How does that equate to running in Army Physical Fitness Uniform for 2 miles?
 - (1) Answer = 2-mile time = $34.537 \text{ L of } O_2 = 19:18 \text{ min}$
 - (2) Average Δ between APFT and ACFT 2MR times for trained Soldiers = $\sim 0:45 \text{ min}$; for untrained Soldiers = $\sim 1:30 \text{ min}$; average $\Delta = 1:00 \text{ min}$.
 - (3) $19:18 + 1:00 = 20:18 \text{ min}$; for the IOC scales we rounded up to 21:00 min
- Applied Data: 2MR 60-point score for women < 31 (80% of the women in the Army)
- 18:54, 19:36, 20:30; average = 19:40 min
 - (1) Adding in the Δ for minimally trained = 20:40; rounded up to 21:00 min.