ASVAB Validation Technical Report

Hospital Corpsman (HM)
Advanced Technical Field (ATF) Program

Zannette A. Uriell
Navy Selection and Classification Office (OPNAV N-132)

Reviewed, Approved, and Released by
Jason Jacobs-Lentz
Navy Selection and Classification Office (OPNAV N-132)

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14. ABSTRACT
The Armed Services Vocational Aptitude Battery (ASVAB) is used by the Navy to classify Sailors into occupations, or ratings. This report presents a study of the Hospital Corpsman Advance Technical Field (HM/ATF) program training data undertaken to determine if a change to the ASVAB classification composites is needed. The data analyzed and the processes used to determine the most valid options are described. The ultimate decision of the ASVAB Validation Review Committee was that the training path for this program is expected to be altered in the near future and the findings should be re-assessed after there is sufficient training data reflecting these changes.

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Introduction

There are several requirements for enlisting into any military service such as the Navy, including meeting physical, mental, and moral standards and being of age (*Requirements to Join*, n.d.). In addition, those wishing to join must have a qualifying score on the Armed Services Vocational Aptitude Battery (ASVAB), specifically the Armed Forces Qualification Test (AFQT) score calculated from specific tests in the ASVAB. The ASVAB has been used for entrance into the Navy since 1974 (*History of Military Testing*, n.d.), and contains multiple tests to assess both crystallized and fluid intelligence (see Appendix A for brief descriptions of each test, or visit https://www.officialasvab.com).

In addition to qualifying for the military, ASVAB scores are used in the Navy to determine what Navy jobs, or ratings, a recruit can possibly join. At present there are 29 composites, or combinations of ASVAB test scores, in use to determine which ratings might be suitable for the recruit (see Appendix B for composites and the ratings currently using each).

The decision of which composites are appropriate for a given rating is based upon analysis of school success. After recruit training, most recruits attend an "A" School specific to the rating, with some continuing on to advanced training ("C" School) and others joining the Fleet for their first duty assignment. Historically, the final school grade of this initial training has been used to determine selection composites (see Held, Hezlett, Johnson, McCloy, Drasgow, and Salas (2014) for more information). More recently, this has shifted to focus on First-Pass Pipeline Success (FPPS) instead of final school grades. Those with FPPS are able to join the Fleet sooner without any delays in their training and without having to be reclassified into another rating which would require starting a new training pipeline, both of which are costly to the Navy. Additionally, passing a course successfully the first time with no setback may improve a Sailor's self-confidence and morale, and potentially encourage a longer career for the Sailor.

As training changes periodically and as other societal shifts may influence ASVAB scores generally, the ASVAB Validation Review Committee (AVRC), chaired by the OPNAV Selection and Classification Office, is charged with ensuring rating selection criteria are up-to-date and reflect the requirements of the rating and the training undertaken. This report describes the re-validation effort conducted to ensure the appropriate composites are in place for the Hospital Corpsman rating, Advanced Technical Field (HM/ATF). For more information on findings for the larger portion of the HM rating, see Uriell (2023).

Hospital Corpsman Work

The Navy Enlisted Manpower and Personnel Classifications and Occupational Standards (NEOCS), specifically Volume I (available at https://www.mynavyhr.navy.mil/References/NEOCS-Manual/) is the foundation for understanding a rating and creating training for those joining the rating, and this document was consulted early in the ASVAB re-validation process for an understanding of HM work. However, the primary source of information about the rating that was used for this composite

revalidation analysis was the Navy Credentialing Opportunities On-Line (COOL) rating cards, available from https://www.cool.osd.mil/usn/ . The June 2022 COOL rating card for HM indicates:

> "Hospital Corpsman perform duties as assistants in the prevention and treatment of disease and injury and assist health care professionals in providing medical care to Naval personnel and their families. They may function as clinical or specialty technicians, medical administrative personnel and health care providers at medical treatment facilities. They also serve as battlefield corpsmen with the Marine Corps, rendering emergency medical treatment to include initial treatment in a combat environment. Qualified Hospital Corpsmen may be assigned the responsibility of independent duty aboard ships and submarines; Fleet Marine Force, Special Forces and Seabee units, and at isolated duty stations where no medical officer is available. Additionally, they perform duties as a general dental assistant to include dental infection control, dental treatment room management, preventive dentistry, comprehensive dental assisting, and intraoral radiography.
>
> WHAT THEY DO:
> - Assisting in prevention and treatment of disease and injuries;
> - Caring for sick and injured;
> - Administering immunization programs;
> - Rendering emergency medical treatment;
> - Instructing sailors and marines in first aid, self aid and personal hygiene procedures;
> - Transporting the sick and injured;
> - Conducting preliminary physical examinations;
> - Performing medical administrative, supply and accounting procedures;
> - Maintaining treatment records and reports;
> - Supervising shipboard and field environmental sanitation and preventive medicine programs;
> - Supervising air, water, food and habitability standards."

Table 1 shows an intuitive link between the COOL rating card description and the ASVAB test. While this table is not definitive, it seems that General Science and the 3 language related tests/scores are the most likely ASVAB tests/scores to be linked to HM work.

Table 1
ASVAB Linkages to the HM Rating

HM Rating Skills/Qualifications	GS	AR	WK	PC	MK	EI	AS	MC	AO	CS	VE
Prevention and treatment of disease and injury	X										
Caring for sick and injured			X								X
Administering immunization programs	X	X	X	X							X
Rendering emergency medical treatment	X										
Instructing in first aid, self aid and personal hygiene procedures	X		X	X							X
Transporting the sick and injured	X										
Conducting preliminary physical examinations	X										
Performing medical administrative, supply and accounting procedures		X	X	X	X						X
Maintaining treatment records and reports			X	X							X
Supervising shipboard and field environmental sanitation and preventive medicine programs	X		X	X							X
Supervising air, water, food and habitability standards	X		X	X							X

This report focuses only on those corpsmen who started training to become part of the Advanced Technical Field (ATF) program within the HM rating. This program encompasses Search and Rescue Medical Technicians (SMT), Fleet Marine Force Reconnaissance Independent Duty Corpsmen (SARC), or Medical Deep Sea Diving Technicians (DMT), which are briefly touched on within the paragraph taken from COOL, however each also has an expanded paragraph within COOL regarding their role, as indicated below:

> "HM - Search and Rescue Medical Technician Role
>
> Search and Rescue Medical Technicians performs aircrew and emergency medical care functions in support of Search and Rescue, MEDEVAC and CASEVAC missions for Navy and Marine Corps Aviation. Certified in Advanced Cardiac Life Support (ACLS), Advanced Trauma Life Support (ATLS) Cardiopulmonary Resuscitation (CPR), Triage, Intravenous (IV) therapy, medicine administration, use of emergency medical equipment, patient handling, and aero-medical evacuation techniques. Must be NATOPS qualified to crew position of SAR Medical Technician."

"HM - Fleet Marine Force Reconnaissance Independent Duty Corpsman Role

Fleet Marine Force Reconnaissance Independent Duty Corpsman (IDC) provides medical and operational services for Fleet Marine Forces, Special Operations Forces and Special Operations Command personnel engaged in direct action, special reconnaissance foreign internal defense, irregular and unconventional warfare independently of a medical officer. Performs clinical diagnostics, advanced paramedical skills, Advanced Cardiac Life Support (ALCS), basic surgical anesthesia, basic dental exams, and other routine and emergency medical health care procedures as required. Performs associated operational administrative and logistical duties. Supervises and manages field medical activities in a conventional or unconventional warfare environment. Orders, stores, catalogs, safeguards and distributes medical supplies, equipment, and pharmaceutical supplies. Supervises clinical and field long term care and treatment during peacetime, CONUS and OCONUS split detachment operations. Advises and provides tactical and technical guidance to the Detachment Commander, indigenous and allied personnel. Responsible for the planning, execution, and supervision of cross-training of detachment members in medical skills. Required to maintain skills and certifications in Advanced Tactical Casualty Care with a greater than 96-hour patient sustainability without evacuation or augmentation. In unconventional warfare environment, instructs medical personnel, manages guerilla hospitals and field evacuation nets; coordinates the operation, interaction and activities of medical facilities within an area of operation; manages battalion size troop medical clinic and its administrative and logistical support. Establishes a base stock of medical supplies and equipment, internal or external procurement, storage, security and distribution of those items. Coordinates veterinary training and support for area requiring animal transportation or use. When directed, conducts operational and intelligence planning, preparation and execution of detachment missions. Maintains Special Operation Forces Advanced Tactical Practitioner (ATP) requirements to include Tactical Combat Casualty Care (TCCC), USSOCOM Tactical Trauma Protocols, Basic Life Support (BLS), Prehospital Professionals (PEPP), Advanced Cardiac Life Support (ALCS), and Tactical Medical Emergencies Protocols (TMEPS). Provides health care as a non-physician health care provider when assigned to fixed medical treatment facilities."

"HM - Medical Deep Sea Diving Technician Role

Medical Deep Sea Diving Technicians assists the medical officer in the prevention and treatment of illnesses associated with deep sea diving and high-pressure conditions. Performs duties as inside tender for recompression chamber operations. Additional duties include qualifications to dive using all Air and Mixed Gas USN Diving Apparatus. Operates, tests, repairs and adjusts all USN Diving Equipment, systems, and support equipment. Operates recompression chambers. Performs underwater inspections, harbor/port/ship security inspections,

> including ordnance searching, rescue, special warfare operations, and small boat operations. Operates Swimmer Delivery Vehicle Dry-Deck Shelter systems and submarine Lock-in/Lock-out systems. The areas of knowledge and training include but are not limited to diving physics; scuba and surface-supplied air diving procedures; and recognition and treatment of diving related illnesses."

While the initial academic work for HM/ATF is the same as for HM, it may be that the "A" School experience is different since HM/ATF have a high focus on fitness and therefore may lose a large portion of study time to focus on fitness beyond what might be required of an HM who is not in the ATF program. As there is a separate course code for the two groups, it was possible to separate the data and conduct a study specific to HM/ATF.

Methods

Student Data Used

HM/ATF "A" School and "C" School data were initially analyzed. Corporate Enterprise Training Activity Resource Systems (CeTARS) data for the Course Data Processing (CDP) code 19TK (Hospital Corpsman (HM) Advanced Technical Field (ATF) Program) as well as all subsequent "C" School courses for the three types of ATF corpsman (see Table 2 for complete list of CDPs) were downloaded for those with Active Duty Service Dates (ADSD) 1 October 2016 and beyond. As the HM rating composites were created in July 2018, data with an "A" School enrollment code from before 9 November 2018 were deleted under the assumption that those going through training in the first 4 months after the creation of the composite might have been selected based on the previous ASVAB standards.

Those who had graduated or academically failed were retained in the data for analyses, as well as those who had not yet completed the course but had already had an academic setback; an academic setback even without course completion would automatically indicate they had not completed the course successfully in the first pass, which is the dependent variable being used for these analyses. Non-academic failures were removed from data prior to analyses, and non-academic setbacks were not considered in any computations. Table 2 contains the full list of CDP codes as well as the count of Sailors attending during the time period considered. In addition to the enrollment (2) and graduation (288) codes, Table 3 contains the PEVT codes applicable to each category of setback or failure within the data being used, with those in bold in the "A" School data; see the CeTARS database for full descriptions.

Table 2
CDPs Considered and Number of Records for Each

Pipeline	Course Name	CDP	Total Students	Total Graduates
ALL	HM/ATF "A" School	19TK	404	212
SMT	Naval Aircrewman Candidate School	806E	54	51
	SMT Flight Medic Course	21A8	35	30
	Survival, Evasion, Resistance, and Escape	06T8	31	31
	Survival, Evasion, Resistance, and Escape	07VH	8	8
	MH-60S SAR Medical Technician Fleet Replacement Aircrewman Category I	04Y8	8	8
	MH-60S SAR Medical Technician Fleet Replacement Aircrewman Category I	04Y5	17	17
SARC	Field Medical Service Technician	3388	84	82
	Reconnaissance Training and Assessment Program	11ZP	66	51
	Basic Reconnaissance Training Company	04HD	41	33
	Fleet Marine Force Reconnaisance Technician (SOCM)	231Z	7	5
	USMC Combatant Diver	385G	22	20
	Amphibious Reconnaissance Corpsman	429R	26	26
	Basic Airborne	2007	29	27
	Fleet Marine Force Reconnaisance Independent Duty Corpsman	10M0	3	3
	Army Sere High Risk (Level C)	21CC	4	4
DMT	Explosive Ordnance Disposal and Navy Diver Assessment And Selection Course	23YH	12	8
	Diving Medical Technician	3365	20	19

NOTE: "C" Schools changed during the time period considered; both the initial training and the replacement training are listed above.

Table 3

Category	Academic Code	Non-Academic Code
Setback	48	**73**
	51	**294**
	53	295
	56	296
	324	**298**
	855	**300**
		301
		302
		305
		308
Failure	**81**	**148**
	103	149
	106	207
	135	211
	138	**212**
	141	**214**
	142	227
	309	228
		229
		230
		231
		232
		311
		320
		970
		971
		972
		973
		986
		987
		994

(NOTE: Historically PEVT 135, 138, and 141, categorized as motivational attrition, are considered academic failures for ASVAB validation analyses as these students are judged to be unable keep up in the course.)

Because of the low number who had completed all courses as shown in Table 2, and the high rate of graduation for many of the courses as compared to 19TK, the decision was made to focus further analyses on 19TK only.

A total of 404 student records were retained for most analyses. These were categorized based upon whether they qualified based on the existing composite combination (VE+MK+GS>=156 AND AR+WK>=105 AND VE+AR+MK+GS>=210) or not. Table 4 provides the number of students, the rate of academic setbacks, the number who were still in 19TK but had already had an academic setback, graduation/failure rates, and observed FPPS rates for the total sample, for those qualified, and for those who received a waiver (12-point waiver allowed for a 4-test composite, 9-point waiver allowed for a 3-test composite, and 6-point waiver allowed for a 2-test composite; see *Class "A" School and Rating Entry Requirements* (2016)).

Table 4
Setback, Graduation, and FPPS Rates for Those Qualified or Waivered into Training

	Student #	% of Sample	Academic Setback Rate	Academic Setback, Still in Training	Grad Rate	Academic Failure Rate	Observed FPPS%
Total Sample	404	100.0%	0.74%	0	52.5%	47.5%	52.2%
Qualified	389	96.3%	0.77%	0	53.2%	46.8%	53.0%
Waivered	15	3.7%	0.0%	0	33.3%	66.7%	33.3%

Table 4 shows that most of the sample was qualified based on the composites in place; only 4% were not qualified and had received a waiver. Academic setbacks were rare, so the graduation rate and the FPPS rate are similar. For the total sample shown in the top row, just over half graduated and were able to complete the course successfully the first time, similar to those who were qualified based on the composite. Graduation rate and FPPS for those who received a waiver show 1 of 3 were able to graduate and did so without an academic setback.

As the ASVAB is largely based on academic skills and knowledge, analyses focused on the PEVTs that were academic; all those who dropped on request (not clearly an academic issue; PEVT 135) or had a PT failure (PEVT 211, 212, and 214) were removed from analyses only for Table 5. (NOTE: PT Failures are non-academic failures, so data of some previously eliminated Sailors may be included in these analyses.) Graduation rates were somewhat higher, rising from 52.5% graduation rate for the entire sample to 66.9% for the sample without DOR/PT failures considered, indicating the composites in place still lead to a large portion of PEVTs identified as purely academic failures.

Table 5
Setback, Graduation, and FPPS Rates for Those without Drop on Request or PT Failures

	Student #	% of Sample	Academic Setback Rate	Academic Setback, Still in Training	Grad Rate	Academic Failure Rate	Observed FPPS%
Total Sample	317	100.0%	0.63%	0	66.9%	33.1%	66.6%
Qualified	304	95.9%	0.66%	0	68.1%	31.9%	67.8%
Waivered	13	4.1%	0.0%	0	38.5%	61.5%	38.5%

If the minimum scores of the composite are not met, a waiver may be granted per MILPERSMAN 1306-618, up to 3 points per test on a multi-test composite. It may be that since the three composites were all required (i.e., not alternatives to each other), some recruits were granted waivers based on 9 tests or 27 total points, as 1 person had 26 points waived. Table 6 shows the number who received waivers at different point totals as well as their success rates.

Table 6
Count and Disposition of those Receiving Waivers

Total Points Waivered	Number of Waivers Given	FPPS Rate	Graduation Rate	Academic Failure Rate	Academic Setback Rate
2	2	100%	100%	0%	0%
3	2	50%	50%	50%	0%
4	2	0%	0%	100%	0%
6	2	0%	0%	100%	0%
7	1	0%	0%	100%	0%
8	1	0%	0%	100%	0%
9	1	0%	0%	100%	0%
10	1	100%	100%	0%	0%
11	1	0%	0%	100%	0%
15	1	100%	100%	0%	0%
26	1	0%	0%	100%	0%

Table 7 provides the descriptive details for each ASVAB subtest for the final sample of 404 Sailors as well as the Armed Forces Qualification Test (AFQT), which is a combination of four of the ASVAB tests (see https://www.officialasvab.com for more details). For each ASVAB test, 50 is the mean and the standard deviation is 10.

Table 7
ASVAB Test Descriptives for HM/ATF Sample

Test	**Count**	**Min**	**Max**	**Mean**
GS	404	42	76	59.14
AR	404	39	72	58.18
WK	404	44	71	57.08
PC	404	45	69	57.68
MK	404	43	72	58.26
EI	403	30	75	55.98
AS	404	30	74	51.56
MC	404	27	75	58.31
VE	404	49	71	57.60
AO	370	30	69	59.83
CS	129	35	72	55.52
AFQT	404	42	99	78.56

Histograms were created of the composite scores. Figure 1 shows the first composite (GS+MK+VE), which had a mean score of 175.0. Figure 2 shows the second composite (AR+WK), with a mean of 115.3, while Figure 3 shows the third composite (VE+AR+MK+GS), with a mean of 233.2. When comparing three-test and two-test scores to a four-test score, linear

equating can be used to show that the mean of 233 on a four-test composite is equivalent to 175 for a three-test composite and about 116 on a two-test composite.

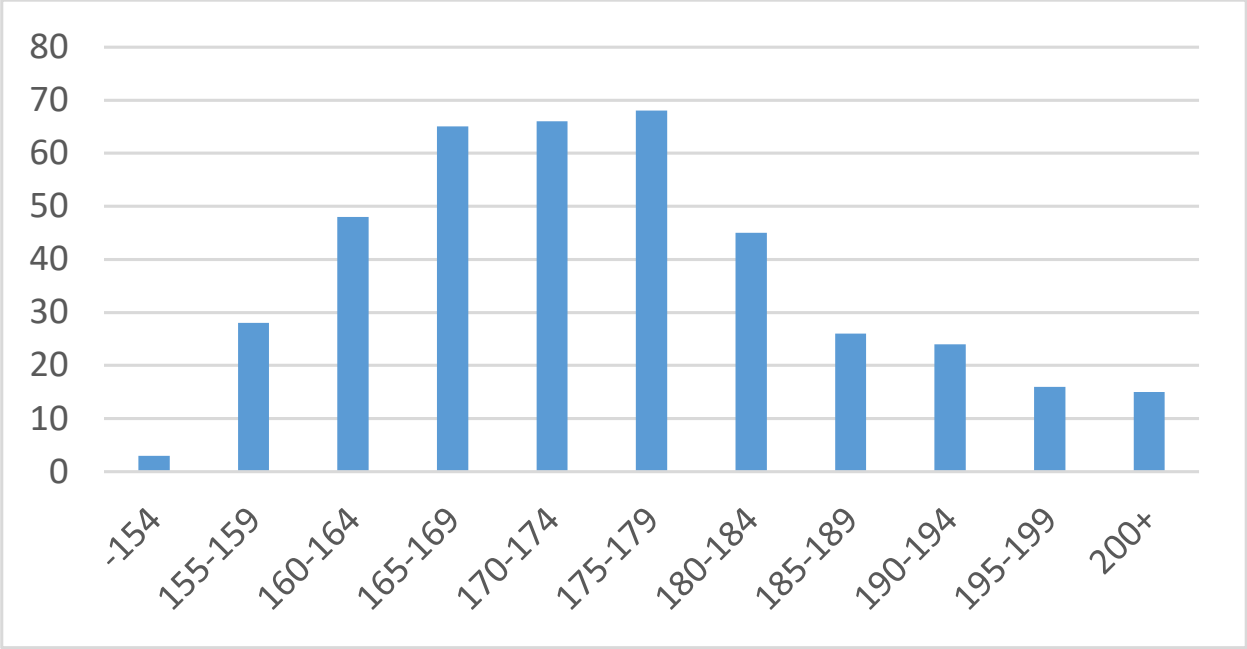

Figure 1. GS+MK+VE Scores of HM/ATF Students.

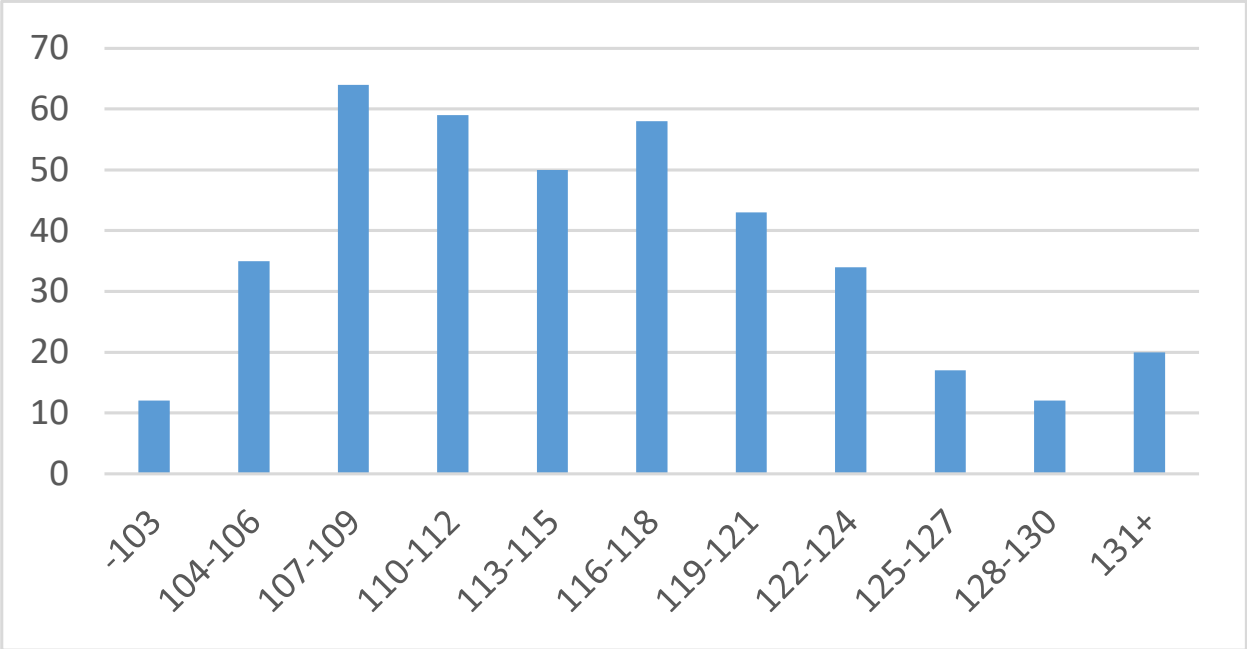

Figure 2. AR+WK Scores of HM/ATF Students.

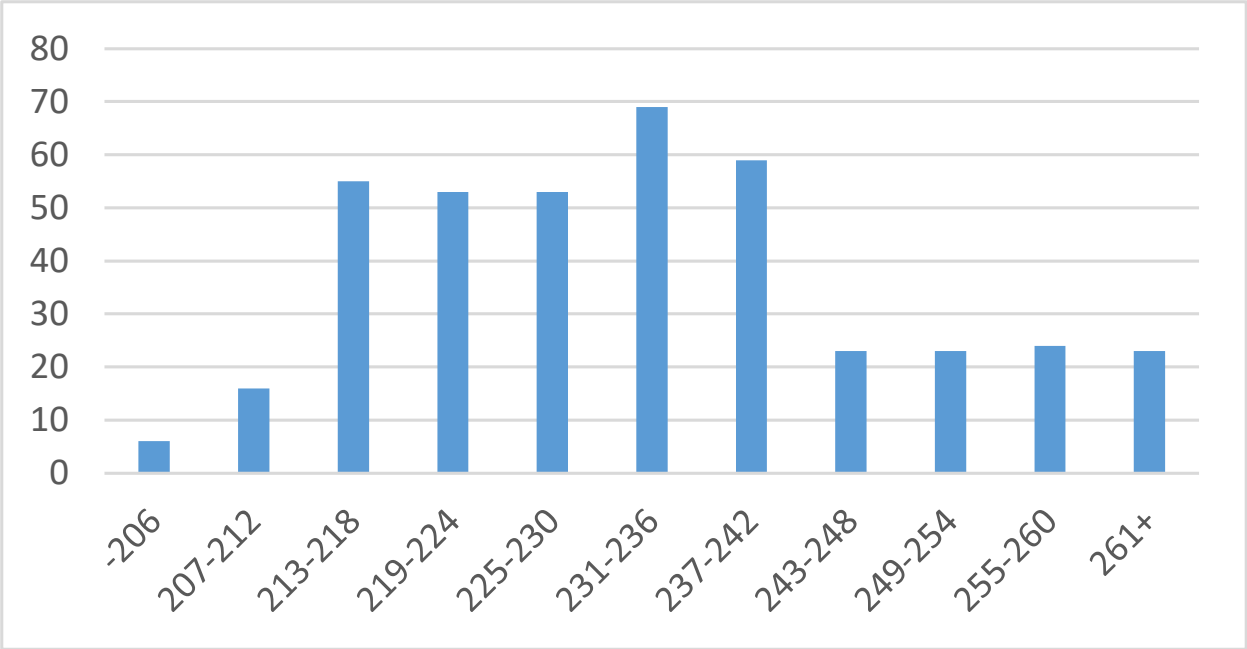

Figure 3. VE+AR+MK+GS Scores of HM/ATF Students.

Validity Coefficients

Receiver operating characteristic (ROC) curves were produced for all operational composites; Figure 4 shows the VE+MK+GS ROC curve, Figure 5 shows the AR+WK curve, and Figure 6 shows the VE+AR+MK+GS curve. The diagonal line of each indicates random classification. All three are better in the lower left regions of the graph, showing a lower likelihood of predicting False Positives. The area under the curve (AUC) computations are .6175 for the first, .6080 for the second, and .6186 for the third, showing little difference between the three composites.

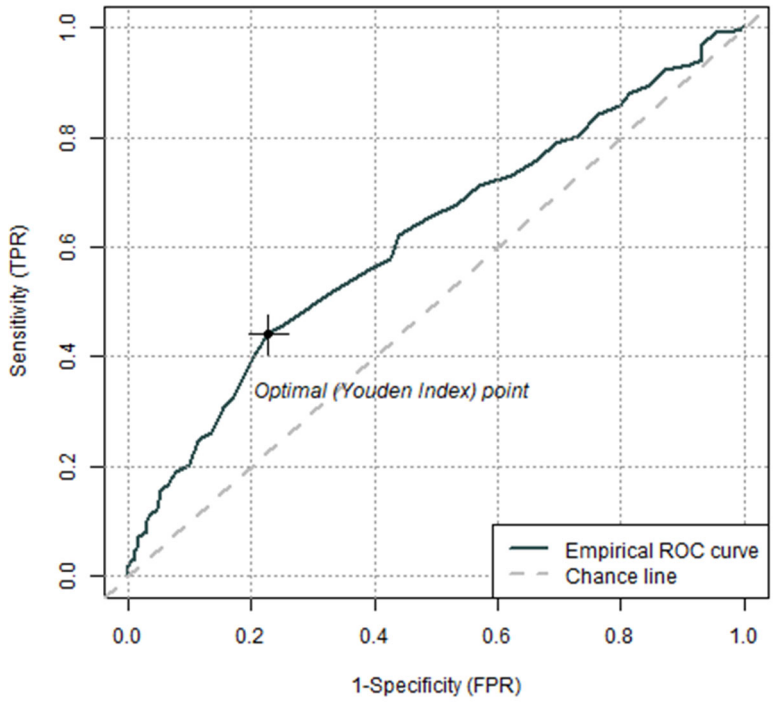

Figure 4. VE+MK+GS ROC.

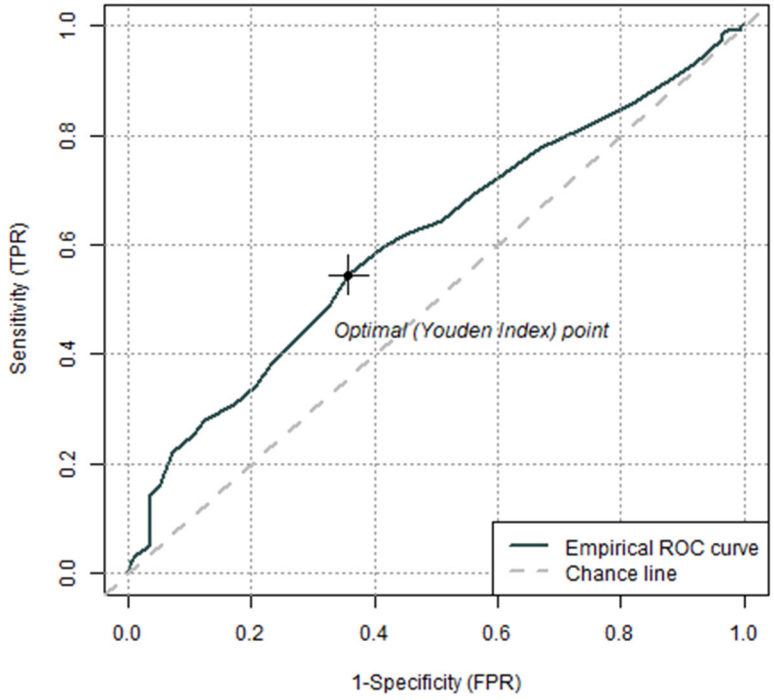

Figure 5. AR+WK ROC.

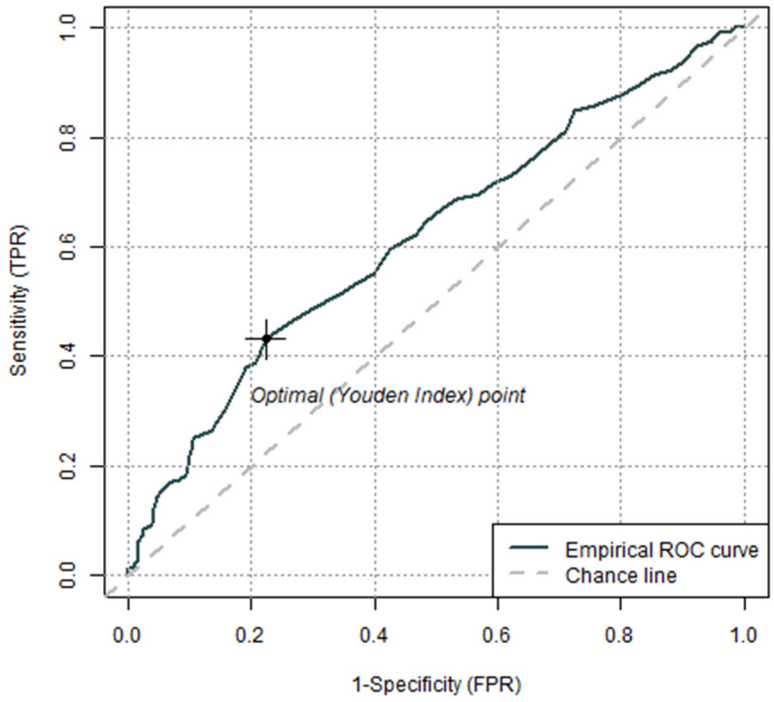

Figure 6. VE+AR+MK+GS ROC.

Because of the low number of CS scores, these were dropped entirely from further analyses. Additionally, any HM/ATF students who had incomplete test data were excluded, leading to 369 being included in further analyses.

Correlations were computed between each test and the FPPS variable for CDP 19TK. These uncorrected correlations are included in Table 8, by family of test/composite. Because the data has been restricted by the selection process, a correction was made to these validities to adjust for range restriction based on PAY97 norms (Segall, 2004). A final correction was applied to account for FPPS being a dichotomous variable (see appendix C for a brief description of corrections, or Held, Carretta, Hezlett, Johnson, Mendoza, Abrahams, Drasgow, McCloy, and & Wolfe (2015) for a detailed description). Those highlighted in Table 8 are the highest fully corrected validities, and the three composites underlined are those currently in use for HM/ATF selection.

Table 8
Composite Validities

Composite Family	Composite	Uncorrected Validity	Validity Corrected for Range Restriction to PAY97	Validity Corrected for Range Restriction & Dichotomy (Fully Corrected)
ASVAB test	AO	0.0933	0.3578	0.4490
ASVAB test	AR	0.1389	0.4267	0.5354
ASVAB test	AS	0.0939	0.2582	0.3240
ASVAB test	EI	0.1046	0.3494	0.4384
ASVAB test	GS	0.0987	0.4132	0.5184
ASVAB test	MC	0.1823	0.4064	0.5099
ASVAB test	MK	0.2330	0.4807	0.6032
ASVAB test	PC	0.1538	0.4538	0.5694
ASVAB test	VE	0.1847	0.4723	0.5926
ASVAB test	WK	0.1565	0.4373	0.5487
Administrative	MK+VE	0.2605	0.5205	0.6532
Administrative	PC+MK	0.2451	0.5106	0.6407
Administrative	AR+PC+MK	0.2269	0.5007	0.6282
Mechanical	AR+AS+MC	0.1794	0.4283	0.5375
Mechanical	MK+AS+AO	0.1959	0.4703	0.5901
Mechanical	AR+MK+AS	0.2122	0.4789	0.6009
Mechanical	MK+AS+VE	0.2393	0.5081	0.6376
Operations	AR+MK+AS+VE	0.2335	0.5033	0.6316
Operations	GS+AR+2MK	0.2187	0.4924	0.6179
Operations	AR+MK+AO+VE	0.2191	0.5008	0.6284
Operations	AR+MK+EI+VE	0.2254	0.5029	0.6310
Operations	GS+MK+MC+VE	0.2327	0.5102	0.6402
Operations	MK+EI+VE	0.2319	0.5082	0.6377
Specialized	AR+VE	0.1926	0.4829	0.6059
Specialized	GS+MK+VE	0.2189	0.5038	0.6321
Specialized	AR+WK	0.1849	0.4726	0.5930
Specialized	GS+AR+MK+VE	0.2155	0.5000	0.6274
Specialized	GS+AR+MK	0.1985	0.4851	0.6087
Specialized	GS+MK+2VE	0.2203	0.5035	0.6318
Technical	AR+MK+MC+VE	0.2463	0.5143	0.6453
Technical	GS+AR+MK+EI	0.1930	0.4826	0.6056
Technical	GS+EI+MC	0.1599	0.4359	0.5469
Technical	GS+AR+EI+MC	0.1728	0.4582	0.5749

Results

To determine the results of changes to selection composites, 12 months of accession data (ADSD 11 October 2021 to 10 October 2022) were selected, which included 34,595 records. Males were 75.6% of this population; Whites were 44.3%, 23.4% were Hispanic, and 21.4% were African American, with the remainder being another, unknown, or mixed race. ASVAB test score descriptives for this population are provided in Table 9.

Table 9
ASVAB Test Descriptives for 12 Month Accessions

Test	Count	Min	Max	Mean
GS	34564	22	79	52.60
AR	34566	24	79	53.02
WK	34563	21	76	52.41
PC	34562	25	74	52.99
MK	34565	29	73	54.79
EI	34512	20	80	50.44
AS	34560	20	80	46.36
MC	34556	22	80	52.04
VE	34565	21	74	52.77
AO	31651	26	70	56.61
CS	7155	22	72	60.78
AFQT	34579	5	99	60.75

Standardized group test score mean differences (Cohen's d) were computed for two of the current composites as well as one with higher validity and one that is an alternative for HM (non-ATF) selection. Table 10 shows the differences for females compared to males as well as African Americans and Hispanics compared to Whites. The composite with higher validity (AR+MK+MC+VE) is the worst of the chosen four composites for African Americans when compared to Whites, while the HM-alternative composite (PC+AR+MK) is better for both race/ethnic groups and worst for Females as compared to Males.

Table 10
Standardized Group Mean Score Differences Based on 12 Months of Accessions

	GS+MK+VE	GS+AR+MK+VE	AR+MK+MC+VE	AR+PC+MK
Female-Male	-.467	-.493	-.558	-.712
African American-White	-.917	-.945	-1.019	-.609
Hispanic-White	-.609	-.573	-.582	-.365

Combinations of composites were considered such that expected graduation rate would at least maintain what is currently being achieved, would be an incremental change from composites currently in place, and would increase the possible pool of candidates to attend "A" School. Table 11 provides the best candidates considered to meet these criteria. In addition to qualification, graduation, and FPPS rates, Table 11 also shows the ratios of percentage of subgroups qualifying, particularly female compared to male and African American and Hispanic compared to White.

Table 11
Summary of Qualification Standards Options Considered

	VE+MK+GS>=156 AND AR+WK>=105 AND VE+AR+MK+GS>=210	VE+MK+GS>=215 AND GS>=50	VE+MK+GS>=163 OR AR+MK+MC+VE>=217	GS+AR+MK+VE>=218 OR GS+MK+2VE>=218 OR AR+PC+MK>=164
	Current Operational Standard	Option 1	Option 2	Option 3
QR	44.0%	44.6%	47.3%	49.2%
Difference from Current Qual #	---	+187	+1130	+1785
% Qual F::M	.583	.583	.594	.676
% Qual AA::W	.383	.391	.392	.444
% Qual H::W	.600	.585	.614	.656
Predicted Grad Rate	54.0%	54.0%	54.5%	54.5%
Predicted FPPS	53.7%	53.8%	54.2%	54.2%

Table 11 shows that Option 3 is expected to maintain or slightly increase graduation rate from what is currently operational, but also would open the possibility of attending training to an additional 1,785 Sailors. This option also improves the gender and racial qualification comparisons over what is currently in place.

Discussion and AVRC Decision

As only half of those who start the HM/ATF course are able to graduate, it would seem that a set of composites could be selected that could improve the graduation rate. The cost of doing this however might be the qualification rate, something that has been indicated by the AVRC to be of key interest while the Navy is having difficulty recruiting (see, for example, Anderson, 2022). Therefore, a consideration was made for a cohesive set of composites for the entire community instead, and was recommended to the AVRC.

When the AVRC met in March of 2023 to discuss HM/ATF composites, much of the discussion focused on PEVT 135, which is non-graduation due to a student requesting to drop from the training. Several training courses, including those for HM/ATF, are considered to be high-risk training, defined as training that "…exposes the crew, staff, students, and assets to the potential risks of death, permanent disability, or loss during training," (Chief of Naval Operations, 2017), and the ability to drop on request is seen as risk management to avoid severe injury or death during training (see, for example, Farberov, 2022; Moore, 1988). Within CeTARS, PEVT 135 is listed as non-academic non-graduation, but ASVAB validations have historically considered this as academic, or not being able to keep up with the course. Prior to deciding upon composites for HM/ATF, the AVRC requested additional analyses to better determine if this should be counted as an academic or non-academic failure.

While attempting to gather additional data for the AVRC, DOR-related events occurred which indicated a change to HM/ATF standards should be delayed. The first related to DOR requests specifically; Navy Education and Training Command was tasked with better defining what training is to be considered high-risk, how and when students are told that DOR is an option, and whether a DOR should always indicate end of training course as opposed to end of a particular training evolution.

Another DOR-related initiative relates to the HM/ATF training path. Beginning in late Spring 2023, HM/ATF trainees are expected to arrive at training 30 days prior to class convene. During those 30 days, they are expected to have training specific to physical fitness, including movement and body dynamics, in hopes of better preparing students for the physical rigors required during their training. This effort is likely a replacement to the Dive Motivator at RTC that was recently terminated. This program was open to Warrior Challenge ratings, which HM/ATF became recently, and provided additional physical fitness mentorship during RTC (*Dive motivator: starting off on the right flipper* ...., 2004).

When the AVRC met again in May 2023, there was no disagreement with maintaining HM/ATF composites as they currently are and re-evaluating HM/ATF composites in the future, once the training path and DOR issues have stabilized.

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Appendix A

Description of the ASVAB and Additional Selection Tests

Test Type	Test Name and Abbreviation	Test Description
Standard ASVAB	General Science (GS)	Knowledge of physical and biological sciences
	Arithmetic Reasoning (AR)	Ability to solve arithmetic word problems
	Word Knowledge (WK)[a]	Ability to select the correct meaning of words presented in context and correct synonyms
	Paragraph Comprehension (PC)[a]	Ability to obtain information from written passages
	Mathematics Knowledge (MK)	Knowledge of high school mathematics principles
	Electronics Information (EI)	Knowledge of electricity and electronics
	Auto and Shop Information (AS)	Knowledge of automobile and shop technologies, tools, and practices
	Mechanical Comprehension (MC)	Knowledge of mechanical and physical principles
	Assembling Objects (AO)	Ability to determine correct spatial forms from their separate parts and connection points (not administered in all versions)
Special Tests (May be Given in Conjunction with ASVAB)	Coding Speed (CS)	Ability to quickly identify correct word/number pairings from a key with many options
	MCt	Ability to maintain value of 3 counters that increment and decrement simultaneously
	Cyber Test (CT)	Information and communications technology literacy
	Navy Advanced Placement Test (NAPT)	Knowledge of advanced physics, mathematics, and chemistry
	Defense Language Aptitude Battery (DLAB)	Aptitude to learn a foreign language

[a] WK and PC are combined to form the Verbal (VE) composite that is a component of the AFQT and several Navy ASVAB classification composites.

Appendix B
Current Composites in Use Across All Ratings

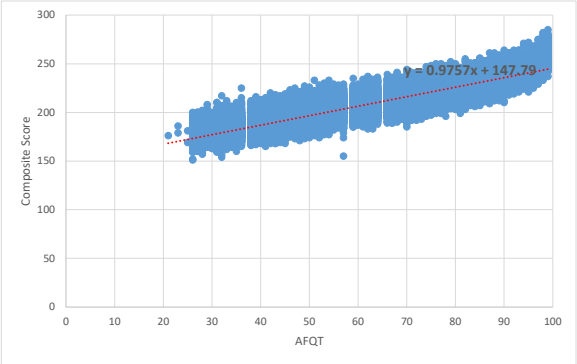
Composite Name	Composite Calculation	Rating/Program Entry Standards
Administration 1	VE+MK	CTI, LN, PS, QM, RP, YN
Administration 2	MK+CS+VE	OS, PS, RP, YN
Administration 3	PC+MK	CTR
Administration 4	AR+PC+MK	AC, CTR, HM
Cyber 1	MK+VE+CT	CTN, IT/ATF, IT/SG, ITS
Cyber 2	AR+MK+CT	CTT/AEF, CTT/SG
Mechanical 1	AR+AS+MC	BU, CM, EO, SW
Mechanical 2	MK+AS+AO	AO, AS, BM, MR, PR
Mechanical 3	AR+MK+AS	UT
Mechanical 4	MK+AS+VE	AD
Operations 1	AR+MK+AS+VE	ABE, ABF, ABH, AIRC, AIRR, AM, AME, AN (APACT), AO, BM, DC, EN, FN (E/PACT), GSM, HT, MM, MR, PR
Operations 2	GS+AR+2MK	AECF, CTN, CTT/SG, EA, ET, FC, FCA, GM, ITS, OS, SB
Operations 3	AR+MK+AO+VE	AE, AME, AT, AV, BU, EN, GSM, IC, IC/ATF, MM, MN, MT, SO, STG, STG/AEF
Operations 4	MK+MC+CS+VE	SO
Operations 5	AR+MK+EI+VE	AS, CTM, IT/SG, MMA, MMS, TM
Operations 6	GS+MK+MC+VE	QM
Operations 7	MK+EI+VE	AD
Specialized 1	AR+VE	AZ, CS, EOD, LN, LS, MC, ND, RS, SB, SN (S/PACT), SO
Specialized 2	GS+MK+VE	AG, CTI, HM/ATF, IT/ATF, IT/SG, NC
Specialized 3	AR+WK	HM/ATF
Specialized 4	GS+AR+MK+VE	HM, HM/ATF, IS, IT/ATF, ITS
Specialized 5	GS+AR+MK	AG
Specialized 6	GS+MK+2VE	HM
Specialized 7	AR+MK+MC+VE+NAPT	EM(NUC), ET(NUC), MM(NUC), NUC
Specialized 8	GS+AR+MK+EI+NAPT	EM(NUC), ET(NUC), MM(NUC), NUC
Technical 1	AR+MK+MC+VE	AC, AE, AIRC, AIRR, AM, AS, AT, AV, CSS, CTN, DC, EM, EM(NUC), ET(NUC), ETV, FT, FN (E/PACT), GSE, HT, LSS, MA, MM(NUC), MN, MR, MT, NUC, SECF, STS, YNS
Technical 2	GS+AR+MK+EI	AECF, CE, CSS, CTT/AEF, EM, EM(NUC), ET, ET(NUC), ETV, FC, FCA, FT, GM, GSE, IC, IC/ATF, LSS, MM(NUC), NUC, SECF, STS, STG, STG/AEF, UT, YNS
Technical 3	GS+EI+MC	EOD, SO
Technical 4	GS+AR+EI+MC	MMA, MMS, TM

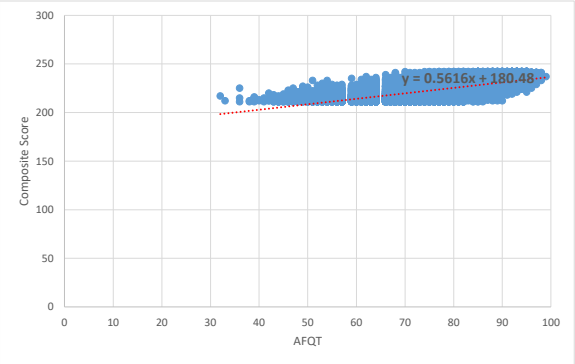
As of 4/11/2023.

Appendix C
Corrections of Validity Coefficients

Two corrections are executed before determining the fully corrected validity coefficients used to determine the best-fitting composites. The first correction is for range restriction, and the second is for dichotomy. A simplistic explanation of both is included below, with more detailed information provided in Held, Carretta, Hezlett, Johnson, Mendoza, Abrahams, Drasgow, McCloy, & Wolfe (2015).

Because a selection for the rating has already occurred prior to analyzing the training data, the validity coefficients initially computed do not cover the entire spectrum of possible ASVAB scores, as can be seen in the two graphs below with the left graph showing the complete spectrum of AFQT scores vs a composite AFQT score, and the right graph showing all AFQT but only the composite scores above a selected cutscore of 210. The correlation line equation is different between the two graphs because of the restriction in range of the graph on the right.





Matrix algebra is used to correct for this range restriction by adjusting the variance/covariance matrix of the test scores and FPPS to the PAY97 variance/covariance matrix created by Segall (2004) in the PAY97 norming process. Once each individual ASVAB score is corrected, each composite of ASVAB scores can also be corrected as laid out in Held, et al (2015).

Correcting for dichotomization accounts for the dependent variable (FPPS in this report) being a 0 or 1, which is actually a measure of an underlying continuous variable Final School Grade. The Table of Normal Deviates and Ordinates is consulted to determine the y ordinate that corresponds to the FPPS rate ("B Area in the larger portion" within the table). Each range restricted correlation is then multiplied by the calculated dichotomy correction factor $\frac{\sqrt{FPPS*(1-FPPS)}}{y-ordinate}$.

Hospital Corpsman (HM) ASVAB Revalidation

Zannette A. Uriell
Navy S&C

Background

- **Navy S&C develops and monitors ASVAB standards for all Navy ratings**
  - Goal is to balance rating qualification rate and training performance
  - About 18 months after any change in selection standards, a retrospective is conducted to determine if change is functioning as expected

- **HM rating standards prior to December 2020**
  - VE+MK+GS ≥ 156
- **HM rating standards as of December 2020**
  - VE+AR+MK+GS ≥ 209 OR MK+GS+2VE ≥ 209
- **HM retrospective analyses in August 2022 showed First Pass Pipeline Success (FPPS) decline, from 85.8% expected to 73.79% observed**

- **HM/ATF rating standards as of July 2018**
  - VE+MK+GS ≥ 156 AND AR+WK ≥ 105 AND VE+AR+MK+GS ≥ 210
- **HM/ATF retrospective analyses in August 2022 showed a graduation rate of 48%**

Study Goals

- **In ideal Navy, improve FPPS to save money in training time and lessen aggravation due to training/reclassification of Sailors**

- **In recruiting-challenged Navy, maintain or improve graduation rate while increasing number who would qualify for training**
  - Use FPPS predictions to determine most valid composites (FPPS and graduation are generally related)
  - Test most valid composites and linescores to determine graduation and qualification rates
  - Consider adjustment of linescore further to account for unique recruiting environment, similar to temporary adjustments to other ratings based on rating complexity (medium) and findings of waiver analyses

About HM

- Hospital Corpsman perform duties as assistants in the prevention and treatment of disease and injury and assist health care professionals in providing medical care to Naval personnel and their families
- They may function as clinical or specialty technicians, medical administrative personnel and health care providers at medical treatment facilities
- They also serve as battlefield corpsmen with the Marine Corps, rendering emergency medical treatment to include initial treatment in a combat environment
- Qualified Hospital Corpsmen may be assigned the responsibility of independent duty aboard ships and submarines; Fleet Marine Force, Special Forces and Seabee units, and at isolated duty stations where no medical officer is available
- Additionally, they perform duties as a general dental assistant to include dental infection control, dental treatment room management, preventive dentistry, comprehensive dental assisting, and intraoral radiography

– Navy COOL, June 2022

HM Linkage to ASVAB

	GS	AR	WK	PC	MK	EI	AS	MC	AO	CS	VE
Prevention and treatment of disease and injury	X										
Caring for sick and injured			X								X
Administering immunization programs	X	X	X	X							X
Rendering emergency medical treatment	X										
Instructing in first aid, self aid and personal hygiene procedures	X		X	X							X
Transporting the sick and injured	X										
Conducting preliminary physical examinations	X										
Performing medical administrative, supply and accounting procedures		X	X	X	X						X
Maintaining treatment records and reports			X	X							X
Supervising shipboard and field environmental sanitation and preventive medicine programs	X		X	X							X
Supervising air, water, food and habitability standards	X		X	X							X

From HM COOL rating card, "What They Do"

HM Accessions

- **Accessions have changed since 2018, especially noticeable between 2019 and 2020 (when the HM (non-ATF) composites were adopted), and between 2021 and 2022**
- **Per July 2022 Enlisted Recruiting Manual, all utilize the same composites/scores except for HM/ATF**

Pride Rating/ Program	2018	2019	2020	2021	2022	2023
HM/5YO	3237	3067	2072	1126	3627	3039
HM/ATF	---	186	186	164	140	210
HM/TAR	16	32	38	88	78	22
HM/SG	2	1	3	3	2	3
HMBHT/ATF	---	---	---	12	18	23
HMDA/5YO	289	359	394	253	149	270
HM/NAT	114	206	284	374	491	221
HMDA/NAT	98	43	36	3	0	0
HMDH/SG	---	---	---	---	12	12
HMFM/NAT	129	89	128	36	0	0

HM (non-ATF) Findings

CDP 05JP Data Included

- **All those who started CDP 05JP and had a final disposition (academic failure or graduation) or who had an academic setback in 05JP but no final disposition (and therefore were not going to have FPPS) included, regardless of Pride Rating/Program**

Pride Rating/ Program	Student Number	AS Rate	AS Still in Training	Grad Rate	AF Rate	FPPS
HM/5YO	1894	.2492	76	.8606	.0993	.7307
HM/ATF	9	0	0	1.0000	0	1.0000
HM/TAR	94	.1702	4	.8617	.0957	.8298
HM/SG	1	0	0	1.000	0	1.0000
HM/NAT	389	.1620	8	.9203	.0591	.8278
HMBHT/ATF	24	.1250	1	.9583	0	.8750
HMDA/5YO	245	.2776	2	.8980	.0939	.7102
HMDA/NAT	3	.3333	0	1	0	.6667
HMFM/NAT	19	.1579	0	1	0	.8421
Reclass	142	.2535	8	.8803	.0634	.7394

Note: Those who had a Pride Rating other than HM or related are grouped as “Reclass”.
Data with CDP 05JP start date of 4/1/2021 through 10/10/2022.

HM vs HMDA

- **HMDA data was separated from the HM (non-ATF) data; because there is no significant difference between groups, analyses are based upon all HM that are not HM/ATF**

Pride Rating/ Program	Student Number	AS Rate	AS Still in Training	Grad Rate	AF Rate	FPPS
HM (5YO, FTS, NAT, SG)	2378	.2317	88	.8705	.0925	.7506
HMDA (5YO, NAT)	248	.2782	2	.8992	.0927	.7097

Data with CDP 05JP start date of 4/1/2021 through 10/10/2022.

Findings – CDP 05JP

- **Observed course FPPS (74.9%) much lower than was predicted (85.8%)**
- **Majority are qualifying based upon both composites**

CDP 05JP	Student #	% of Sample	Academic Setback Rate	Academic Setback Still in Training	Grad Rate	Academic Failure Rate	Observed FPPS%
Total Sample	2820	100.0%	0.2348	99	0.8755	0.0894	0.7489
Qualified Only Through VE+AR+MK+GS>=209	206	7.3%	0.2427	5	0.9078	0.0680	0.7476
Qualified Only Through MK+GS+2VE>=209	336	11.9%	0.3571	18	0.7708	0.1756	0.6042
Qualified On Both	1599	56.7%	0.1614	40	0.9337	0.0413	0.8305
Qualified On Either	2141	75.9%	0.1999	63	0.9057	0.0649	0.7870
Waivered	679	24.1%	0.3446	36	0.7806	0.1664	0.6289

Data with CDP 05JP start date of 4/1/2021 through 10/10/2022.
Includes all Pride Rating Codes (SG, 5YO, ATF, FTS, NAT) through this CDP.

HM (non-ATF) - Fully Corrected Validity Coefficients and Diversity

- **Composites with highest validity coefficients (after corrections) listed below for comparison**

Composites	Composite (Family)	Fully Corrected Validity Coefficients n=2620 with AO	Standardized Group Mean Score Differences: 12month Accession Population (n=34,595)		
			F-M	AA-W	H-W
GS+AR+MK+VE	SPEC4	0.7585	-0.493	-0.945	-0.573
GS+MK+2VE	SPEC6	0.7356	-0.470	-0.913	-0.628
AR+PC+MK	ADMIN4	0.7743	-0.337	-0.764	-0.430
PC+MK	ADMIN3	0.7691	-0.231	-0.652	-0.424
GS+AR+2MK	OPS2	0.7620	-0.379	-0.799	-0.446
GS+AR+MK	SPEC5	0.7554	-0.465	-0.902	-0.507
AR+MK+AO+VE	OPS3	0.7550	-0.344	-0.861	-0.412
AR+MK+EI+VE	OPS5	0.7510	-0.596	-0.976	-0.592
MK+VE	ADMIN1	0.7616	-0.307	-0.716	-0.486
AR+MK+MC+VE	TECH1	0.7411	-0.558	-1.019	-0.582
GS+MK+VE	SPEC2	0.7458	-0.468	-0.917	-0.609

* Effect Size, or “Cohen’s d”, are terms used for measurement of group test score differences with .20 considered small, .50 moderate, and .80 large, with zero indicating no difference.

HM (non-ATF) Options Under Consideration

Same or better graduation rate, with more qualifying

1. **No change at present**

2. **Keep GS+AR+MK+VE and change 2nd for AR+PC+MK**
   - Small change, higher validity coefficient than current 2nd equation

3. **Keep GS+MK+2VE and change 1st for AR+PC+MK**
   - Small change, higher validity coefficient than current 1st equation

4. **Keep both composites and add AR+PC+MK as alternate**
   - Small change from current, provide additional way of qualifying that is not science related

Predicted HM (non-ATF) FPPS with Individual Composites

- Possible scores and impact on FPPS, Grad Rate, and Qualification Rate (QR) listed below, with the bold scores being the current cutscore and the maximum waiver currently possible

Cutscore Analysis for Predicted FPPS at or above Key Scores Applied to 12month Navy Accessions N=34,595

Transformed Score	GS+AR+MK+VE (Current - Composite 1)				GS+MK+2VE (Current - Composite 2)				AR+PC+MK (Possible Composite)			
	Score	Pred. FPPS	Pred. Grad	QR	Score	Pred. FPPS	Pred. Grad	QR	Score	Pred. FPPS	Pred. Grad	QR
212	212	86.1	94.9	48.7	212	83.3	92.7	49.3	159	85.7	94.7	50.8
209	**209**	**84.8**	**94.2**	**53.5**	**209**	**82.3**	**92.1**	**54.2**	157	84.6	94.1	55.0
206	206	83.5	93.4	58.1	206	81.2	91.4	59.1	154	82.9	93.1	61.8
203	203	82.1	92.4	62.9	203	80.1	90.7	63.9	152	81.7	92.3	66.4
200	200	80.7	91.4	67.7	200	78.9	90.0	68.7	150	80.5	91.4	70.9
197	**197**	**79.2**	**90.3**	**72.5**	**197**	**77.8**	**89.2**	**73.4**	148	79.2	90.6	75.7

Notes.
1. Tests transformed to be equivalent to a 4-test score.
2. 12-month Navy accessions 10/11/2021 – 10/10/2022.

Summary of Full Options – HM (non-ATF)

- **Combining option 1 and option 2 increases the QR from those options while only slightly decreasing expected FPPS**

	Qualification Standard			
	VE+AR+MK+GS ≥ 209 or GS+MK+2VE ≥ 209	VE+AR+MK+GS ≥ 207 or AR+PC+MK ≥ 155	GS+MK+2VE>=208 Or AR+PC+MK>=156	GS+AR+MK+VE>=208 Or GS+MK+2VE>=208 Or AR+PC+MK>=156
	[Current]	[Option 2]	[Option 3]	[Option4]
QR	58.7%	64.0%	65.9%	66.5%
Diff from Current #	---	+1860	+2519	+2727
%Qualified F::M	.684	.766	.778	.774
%Qualified AA::W	.491	.564	.577	.576
%Qualified H::W	.690	.769	.766	.768
Predicted Grad	93.1%	93.4%	93.4%	93.3%
Predicted FPPS	83.3%	83.3%	83.5%	83.2%

*12-month Navy accessions 10/11/2021 – 10/10/2022.

HM (non-ATF) Recommendation 1

- **Issue memo for PERMANENT change of standards to adopt combination of composites:**
  - Highest validity for FPPS
  - At least maintains graduation rate
  - At least maintains (or nearly maintains) FPPS
  - Increases qualification rate the most
  - Has least changes from current
  - Ideally improves demographic subgroup comparisons

GS+AR+MK+VE>=208

Or

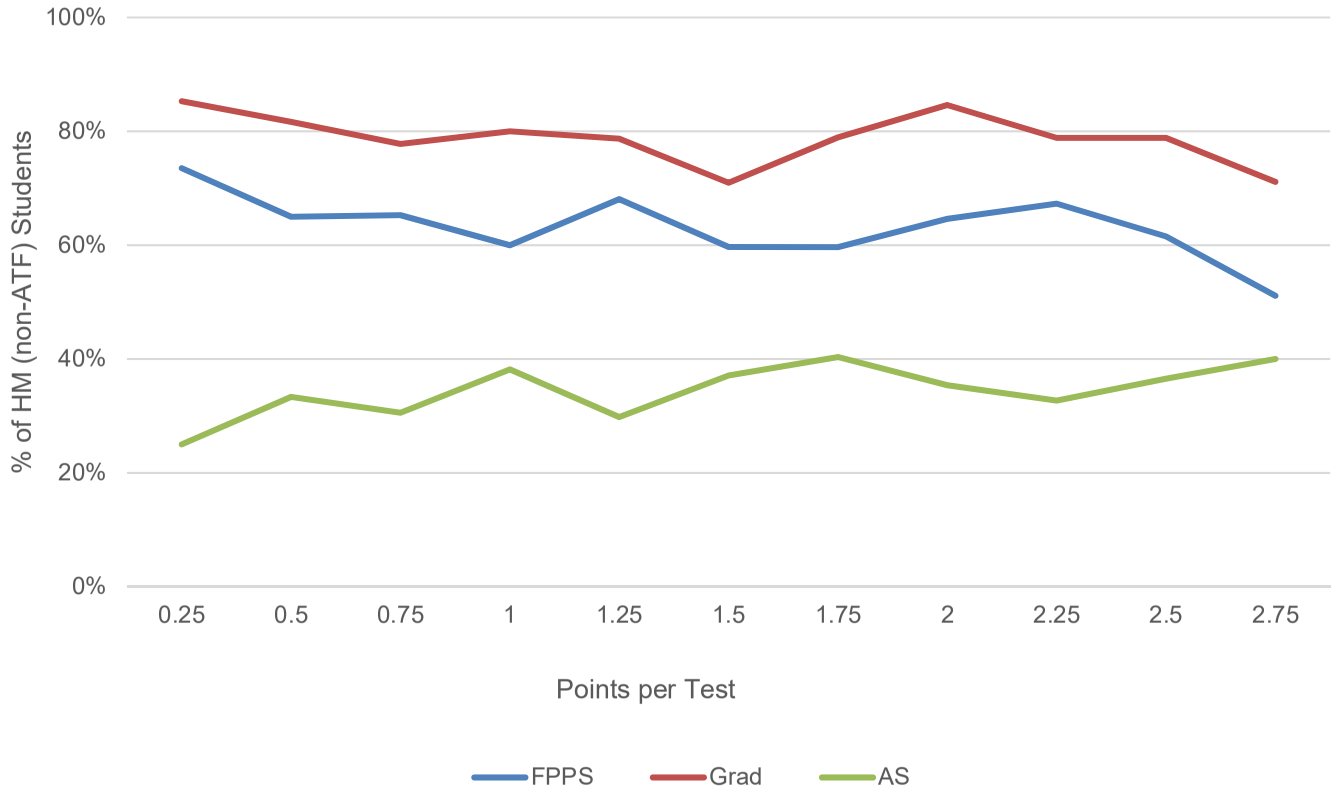
GS+MK+2VE>=208

Or

AR+PC+MK>=156

Waivers

- **The higher the amount of the waiver, the less likely the graduation**
  - However individual difference still has an impact; over 80% of those with 2 points per test successfully graduated



Note: 6 Sailors of 679 had waivers of more than 3 points or more per test.

HM (non-ATF) Recommendation 2 - Potential Reduction of Linescore

- **Implement permanent changes for 6 months before considering linescore reduction**

- **Likely reduce linescore TEMPORARILY by 1 point per test, similar to other medium-complexity ratings**

GS+AR+MK+VE>=204

Or

GS+MK+2VE>=204

Or

AR+PC+MK>=153

				2019-2021 Applicant Population (N=187,368)							
		Qualification Rate		Qualification Rates by AFQT Band (at Lowered Standard)							
Rating/Program	FY23 AC accession goal	Current Standard	Lowered Standard	I	II	IIIA	IIIB	IVA	IVB	IVC	V
				93-99	65-92	50-64	31-49	21-30	16-20	10-15	1-9
HM (AC, non-ATF)	3369	55%	60%	100%	100%	77%	30%	2%	0%	0%	0%

HM (ATF) Findings

HM/ATF

- **HM/ATF encompasses 3 pipelines with differing courses and lengths:**

❖SMT – Search and Rescue Medical Technician (SMT)

- Search and Rescue, MEDEVAC, CASEVAC
- NATOPS qualified
- 4 courses post A-school, approximately 329 days

❖SARC – Fleet Marine Force Reconnaissance Independent Duty Corpsman Role (SARC)

- FMF and SPECOPS IDC
- SPECOPS Advanced Tactical Practitioner
- 9 courses post A-school, approximately 874 days

❖DMT – Medical Deep Sea Diving Technician

- Prevents/treats deep sea diving and high-pressure condition illnesses
- Qualified to dive
- 3 courses post A-school, approximately 344 days

Findings – Additional SMT Courses

- **Little data available since composite implementation to determine SMT pipeline graduation rate, however most graduate from the courses following 19TK**

SMT	Title	Total Student #	Total Graduate #	Waivers	Waiver Grad #
806E	NAVAL AIRCREWMAN CANDIDATE SCHOOL	54	51	2	2
21A8	SMT FLIGHT MEDIC COURSE	35	30	2	1
06T8	SURVIVAL, EVASION, RESISTANCE, AND ESCAPE	31	31	0	0
07VH	SURVIVAL, EVASION, RESISTANCE, AND ESCAPE	8	8	1	1
04Y8	MH-60S SAR MEDICAL TECHNICIAN FLEET REPLACEMENT AIRCREWMAN CATEGORY I	8	8	1	1
04Y5	MH-60S SAR MEDICAL TECHNICIAN FLEET REPLACEMENT AIRCREWMAN CATEGORY I	17	17	0	0

Data with CDP 19TK start date of 11/9/2018 or later, through 10/10/2022.

Findings – Additional SARC Courses

- **Little complete data available since composite change to determine SARC pipeline completion**
- **As with SMT, most graduate the post-19TK courses**

SARC	Title	Total Student #	Graduate #	Waivers	Waiver Grad #
3388	FIELD MEDICAL SERVICE TECHNICIAN	84	82	1	1
11ZP	RECONNAISSANCE TRAINING AND ASSESSMENT PROGRAM	66	51	1	1
04HD	BASIC RECONNAISSANCE TRAINING COMPANY	41	33	1	1
231Z	FLEET MARINE FORCE RECONNAISANCE TECHNICIAN (SOCM)	7	5	0	0
385G	USMC COMBATANT DIVER	22	20	1	1
429R	AMPHIBIOUS RECONNAISSANCE CORPSMAN	26	26	1	1
2007	BASIC AIRBORNE	29	27	1	1
10M0	FLEET MARINE FORCE RECONNAISANCE INDEPENDENT DUTY CORPSMAN	3	3	0	0
21CC	ARMY SERE HIGH RISK (LEVEL C)	4	4	0	0

Data with CDP 19TK start date of 11/9/2018 or later, through 10/10/2022.

Findings – Additional DMT Courses

- **Few have completed DMT pipeline since composite change**
- **Only 2/3 of those who have started 23YH are able to complete it**

DMT	Title	Total Student #	Graduate #	Waivers	Waiver Grad #
23YH	EXPLOSIVE ORDNANCE DISPOSAL AND NAVY DIVER ASSESSMENT AND SELECTION COURSE	12	8	0	0
3365	DIVING MEDICAL TECHNICIAN	20	19	0	0

Data with CDP 19TK start date of 11/9/2018 or later, through 10/10/2022.

Findings – CDP 19TK

- **Initially established as**

  VE+MK+GS>=156 AND AR+WK>=105 AND VE+AR+MK+GS>=210

- **About half graduate, although only 1/3 of the few who receive ASVAB waivers are able to graduate successfully**

CDP 19TK	Student #	% of Sample	Academic Setback Rate	Academic Setback Still in Training	Grad Rate	Academic Failure Rate	Observed FPPS%
Total Sample	404	100.0	.0074	0	.5248	.4752	.5223
Qualified	389	96.3	.0077	0	.5321	.4679	.5296
Waivered	15	3.7	.0000	0	.3333	.6667	.3333

Data with CDP 19TK start date of 11/9/2018 or later, through 10/10/2022.

Findings – CDP 19TK without DOR/PT Failures

- **Initially established as**

  VE+MK+GS>=156 AND AR+WK>=105 AND VE+AR+MK+GS>=210

- **Focus on those with seemingly academic issues, not those who dropped on request or had a PT failure (PT test implemented in FY22)**
- **About 2/3 graduate, implying PT-related issues are not only reason for failure**
  - HM (non-ATF) observed graduation rate 88%

CDP 19TK (without DOR/PT Failures)	Student #	% of Sample	Academic Setback Rate	Academic Setback Still in Training	Grad Rate	Academic Failure Rate	Observed FPPS%
Total Sample	317	100.0	0.0063	0	0.6688	0.3312	0.6656
Qualified	304	95.9	0.0066	0	0.6809	0.3191	0.6776
Waivered	13	4.1	0.0000	0	0.3846	0.6154	0.3846

Data with CDP 19TK start date of 11/9/2018 or later, through 10/10/2022.

HM/ATF - Fully Corrected Validity Coefficients and Diversity

- **Composites with highest validity coefficients (after corrections) listed below for comparison**

Composites	Composite (Family)	Fully Corrected Validity Coefficients n=369 with AO	Standardized Group Mean Score Differences: 12month Accession Population (n=34,595)		
			F-M	AA-W	H-W
GS+MK+VE	SPEC2	0.6321	-.467	-.917	-.609
GS+AR+MK+VE	SPEC4	0.6274	-.493	-.945	-.573
AR+WK	SPEC3	0.5930	-.517	-.899	-.547
MK+VE	ADMIN1	0.6532	-.307	-.716	-.486
AR+MK+MC+VE	TECH1	0.6453	-.558	-1.019	-.582
PC+MK	ADMIN3	0.6407	-.231	-.652	-.424
GS+MK+MC+VE	OPS6	0.6402	-.609	-1.094	-.679
MK+EI+VE	OPS7	0.6377	-.605	-.956	-.633
MK+AS+VE	MECH4	0.6376	-.681	-1.144	-.717
GS+MK+2VE	SPEC6	0.6318	-.470	-.913	-.628
AR+MK+AS+VE	OPS1	0.6316	-.653	-1.116	-.652
AR+MK+EI+VE	OPS5	0.6310	-.596	-.976	-.592
AR+MK+AO+VE	OPS3	0.6284	-.519	-.814	-.312
AR+PC+MK	ADMIN4	0.6282	-.712	-.609	-.365

* Effect Size, or "Cohen's d", are terms used for measurement of group test score differences with .20 considered small, .50 moderate, and .80 large with zero indicating no difference.

HM/ATF Options Under Consideration

Same or better graduation rate, with more accessions

1. **No change at present**
2. **Simplify to just the first composite and add a GS floor of 50**
3. **Combine first composite with AR+MK+MC+VE as alternate**
4. **Make same new alternative composites as HM since course is the same**

Predicted HM/ATF FPPS with Individual Composites

- Possible scores and impact on FPPS and Qualification Rate (QR) listed below

Cutscore Analysis for Predicted FPPS "at or above" Key Scores Applied to 12month Navy Accessions N=34,595

Transformed Score	GS+MK+VE (Current Eq. 1)				AR+MK+MC+VE (Eq. 2 Option 3)				GS+AR+MK+VE (Eq. 1 Option 4)				PC+AR+MK (Eq. 3 Option 4)			
	Score	Pred. FPPS	Pred. Grad	QR	Score	Pred. FPPS	Pred. Grad	QR	Score	Pred. FPPS	Pred. Grad	QR	Score	Pred. FPPS	Pred. Grad	QR
221	166	56.7	56.9	36.1	221	58.0	58.3	34.4	221	57.0	57.2	35.6	166	57.6	57.9	37.0
218	164	55.4	55.6	39.9	218	56.3	56.6	38.5	218	55.5	55.8	39.7	164	56.3	56.6	40.8
215	161	53.4	53.7	46.0	215	54.6	54.9	43.0	215	54.0	54.3	44.0	161	54.4	54.7	46.7
212	159	52.2	52.4	50.3	212	53.0	53.2	47.5	212	52.6	52.9	48.7	159	53.1	53.4	50.8
209	157	50.9	51.2	54.6	209	51.4	51.6	52.2	209	51.1	51.4	53.5	157	51.9	52.2	55.0
206	154	49.2	49.5	61.1	206	49.8	50.1	57.0	206	49.4	49.7	59.8	154	50.0	50.3	61.8
203	152	48.0	48.3	65.6	203	48.3	48.6	61.9	203	48.5	48.8	62.9	152	48.8	49.0	66.4
200	150	47.0	47.3	69.8	200	46.9	47.1	66.9	200	47.2	47.5	67.7	150	47.6	47.9	70.9
197	148	45.9	46.3	74.1	197	45.5	45.7	71.7	197	46.0	46.3	72.4	148	46.4	46.7	75.7

Notes.
1. Tests transformed to be equivalent to a 4-test score.
2. 12-month Navy accessions 10/11/2021 – 10/10/2022.

Summary of Full Options - HM/ATF

- **Simplifying by using alternatives (OR) and utilizing the new HM composites/scores maintains predicted graduation rate while opening the program to almost 2,000 additional accessions**

	Qualification Standard			
	VE+MK+GS>=156 AND AR+WK>=105 AND VE+AR+MK+GS>=210	VE+MK+GS>=215 AND GS>=50	VE+MK+GS>=163 OR AR+MK+MC+VE>=217	GS+AR+MK+VE>=218 OR GS+MK+2VE>=218 OR AR+PC+MK>=164
	[Current]	[Option 2]	[Option 3]	[Option 4]
QR	44.0%	44.6%	47.3%	49.2%
Diff from Current #	---	+187	+1130	+1785
%Qualified F::M	.583	.583	.594	.676
%Qualified AA::W	.383	.391	.392	.444
%Qualified H::W	.600	.585	.614	.656
Predicted Grad	54.0%	54.0%	54.5%	54.5%
Predicted FPPS	53.7%	53.8%	54.2%	54.2%

*12-month Navy accessions 10/11/2021 – 10/10/2022.

HM/ATF Recommendation

- **Issue memo for PERMANENT change of standards to adopt:**

GS+AR+MK+VE>=218
OR
GS+MK+2VE>=218
OR
AR+PC+MK>=164

Backup

ASVAB Tests and Special Classification Tests

Test	Content
General Science (GS)	Biological and physical sciences
Arithmetic Reasoning (AR)	Arithmetic word problems
Word Knowledge (WK)	Synonyms/meaning of words in context
Paragraph Comprehension (PC)	Written passages
Mathematics Knowledge (MK)	Algebra, geometry, fractions, decimals, exponents
Electronic Information (EI)	Electrical principles and electronics
Auto and Shop Information (AS)	Automotive, tool, shop, practices
Mechanical Comprehension (MC)	Mechanical and physical principles
Assembling Objects (AO)	Patterns and connection point recognition
Verbal (VE)	Combination of 1/3 PC and 2/3 WK
Coding Speed (CS)	Perceptual speed and accuracy test; not administered to all candidates
Defense Language Aptitude Battery (DLAB)	Administered to CTI candidates
Navy Advanced Placement Test (NAPT)	Administered to about 1/2 of NF candidates
Cyber Test (CT)	Used for some computer intensive ratings
Mental Counters (MCt)	Working memory test