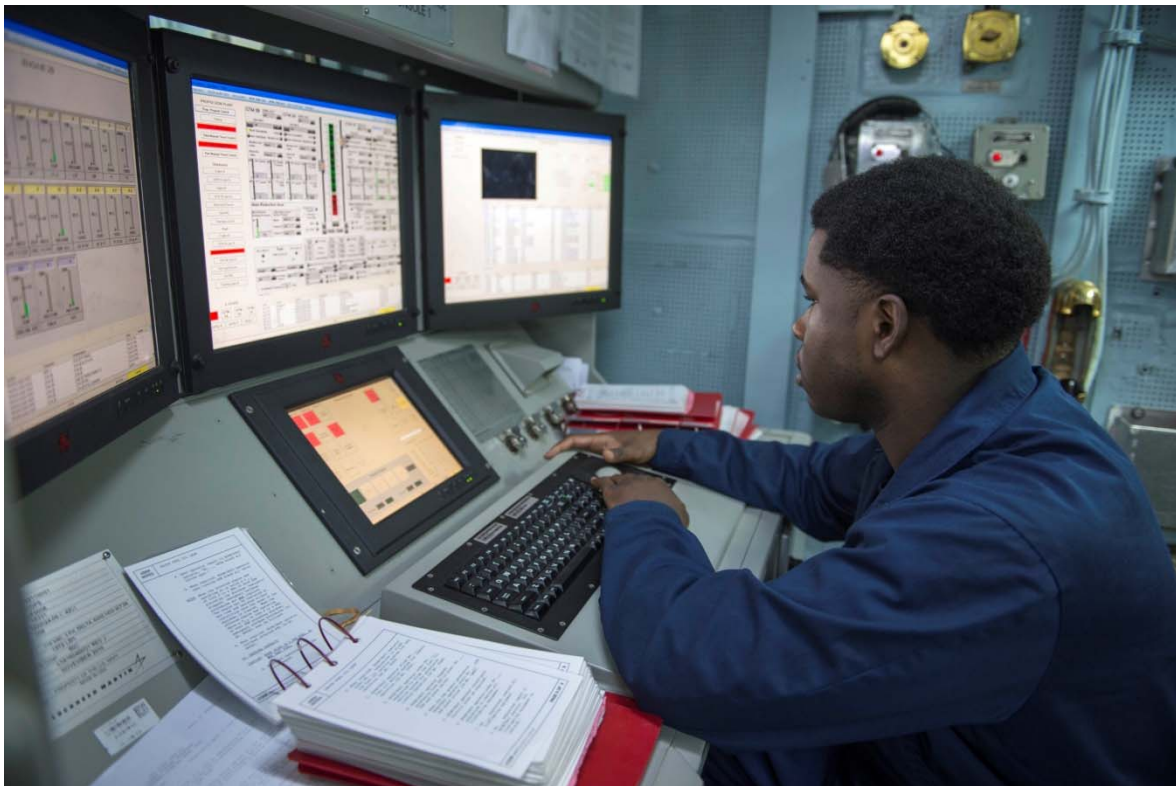


Enlisted Career Paths for Top Snipes and Combat Systems Maintenance Managers

Warren T. Sutton • Yevgeniya K. Pinelis
with
David L. Reese

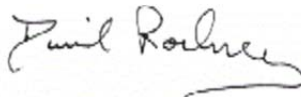


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Photo credit line: Gas Turbine Systems Technician (Mechanical) 2nd Class Quazavier Henderson monitors the engineering systems during a basic engineering casualty control exercise in the central control station of Arleigh Burke-class guided-missile destroyer USS *Stout* (DDG 55). *Stout* is on a scheduled deployment supporting maritime security operations and theater security cooperation efforts in the U.S. 6th Fleet area of responsibility. (U.S. Navy photo (140205-N-UD469-022, Mediterranean Sea, Feb. 5, 2014) by Mass Communication Specialist 2nd Class Amanda R. Gray/Released)

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Executive summary

The Surface Navy has decided to implement a new optimal career path that will ensure that select sailors receive rating-enriching work on both sea and shore tours. This new career path is designed to allow sailors to hone their skills on a particular platform (in some cases, the baseline of the Aegis weapon system) to become technical experts as they advance to senior sailors in the fleet. The Navy's goal is to increase the proficiency of Combat Systems Maintenance Managers (CSMMs) and Top Snipes (the senior enlisted person on board in the rating) serving in the fleet with this new optimal career path. Initially, the optimal career path will be piloted in the Engineman, Machinist Mate, Fire Controlman–Aegis, and Gas Turbine Systems Technician for Electrical and Mechanical (GSE/GSM/GS) communities.

In this study, we examine whether the sailors currently serving as CSMMs/Top Snipes have career paths that mirror the newly defined optimal career path. We also give guidance on the number of sailors to tag as potential future CSMMs/Top Snipes, as the Navy implements a new program that gives sailors tracking Navy Enlisted Classifications (NECs). Lastly, we determine how the current CSMMs/Top Snipes perform on the occupation component of their E5 advancement exam relative to their peers who took the exam at the same time. This analysis aims to understand if this metric could be used to help identify potential future CSMMs/Top Snipes.

The results of our study show that the majority of current CSMMs/Top Snipes follow the optimal career path, although very few actually have all of their sea tours on the same platform. These sailors are also top performers compared with their peers who took the E5 advancement exam at the same time. This suggests that, for all the communities in our study, except the GSE/GSM/GS community, high achievement on the E5 advancement exam is a good indicator of potential to become a CSMM/Top Snipe. The E8 selection board appeared to be a better indicator for the GSE/GSM/GS community.

Using inverse survival analysis, we are able to determine the numbers of sailors to tag with the tracking NEC in each cohort to ensure that

all future CSMM/Top Snipe billets are filled. We also conclude that there are enough rating-enriching shore billets to have opportunities for all sailors that the Navy would like to tag.

Introduction

Background

The Navy consistently strives to achieve the goal of providing highly trained and qualified sailors to the fleet to fulfill missions. Often these sailors are expected to possess critical technical skills in numerous positions and expertise to mentor junior sailors. Commander, Naval Surface Forces (COMNAVSURFOR), recently noted proficiency problems with sailors in senior positions at sea. This observation led to a message that set development and career management of sailors as a top priority [1]. The proposed solution is to create a career path that gives sailors meaningful experience at sea, reinforced by knowledge-enriching shore tours—a clear statement that simply earning an NEC through a training course is not adequate to be proficient at these key senior positions at sea. A new standard relies on giving sailors experience throughout their careers to prepare them for these key senior positions at sea. The Navy remains confident in the capabilities of the sailors selected for these key senior positions at sea. At the heart of the proficiency issue is lack of opportunities through consistent experience, not competency of sailors.

COMNAVSURFOR asked for NI support in developing *knowledge-enriching* career paths for senior enlisted personnel at sea. Two working groups were formed. One focused on the career path from Fire Controlman–Aegis (FC-Aegis) to Aegis Combat Systems Maintenance Manager (CSMM). The other group examined career paths for several engineering ratings—Engineman (EN), Machinist Mate (MM), and Gas Turbine Systems Technician for Electrical and Mechanical (GSE/GSM/GS)¹—up to Top Snipe, the senior enlisted person on board in the rating. The effort of these working groups led to an understanding of the foundation of the CSMM/Top Snipe professional development process and to an opportunity for CNA to support.

1. The Gas Turbine Systems Technician group is a combination of three related communities, which we treat as one for the purposes of this study.

Tasking

The Navy Personnel Command (NPC) asked CNA to investigate how career paths for Surface Navy sailors can be improved to better support fleet manning goals and increase the technical and tactical abilities of senior enlisted sailors at sea. Our tasks focus on understanding the career paths of sailors currently serving as CSMMs/Top Snipes. This requires the ability to track sailors' tours as they rotate from sea to shore and vice versa. This task is made possible through the use of CNA's extensive personnel files that keep historical information of various sailor characteristics, including prior tours. These data allow us to identify the career paths of sailors currently serving as CSMMs/Top Snipes and to decide if they are in accordance with the newly proposed optimal career paths.

In conjunction with our research, NPC's Enlisted Detailing Division (PERS-40) has developed a plan to identify potential future CSMMs/Top Snipes. It allows the Navy to tag these sailors with a tracking NEC, which allows them to be easily identified when being considered for detailing. The action of PERS-40 is also intended to make sure that the sailors identified get jobs that are on the optimal career path. In this study, we provide support for this effort by helping PERS-40 understand the number of sailors who should be tagged from each cohort to fulfill the CSMM/Top Snipe billet requirements. We also check to see if there are sufficient technically enriching petty officer shore billets for the tagged sailors to rotate to during their first shore tour.

This study attempts to answer three key research questions.

1. What are the career paths of sailors who are currently serving as CSMMs/Top Snipes?
2. Does the current billet base support the implementation of an optimal career path?
3. How can potential CSMM/Top Snipe candidates be identified?

In the following sections, we present a methodology and results for answering each of these questions.

The optimal career path plan

COMNAVSURFOR noticed that there was an issue with CSMM/Top Snipe sailors performing their duties with the expected level of technical skill. This qualitative assessment led to ideas on how to increase the technical abilities of CSMMs/Top Snipes. There is notional evidence that sailors who do not get the opportunity to perform in-rate work in shore tours have lower technical abilities because of skill atrophy. The optimal career path was developed to address this issue. The optimal career path would create a sequence of sea and shore jobs that focus on in-rate technical work so that sailors maintain high technical abilities throughout their career leading to CSMM/Top Snipe positions.

Definition of “optimal career path”

The term *optimal career path*² implies that it is the best career path to select. Many sailors in the enlisted management communities (EMCs) that we are examining, however, take other career paths that lead to successful Navy careers. For example, some sailors take a sequence of jobs that accentuate their leadership abilities. This can often lead to a very successful Navy career as a Command Master Chief. But, for the purpose of this study, those types of roles are not considered to be on the optimal career path.

A more precise definition of the term is a sequence of jobs that enhance a sailor’s technical ability to perform the work specific to his or her rating. Thus, the optimal career path focuses primarily on getting a sailor to become a technical expert by the time he or she becomes a CSMM/Top Snipe. To achieve the standard of the optimal career path, technical sea tours are followed by technical, knowledge-enriching shore tours. This step is critical to maintaining the technical skill set on the optimal career path.

2. The terms *optimal career path* and *ideal career path* are synonymous.

A further consideration on the optimal career path is that the sea tours for the sailor should be on the same platform because engineering and weapon systems vary widely across the Surface Navy. For the Aegis weapon system, there is a further concern about variation within platforms across baselines (i.e., versions of the Aegis missile system). A sailor who has a tour on a destroyer with Aegis baseline 7 may not be as adept on a destroyer with Aegis baseline 9. So, for CSMMs, consistent experience on the same platform and baseline is valued.³

Being on the optimal career path promises technically enriching sea and shore tours; it does not guarantee that sailor proficiency will improve. There is a possibility that sailors will participate in all the correct tours along the optimal career path and still be unable to perform the duties of CSMM/Top Snipe at the desired level of proficiency. There is a possibility of atrophy of sailor skills over time, in spite of remaining on the optimal career path, or insufficient training to perform the duties of CSMM/Top Snipe. These types of potential issues will not be addressed in this study.

What is the optimal career path?

Originally, our first goal in this study was to identify the optimal career path for all the EMCs identified. Documents exist that are used as guidance for community managers and detailers on the types of jobs/duties that should be performed in each rotation [2], but they are not constructed with the strict technical knowledge of the optimal career path. Ultimately, we decided to use the career paths suggested by the Surface Warfare Enterprise (SWE) working group in conjunction with the SWE Personnel Readiness Team (PRT).

Table 1 lists the jobs and qualifications on the optimal career path for a Top Snipe. Note that the list of qualifications in table 1 is only a partial list of qualifications expected of all sailors in the EMC. Additional qualifications are required of all sailors who are making due progress in their Navy careers. Our list specifically calls out the essential requirements of the Top Snipe optimal career path.

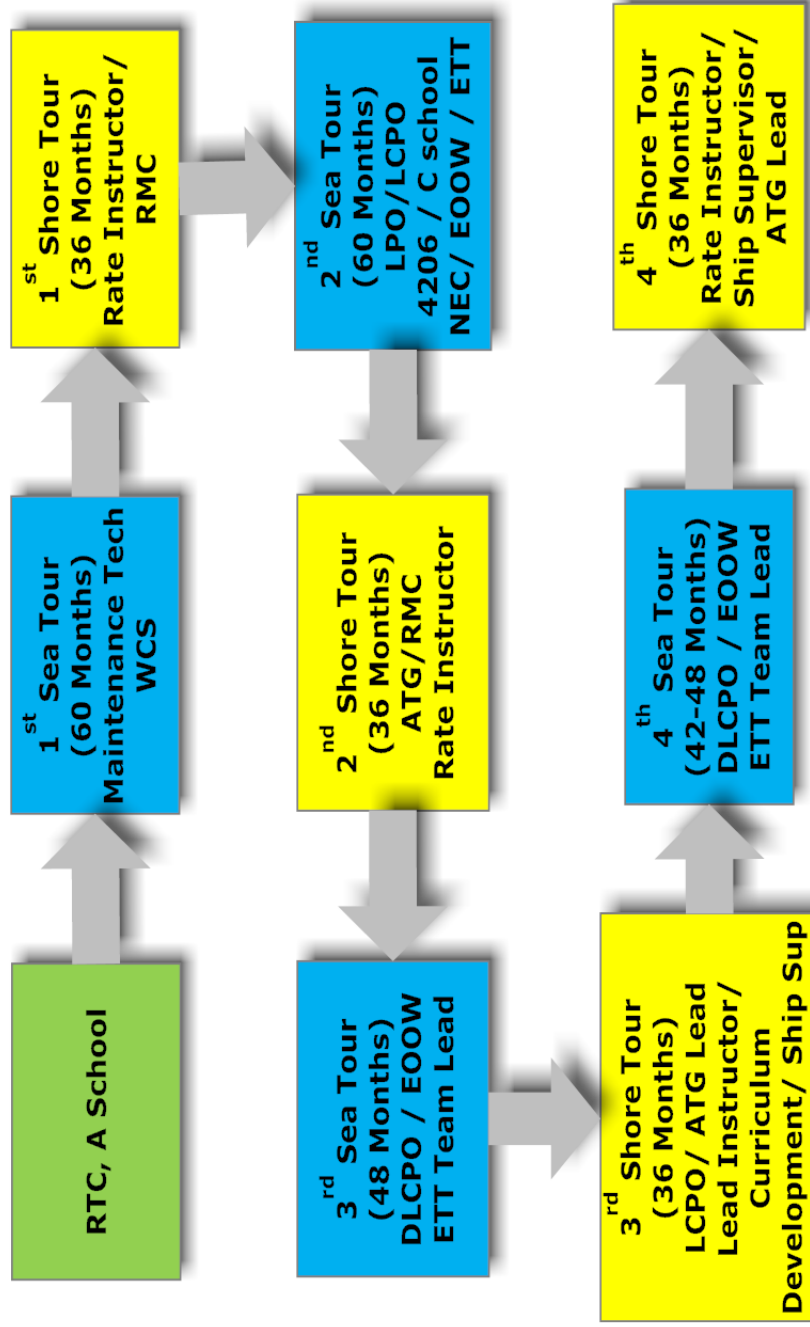
3. We were not able to include consideration for baseline in this study, but this point is important to note for understanding the complexity of following the optimal career path.

Table 1. Jobs on optimal career path to Top Snipe

Tour	Jobs	Qualifications
1 st sea tour	Maintenance Technician	Work Center Supervisor (WCS)
1 st shore tour	In-Rate Instructor or Regional Maintenance Center (RMC)	
2 nd sea tour	Leading Petty Officer (LPO) or Leading Chief Petty Officer (LCPO)	Shipboard Engineering Plant Program Manager (NEC 4206), Engineering Officer of the Watch (EOOW), and Engineering Training Team (ETT)
2 nd shore tour	Afloat Training Group (ATG), RMC, or In-Rate Instructor	
3 rd sea tour	Departmental Leading Chief Petty Officer (DLCPO)	EOOW and ETT
3 rd shore tour	LCPO Ashore, ATG Lead, Lead Instructor, Curriculum Development, or Ship Supervisor	
4 th sea tour	DLCPO	EOOW and ETT
4 th shore tour	In-Rate Instructor, Ship Supervisor, or ATG Lead	

Figure 1 displays the optimal career path for engineering EMCs that lead to Top Snipe. Each box in the figure represents a tour, with blue boxes representing sea tours and yellow boxes representing shore tours. Figure 1 starts with a green box that represents the training that each sailor completes before serving in the fleet. This box calls out Recruit Training Command (RTC) and A-school, but often sailors in the EMCs of interest also complete C-school. Arrows are used to connect the subsequent boxes, showing the sequential steps of the optimal career path. The prescribed tour length is also included in each box. In each tour, there are several jobs and/or qualifications that are part of the optimal career path. A sailor on the optimal career path would be expected to complete one of the jobs and all of the qualifications. As an exception to this statement, in some cases, qualifications are repeated on several tours. This indicates that there are multiple opportunities to get qualified.

Figure 1. Optimal career path for Top Snipe

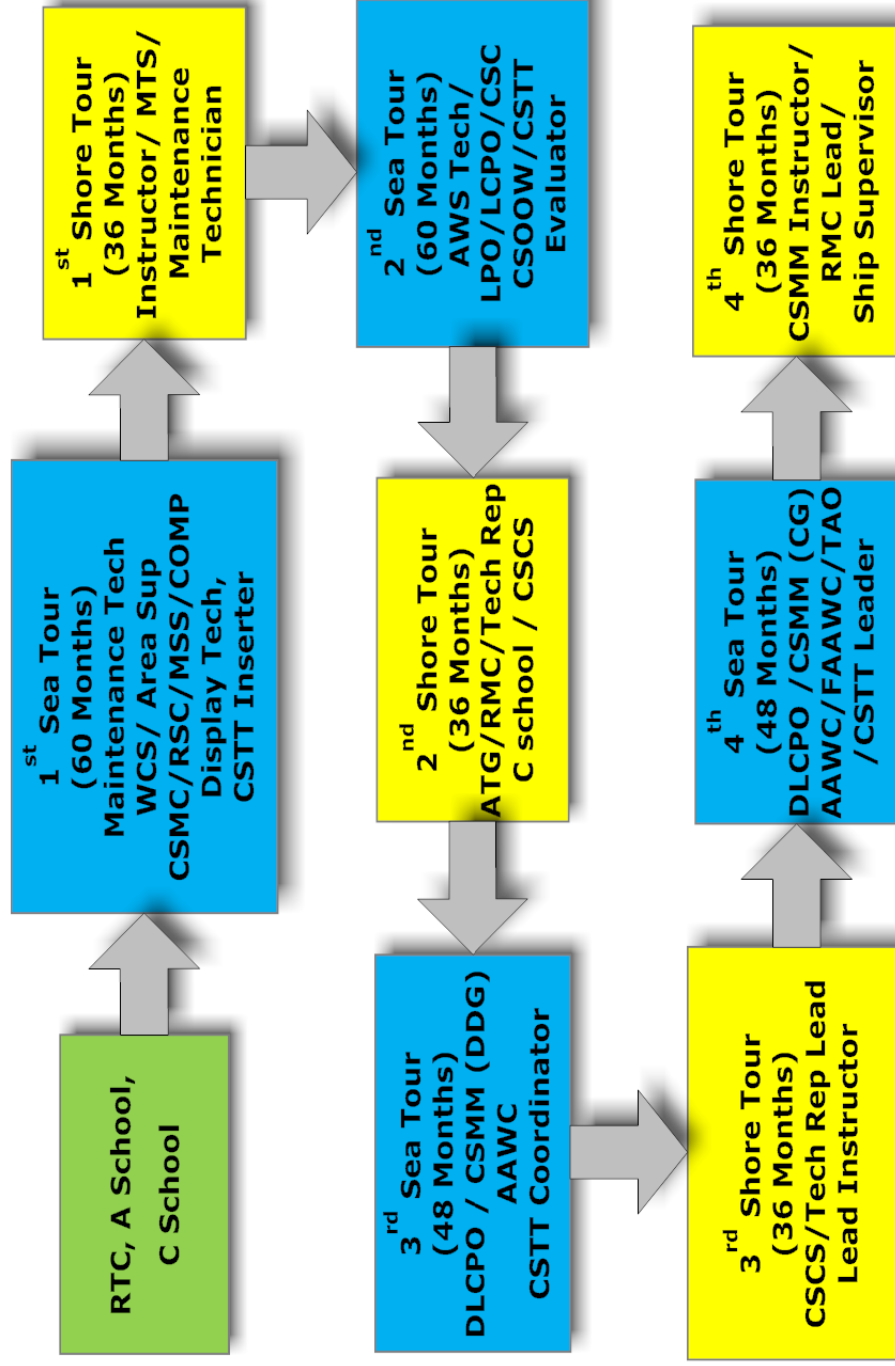


Similar to the optimal career path to Top Snipe, an optimal career path leading to CSMM was also developed by the SWE working group and SWE PRT. The specific jobs and qualifications for the CSMM optimal career path are included in table 2. The optimal career path for CSMM is displayed in figure 2, which is formatted similarly to figure 1.

Table 2. Jobs on optimal career path to CSMM

Tour	Jobs	Qualifications
1 st sea tour	Maintenance Technician	Work Center Supervisor (WCS), Area Supervisor, Combat System Maintenance Central (CSMC), Radar System Controller (RSC), Missile System Supervisor (MSS), Computer/ Display Technician, and Combat Systems Training Team (CSTT) Inserter
1 st shore tour	In-Rate Instructor or Maintenance Technician	Master Training Specialist (MTS)
2 nd sea tour	Aegis Weapon System Supervisor (AWS) Technician, Leading Petty Officer (LPO), or Leading Chief Petty Officer (LCPO)	Combat System Coordinator (CSC), Combat System Officer of the Watch (CSOOW), and Combat Systems Training Team (CSTT) Evaluator
2 nd shore tour	Afloat Training Group (ATG), Regional Maintenance Center (RMC), Technical Representative to Center for Surface Combat Systems (CSCS), or C-school Instructor	
3 rd sea tour	Departmental Leading Chief Petty Officer (DLCPO) or CSMM on Destroyer	Anti-Air Warfare Coordinator (AAWC) and Combat Systems Training Team (CSTT) Coordinator
3 rd shore tour	Center for Surface Combat Systems (CSCS), Technical Representative Lead, or Lead Instructor	
4 th sea tour	Departmental Leading Chief Petty Officer (DLCPO) or CSMM on Cruiser	Anti-Air Warfare Coordinator (AAWC), Force AAWC, Tactical Action Officer (TAO), and Combat Systems Training Team (CSTT) Leader
4 th shore tour	CSMM Instructor, Regional Maintenance Center (RMC) Lead, or Ship Supervisor	

Figure 2. Optimal career path for CSMM



What makes the optimal career path different?

Because there are multiple jobs in most tours and several opportunities to get qualified for certain skills, the optimal career path is not overly restrictive for sailors. Thus, many sailors who are progressing on due course in their careers should have an opportunity to fulfill all of the requirements of the optimal career path. The most notable difference between the optimal career path and the expected career progress of a typical sailor is the emphasis on in-rate shore experience on the optimal career path. This is to be expected because the optimal career path is designed to guarantee technical, knowledge-enriching experience in every shore tour.

The locations of the technical in-rate shore positions for the career path to Top Snipe and CSMM are provided in table 3 and table 4, respectively. Each location is identified by its five-character alpha numeric unit identification code (UIC). This information is followed by the name of the location. For some UICs, only certain positions qualify for technical in-rate shore duty. In such cases, the name of the UIC is supplemented with the qualifying position.

The focus on technical shore experience is of great benefit to developing sailors who are technical specialists, but this comes at the expense of giving sailors the experiences that make them great leaders in the Navy. These skills are usually gained through tours that give sailors the holistic view of the Navy and its greater mission outside any individual community. Thus, shore tours as a community manager, detailer, or recruiter are not included in the optimal career path, though they could lead to very successful Navy careers.

Table 3. Location of technical in-rate shore positions for Top Snipe optimal career path

UIC	Command and/or position name
30734	ATG Mayport
32353	ATG Middle Pacific
30733	ATG Norfolk
31379	ATG Pacific Northwest
49365	ATG San Diego
57064	ATG Western Pacific
49366	ATG Western Pacific (Detachment (DET) Sasebo)
49769	Ship Intermediate Maintenance Facility Pacific Northwest
53934	Naval Surface Force Atlantic LHA LHD LPD Readiness & Material Supply
68438	Naval Intermediate Maintenance Facility Pacific Northwest
42158	Norfolk Naval Shipyard
3812A	Norfolk Ship Support Activity Submarine Fleet Maintenance Activity
50054	Norfolk Ship Support Activity
41150	Norfolk Ship Support Activity Surface Fleet Maintenance Activity
52063	Pearl Harbor Naval Shipyard
48915	RMC Mid-Atlantic (DET Bahrain)
67562	RMC Mid-Atlantic (DET Naples)
50094	RMC Mid-Atlantic (DET Norfolk Naval Shipyard)
4002A	RMC Southeast
55236	RMC Southwest
45598	Ship Repair Facility (SRF) DET Sasebo
62758	SRF Yokosuka
62786	Supervisor of Shipbuilding Conversion and Repair Bath
69316	Supervisor of Shipbuilding Conversion and Repair Gulf Coast
42169	Surface Warfare Officers School (SWOS) Engineering Coronado
61094	SWOS Engineering Mayport
43884	SWOS Engineering Norfolk
3128B	SWOS Engineering Yokosuka
41442	SWOS Foreign Military Sales Great Lakes
41918	SWOS Foreign Military Sales Newport
3203A	SWOS Great Lakes
63160	SWOS Newport
34758	SWOS Norfolk
3202A	SWOS Pearl Harbor
41820	SWOS San Diego
43848	SWOS Learning Site Norfolk
3475B	SWOS Support Site Norfolk
63190	SWOS Command Newport

Table 3. Location of technical in-rate shore positions for Top Snipe optimal career path

UIC	Command and/or position name
4150A	Southwest RMC Submarine Maintenance Division

Table 4. Location of technical in-rate shore positions for CSMM optimal career path

UIC	Command and/or position name
39029	Aegis Technical Representative
30734	ATG Mayport
57063	ATG Middle Pacific
30733	ATG Norfolk
49365	ATG San Diego
57064	ATG Western Pacific
45539	Aegis Training and Readiness Center Dahlgren
63273	Combat Direction Systems Activity Dam Neck
31977	Commander Operational Test & Evaluation Force
43888	CSCS DET Dam Neck
43900	CSCS DET Great Lakes
45952	CSCS DET Norfolk
45540	CSCS DET Pearl Harbor
69189	CSCS DET San Diego
45534	CSCS DET Wallops
49017	CSCS DET Yokosuka
00124	Navy War College (Ballistic Missile Defense in war game cell)
49769	Naval Intermediate Maintenance Facility Everett
50094	Norfolk Naval Shipyard Fleet Maintenance Technical – Technical Representative
00178	Naval Surface Warfare Center (NSWC) Dahlgren Division
61762	NSWC Detachment White Sands, New Mexico
63394	NSWC Port Hueneme
32253	Pearl Harbor Naval Shipyard and Intermediate Maintenance Facility
0534A	Pacific Missile Range Facility
55271	Regional Support Organization Pacific Northwest
4002A	Southeast RMC Technical Representative
62758	SRF Yokosuka
40640	Strategic Command Ballistic Missile Defense
63190	SWOS Command Newport
55236	Southwest RMC
53996	Tactical Training Group Pacific
40434	Tactical Training Group Pacific DET Honshu

Potential issues with the optimal career path plan

No guarantee of high proficiency

The Navy's claim that following the optimal career path leads to more proficiency as a CSMM/Top Snipe may not be true. It presupposes that a sailor's experience leading up to the CSMM/Top Snipe tour is insufficient for the sailor to perform at the expected level. This makes the assertion that consistent experience will produce higher proficiency. While this may be true in many settings, there is a clear substitution of experience as a proxy for proficiency. Yet, it is possible that other factors could be influencing a sailor's performance as CSMM/Top Snipe. Among those factors is the lack of proper training to perform the required work and the impact of undermanning of support staff, which leads to an increased workload for all sailors, especially supervisory sailors who carry the additional mentoring burden. These types of factors are not included as part of this study, but they could be unexplained factors that prevent the Navy from achieving the desired performance levels from CSMMs/Top Snipes.

Bifurcation of communities

As the Navy moves to the use of the optimal career path, there is a natural tension between having a community that consists of specialists versus one that has generalists. The specialists are the sailors who are technical experts in the work of their rating but may lack the bigger picture of the Navy's mission. In contrast, the generalists are the sailors who take advantage of command leadership opportunities, sometimes at the expense of greater technical expertise. With the implementation of the optimal career path for select sailors, there is potential for bifurcation of many technical Navy EMCs into specialist and generalist.

This tension between being a generalist versus a specialist is something that the Navy must constantly address. In recent years, the pendulum has swung in the direction of being more generalist, with the need for individual augmentees and additional joint service opportunities. By initiating the optimal career path, the Navy, primarily through SURFOR, is making a statement that having a specialized and focused skill set is of great value to the Navy. Moreover, there is a

cost to fleet personnel readiness that is paid by not having sufficient quantities of proficient specialists.

One particular shore tour of the generalist career path that comes under scrutiny is sailors serving in recruiting duty. While the Navy as a whole greatly values the ability of sailors to recruit and train the next cohort of sailors, it is widely understood that this takes sailors away from doing what they entered the Navy to do—their in-rate jobs. Thus, the supply of recruiters is seen as a tax that the community has to pay to do business. But in times when manning levels are under desired targets, there is less of a willingness to pay this tax.

The Navy must be conscious decision-makers to have these target communities support two career paths that may appear very different at times. At some point, the decision to implement a specialist career path may lead to advertising the positions in the community along a generalist or specialist career path—or even a splitting of the communities based on the differences in the career path. So, as the Navy moves forward with the optimal career path, it should understand that this path is likely to lead to bifurcation of these communities into specialist and generalist.

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Data composition and considerations

In this study, we use the CNA archives of the enlisted master file (EMF), which contains enlisted personnel records as far back as the late 1970s. These data allow us to reconstruct the careers of sailors from the time they entered the active force to the present. At each point in time, we are able to gather various pieces of information about them, including rank, current duty station, NECs held, and Distributable NECs (DNECs), which describe the work that a sailor is sent to a unit to perform. With this information, we can determine where sailors served during their careers, how long they served, and what jobs they did. The current duty station allows us to determine the ship or shore command to which a sailor is attached. The DNEC tells us the job that the sailor was sent to the command to perform. Early in their careers, sailors are frequently given orders that do not include DNECs. We consider all sailors who serve in the fleet on their initial tours to be performing in-rate work because we do not have any DNEC information on these sailors.⁴

For this study, we are interested in sailors who have been detailed with DNEC 1104 (Aegis Combat System Maintenance Supervisor) and 4206 (Shipboard Engineering Plant Program Manager), which are NECs for CSMM and Top Snipe, respectively. The sailors in the FC-Aegis community use the 1104 DNEC as CSMMs, while the EN, GSE/GSM/GS, and MM use the 4206 DNEC as Top Snipes. Using these NECs, we are able to search the September 2013 EMF for any sailors who have DNEC 1104 or 4206. This results in 497 total sailors distributed in the EMCs, as given in table 5. This set of sailors is a superset of the actual number of sailors who are serving as CSMMs/Top Snipes in the fleet. This anomaly occurs because NEC 4206 can appear multiple times in shipboard requirements within a rating. So, the only way to know that a particular person is serving as Top Snipe

4. This assumption follows the Navy's practice that does not attach NEC requirements to many of the junior billets, which sailors would fill on their initial sea tours.

is to have direct communication with the command/ship. Since we are reconstructing the career paths of these sailors from historical records, it is not possible to confirm the identities of those serving as Top Snipes at past points in time. For the purpose of this study, we do not try to determine which sailor is actually serving as Top Snipe; instead, we consider all sailors who have DNEC 4206 to be serving as Top Snipes. This is not a limiting assumption because the other sailors who have DNEC 4206 are senior sailors who would have career paths similar to that of the Top Snipe.

Table 5. Count of CSMMs/ Top Snipes

EMC	Count
EN	112
GSE/GSM/GS	192
MM	82
FC-AEGIS	111
Total	497

For each sailor in the study, we have a record that gives the date, duty station, and DNECs that the sailor has at the time. This structure provides one record per tour for every sailor and allows us to reconstruct where and when a sailor has served throughout his or her career. An example of a sailor’s career profile is given in table 6.

Table 6. Notional sailor career path

Date	Activity	Tour	DNEC(s)
Dec. 1999	CG 53 <i>Mobile Bay</i>	1 st sea tour	0000 – No NEC assigned
Mar. 2004	RTC Great Lakes	1 st shore tour	9508 - Recruit/Assistant Recruit Company Commander/Recruit Instructor
Sep. 2007	FFG 51 <i>Gary</i>	2 nd sea tour	4382 - FFG-7 Class Auxiliaries Mechanical System Technician
Oct. 2010	ATG San Diego	2 nd shore tour	9502 - Instructor
Sep. 2013	DDG 94 <i>Nitze</i>	3 rd sea tour	4206 - Shipboard Engineering Plant Program Manager

For the sailor career depicted in table 6, we see that the sailor started with a sea tour on USS *Mobile Bay* (CG 53) a guided-missile cruiser. On this tour, the sailor was not assigned a DNEC, so we would surmise that the sailor performed general in-rate work. On the first shore tour, the sailor serves at the Recruit Training Command (RTC) in Great Lakes as a recruit instructor or assistant recruit company commander. On the second sea tour, the sailor serves on USS *Gary* (FFG 51), an Oliver Hazard Perry-class frigate, as an auxiliaries mechanical system technician. On the second shore tour, the sailor serves as an instructor at the afloat training group (ATG) in San Diego. And on the third sea tour, the sailor serves as the Top Snipe on USS *Nitze* (DDG 94), an Arleigh Burke-class destroyer.

Using records similar in style to those in table 6, we construct the career path for all 497 of our CSMMs/Top Snipes. We also use the information from the activity and the DNECs to determine whether each job the sailor has is on the optimal career path.⁵ When any of a sailor's jobs is considered not on the optimal career path, that sailor's entire career is considered off the optimal career path. As mentioned in the previous section, being on the optimal career path implies having a particular job and a set of qualifications. In our procedure, we are unable to track the qualifications that a sailor receives over his or her career, due to a limitation in available data, so we are limited to tracking the jobs of the sailor.

In addition to reconstructing the career path of sailors, we also need to understand the billet requirements for CSMMs/Top Snipes. This information is provided from an April 12, 2013, snapshot of the Navy Manpower Program and Budget System (NMPBS) (see table 7). This date was selected because it is consistent with the data used by the SWE working group.

5. The description of the NECs is found in the Navy Enlisted Manpower and Personnel Classifications and Occupational Standards, Volume II [3].

Table 7. CSMM/Top Snipe billet requirements

	E7	E8	E9	Total
EN	29	3	22	54
GSE/GSM/GS	15	88	-	103
MM	-	-	10	10
FC-Aegis	-	62	22	84

We were also able to use the SWE working group’s data on enriching shore duty billets from the same extract. The enriching shore positions for the CSMM optimal career path include billets at the following commands: Aegis Training and Readiness Center, Center for Combat Systems, ATGs, and U.S. Naval Ship Repair Facility Yokosuka. The enriching shore positions for the Top Snipe optimal career path include billets at ATGs and regional maintenance centers, as well as A-school/C-school instructor billets.

Results

Do current CSMMs/Top Snipes follow optimal career paths?

With the optimal career paths established, we would like to understand how different the career paths of current CSMMs/Top Snipes are from the optimal career path. Particularly, we are interested in how many current CSMMs/Top Snipes followed the optimal career path before it was introduced as official policy. This would allow Navy leadership to understand the extent to which the optimal career path will help to enhance the skills of sailors who are going to become CSMMs/Top Snipes. If the results indicate that a small percentage of the current CSMMs/Top Snipes have followed the optimal career path, there are obvious gains to be expected as new CSMMs/Top Snipes are trained through the ranks. However, if the large majority of current CSMMs/Top Snipes have followed the optimal career path, the gains of creating this focused career path may not have the desired effects, and there may be another problem occurring.

We examine the career paths of the CSMMs/Top Snipes EMC by EMC, starting with EN in table 8. In the EN community, 77 percent of the current Top Snipes have had all their tours follow the ideal career path; only 23 percent had at least one tour off the ideal path. Digging a bit deeper, 6 percent of the EN Top Snipes had at least two tours not on the ideal career path. This shows that the majority of the current EN Top Snipes have followed the ideal career path. Furthermore, when the EN Top Snipes do not follow the ideal career path, they typically have at most one tour off the ideal path.

Table 8. Career paths of EN Top Snipes

	Count	Percentage
All tours from ideal path	86	77%
At least 1 tour not on ideal path	26	23%
→ At least 2 tours not on ideal path	7	6%

Analysis of the MM, GSE/GSM/GS, and FC-Aegis communities shows similar results to a slightly lesser degree (see Table 9). Each of these EMCs has 61 to 65 percent of their CSMM/Top Snipe sailors with all of their tours on the ideal career path. This means that 35 to 39 percent of current CSMMs/Top Snipes in these EMCs have at least one tour off the ideal career path. And, like the EN community, all of these EMCs also have a very small portion of current CSMMs/Top Snipes with at least two tours not on the ideal career path.

Table 9. Career paths of MM, GSE/GSM/GS, and FC-Aegis CSMMs/Top Snipes

	Count	Percentage
MM		
All tours from ideal path	53	65%
At least 1 tour not on ideal path	29	35%
→ At least 2 tours not on ideal path	6	7%
GSE/GSM/GS		
All tours from ideal path	117	61%
At least 1 tour not on ideal path	75	39%
→ At least 2 tours not on ideal path	11	6%
FC-Aegis		
All tours from ideal path	71	64%
At least 1 tour not on ideal path	40	36%
→ At least 2 tours not on ideal path	7	6%

Current CSMMs/Top Snipes who have not followed the optimal career path often take shore tours that are not on the optimal career path.⁶ Specifically, these sailors serve as recruiters or law enforcement

6. Recall that we were not able to track individual's qualifications along their careers, due to limitation in available data. Thus, we were only able to match a sailor's jobs to those on the optimal career path.

specialists, which are jobs that are not on the optimal career path. The fact that the most deviation from the optimal career path occurs on shore tours is not surprising given that (a) the technical-knowledge-enriching shore tour is the primary area where the optimal career path differs from a typical career path and (b) many of the technically enriching shore tours are considered arduous duty that require time on a ship (e.g., ATG and RMC).

In summary, the majority of current CSMMs/Top Snipes in the EN, MM, GSE/GSM/GS, and FC-Aegis communities have all of their tours on the ideal career path. This is a credit to the current community management practices that have been able to get technical-knowledge-enriching tours for sailors before implementation of formal policy. This could also be a consequence of self-selection, in which sailors with technical shore tours are being promoted and given the opportunity to serve as CSMMs/Top Snipes disproportionately compared with their peers. Regrettably, our analysis does not investigate the potential for self-selection bias.

How many CSMMs/Top Snipes have served on the same platform?

Next, we answer the question of how many current CSMMs/Top Snipes have served on a single platform for their entire active duty career. An additional requirement of the optimal career path, though not explicitly indicated, is the desire to have CSMMs/Top Snipes with all of their sea tours on the same platform. This implies that sailors who begin their careers on a destroyer will continue to serve on a destroyer to perfect their skills with this platform. This is a level beyond having technical-knowledge-enriching shore tours and could provide a heavy burden on the Navy Manpower, Personnel, Training & Education (MPT&E) system to fulfill this requirement.

We first note that the optimal career path for CSMM, as given in figure 2, shows that a tour as CSMM on a destroyer followed by a tour as a CSMM on a cruiser is desirable. Thus, there is allowance in the optimal career path for sailors to serve on multiple platforms. Moreover, because of the many varieties of the Aegis weapon system (referred to as baselines), there is a possibility that consistent experience on the same platform would not be a sufficient criterion.

Table 10 shows that, overall, only 13 percent of CSMMs/Top Snipes serve on a single platform for their entire active-duty careers. The highest percentage is in the FC-Aegis community where a fifth of current CSMMs have served on a single platform. This does not come as a surprise since the Aegis weapon system does not exist on many platforms, thus limiting the number of platforms on which FC-Aegis would serve.

Table 10. CSMMs/Top Snipes serving on same platform

EMCs	Single platform		No more than 2 platforms	
	Count	Percentage of sailors on ideal path	Count	Percentage of sailors on ideal path
EN	9	10%	45	52%
GSE/GSM/GS	15	13%	62	53%
MM	6	11%	44	83%
FC-Aegis	14	20%	59	83%
Total	44	13%	210	64%

The last columns in Table 10 show the number/percentage of CSMMs/Top Snipes who have served their entire career on no more than two platforms. Overall, the percentage of current CSMMs/Top Snipes who served on no more than two platforms is 64 percent. This is a large improvement over the single-platform percentage. It suggests that a looser requirement of serving on no more than two platforms is better aligned with current practices, given the career path of current CSMMs/Top Snipes. Yet, the Navy could consider this a weakness of existing CSMMs/Top Snipes and continue to push for single platform experience in the optimal career path.

Career paths for non-CSMMs/Top Snipes

With the implementation of the optimal career path, the Navy needs to be mindful of what type of career opportunities exist for sailors who are not tagged as potential future CSMMs/Top Snipes. Thus, in this part of the study, we examine how well sailors who are not CSMMs/Top Snipes follow the optimal career path. Table 11 shows that, of the 1,849 E7–E9 sailors in the EMCs we use in this study, 46

percent (851) have career paths that did not follow the optimal career path. This result shows that more than half of the sailors who are not current CSMMs/Top Snipes have not followed the ideal career path. Because our sample does not exclude sailors who served as CSMMs/Top Snipes before the present date, it is not surprising that many of the sailors have careers that follow the optimal career path. This fact, coupled with the realization that some of the sailors in this sample may be candidates for CSMM/Top Snipe positions in the near future, makes this large fraction of non-CSMMs/Top Snipes who are on the optimal career path explainable. Overall, we have nearly 50 percent of the population of non-CSMM/Top Snipe sailors with careers that mirror the optimal career path. This result shows that the consistent technical-knowledge-enriching portion of the optimal career path is not difficult to achieve with current detailing practices.

Table 11. Career path of non-CSMMS/Top Snipes

	Count	Personnel not on ideal path	
		Number	Percentage
EN	526	253	48%
MM	652	282	43%
GSE/GSM/GS	413	218	53%
FC-Aegis	258	98	38%
Total	1,849	851	46%

Building the next generation of new CSMMs/Top Snipes

Now that we have shown results on current CSMMs/Top Snipes, we turn our focus to building the next generation of CSMMs/Top Snipes. The main point of the optimal career path is to have a more deliberate approach to giving future CSMMs/Top Snipes rating-enriching experience. This inherently requires the identification of sailors who could be potential CSMMs/Top Snipes at an earlier point in their careers. For this purpose, the Navy has developed a policy to tag future CSMMs/Top Snipes [4].

The Navy recognizes that it is not practical for all sailors to be given the level of technical expertise of the optimal career path, so it has decided to select some fraction of sailors to be directed toward the optimal path by assigning a tracking NEC to sailors. Sailors in the communities that lead to Top Snipe positions are tagged with the tracking NEC after their first sea tours. Sailors in the FC-Aegis community leading to the CSMM position are tagged with the tracking NEC after their qualifying shore tours—typically the first or second shore tour. In this study, we consider all sailors to be identified after their first sea tours. This simplification allows us to consider all sailors at the same point in their careers, although our results may produce conservative approximations for the FC-Aegis community.

The Navy also realizes that, for a variety of reasons, some sailors who are initially tagged to be part of the optimal career path may not end up in CSMM/Top Snipe positions. In the initial phase of implementation of the optimal career paths, however, there is no formal policy for on- and off-ramps to the optimal career path. The purpose of the tracking NEC policy is to ensure that sailors who are potential future CSMMs/Top Snipes are given priority detailing for rating-enriching shore duty and ideal sea assignments. The details of this policy are given in Standard Procedures for Detailing Memorandum #04-13 [4].

In this portion of the study, we determine the feasibility of implementing the program to identify sailors after their first sea tour. We use a three-pronged approach to analyze the *Bodies*, the *Billets*, and a *Blueprint*. We start with the *Bodies*, which determine the number of sailors who need to be identified in each cohort to fulfill the current requirement for CSMMs/Top Snipes. We then move to the *Billets*, which determine if there are enough first-shore-tour jobs available for the sailors identified to participate in the program. After that comes the *Blueprint*, which gives recommendations of the performance of sailors who should be identified to participate in this program, based on the performance of current CSMMs/Top Snipes.

Bodies: How many sailors should be identified as potential CSMMs/Top Snipes?

Each year the Navy would like to tag a certain number of sailors as potential CSMMs/Top Snipes. In this subsection, we determine how many sailors need to be tagged in each cohort to fulfill the current

CSMM/Top Snipe requirements.⁷ First, we describe the methodology that we used and then give quantitative results for each of the EMCs.

The methodology that we use to determine how many sailors to tag is based on survival analysis, a branch of statistics that focuses on the time until some event happens [5]. For example, survival analysis could be used to answer the question of what proportion of the population survives until a certain point in time. In the Navy, this question is often raised when trying to determine how many sailors will be in the Navy at some career milestone. Here, we are interested in how many sailors will remain in the Navy to make CSMM/Top Snipe. In this case, however, we know the answer to this question because we are going to start enough sailors on the optimal career path to meet the CSMM/Top Snipe billet requirements. So, what we are actually performing is an *inverse survival analysis*, in which we answer the question of how many sailors to start on the optimal career path to meet the CSMM/Top Snipe billet requirements. To address this question, we must have data on the continuation rates, advancement patterns (i.e., time-in-grade at the point of advancement), and the billet requirements for the EMCs of interest. We also require the following set of assumptions to determine the number of sailors to tag:

- Cohorts have similar first-sea-tour lengths; thus, all sailors in the cohort would be eligible to be tagged within the same year.
- Continuation behavior of sailors follows a pattern similar to that of 2007 through 2009, when the economy was strong.⁸
- Advancement policy will remain constant, and time to advance will also be relatively constant.

Before using this information in our analysis, we make a key observation about the composition of the CSMMs/Top Snipes. That observation is simply that the CSMMs/Top Snipes come from multiple

7. Often in Navy terminology, the terms *cohort* and *year group* are used interchangeably.

8. This is a conservative assumption that allows us to give numbers based on a worst case scenario. If continuation patterns remain at current levels in a weak economy, our estimates will inflate the number of sailors that need to be tagged. Thus, we give an upper bound on the number of sailors to tag.

cohorts/year groups. This means that every sailor in a cohort won't get the opportunity to be a CSMM/Top Snipe at the same time. Some may become CSMMs/Top Snipes as early as when they achieve the E7 paygrade, while others will not until they become E9s. This led us to first determine the number of CSMM/Top Snipe positions we expected to be filled by an individual cohort. We were able to determine this by using the paygrade distribution of the CSMM/Top Snipe requirements (refer back to table 7) and the average time-in-grade at promotion. For example, the billet requirement for E7 EN Top Snipes is 29 sailors. We are able to determine from the data that the average time-in-grade for E7 ENs who promote to E8 is 50.7 months (4.22 years). Dividing 29 by 4.22 equals 6.9, which is the number of E7 ENs we would expect to be from an individual cohort at any given point in time. When this same procedure is performed for the E8 and E9 EN requirements and summed with the E7 result, the total expected number of Top Snipes from a cohort is derived. The result is that 12.9 of the Top Snipes, at any given time, are expected to be from a single cohort. This number appears in the third column of table 12. Similarly, the expected numbers of CSMMs/Top Snipes from a single cohort for the other EMCs are given in table 12.

Table 12. Cohort requirements for CSMMs/ Top Snipes

EMC	Total CSMM/ Top Snipe billet requirement	CSMM/ Top Snipe requirement filled from a cohort	CSMM/ Top Snipe candidates tagged each year
EN	54	12.9	41
GSE/GSM/GS	103	21.2	60
MM	10	1.8	61
FC-Aegis	84	20.8	55

Now that the expected number of CSMMs/Top Snipes from a single cohort is known, we use inverse survival analysis to determine how many sailors need to be tagged to get the required number of sailors from a cohort. For the EN community, we start with the need to produce 12.9 Top Snipes from a cohort. We then apply the appropriate continuation rates and time-in-grade rules for advancement to determine that 41 sailors need to be tagged in each year to have the 12.9 expected Top Snipes from each cohort. Similar numbers of 60,

61, and 55 are found for the other EMCs—GSE/GSM/GS, MM, and FC-Aegis—as seen in the last column of table 12.

Notice in the table that the MM community has the largest number of sailors who need to be tagged to meet their Top Snipe requirement, yet the MM community has the lowest Top Snipe billet requirement. This occurs because of the low continuation rates in the MM community, relative to others. For example, only 4 percent of the MM sailors who are coming off their first sea tours make it to E9. In contrast, 13 percent of EN sailors coming off their first sea tours make it to E9. To compound this attrition issue in the MM community, all of the Top Snipe billet requirements are E9 requirements (refer back to table 7). This means that sailors in the MM community usually must remain in the Navy for longer before they get their first opportunity for a Top Snipe tour. This is not the case in the GSE/GSM/GS and EN communities, where Top Snipe opportunities can start as early as E7. The combination of these two factors leads to a large number of MM sailors being tagged for a relatively small Top Snipe requirement for the community.

Billets: Are there enough rating-enriching first-shore-tour billets for all tagged sailors?

One of the hallmarks of the optimal career path is having rating-enriching shore duty. At no time is this more critical than on a sailor's first shore tour, mainly because the Navy wants to tag sailors as potential CSMMs/Top Snipes on assignment to their first shore assignments. So it is vitally important for the Navy to have sufficient rating-enriching shore opportunities for all the sailors it would like to tag as potential CSMMs/Top Snipes.

When sailors enter the first shore tour, they have a range of paygrades, from E4 to E6, depending on various characteristics (e.g., pace of training, opportunity for advancement, and prior education credit). Combined with the Navy's 1-up/1-down detailing policy,⁹ this

9. The Navy's 1-up/1-down detailing policy allows for flexibility in the match of paygrade between sailor and requirement when making assignments. A ± 1 allowance allows a sailor to fulfill a slightly more junior or senior requirement. The policy applies only within pay bands (i.e., apprentice: E1–E4, journeyman: E5–E6, supervisor: E7–E9).

means that there is a wide range of jobs available to sailors. To incorporate all of the possible assignments for a first shore tour, we use all petty officer shore billets as a starting point. From this total, we identify the billets that correspond to jobs that are considered rating enriching according to the optimal career path. This calculation results in the totals presented in the second column of table 13.

Table 13. Rating-enriching shore billets for CSMMs/Top Snipes

EMC	Enriching petty officer shore billets authorized (BA)	
	Total	Annual
EN	154	51.3
GSE/GSM/GS	284	94.7
MM	324	108
FC-Aegis	271	90.3

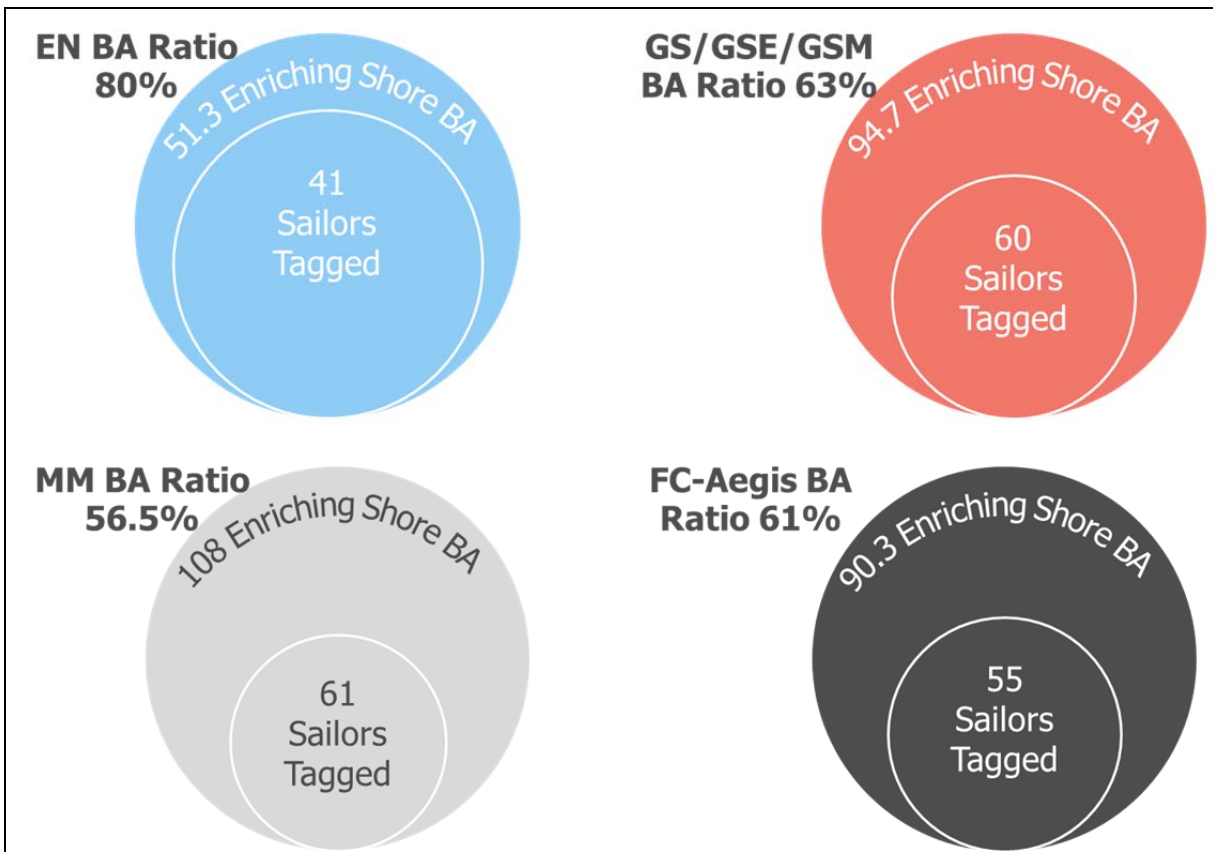
While the total petty officer rating-enriching shore billet requirement is useful, it does not give the total picture. Next, we need to understand how many jobs would be available on an annual basis. To perform this calculation, we recognize that the EMCs included in our study have three-year first shore tours. This allows us to estimate that one-third of the positions will be available each year. The result of that calculation is presented in the third column of Table 13.

Finally, we compare the annual rating-enriching petty officer shore billets available, from Table 13, with the number of potential CSMMs/Top Snipes we would like to tag, from table 12. This comparison allows us to determine the feasibility of the number of potential CSMMs/Top Snipes that the Navy must tag to grow the number of CSMMs/Top Snipes to fulfill the billet requirement. If there are adequate rating-enriching jobs at the point when the Navy would like to tag sailors, it should be able to grow enough CSMMs/Top Snipes on the optimal career path to fulfill the billet requirements.

Figure 3 shows a representation of this comparison. The inner circle for each EMC represents the number of sailors the Navy needs to tag from each cohort. In this graphic, the inner circle has been scaled such that the percentage of area that overlaps with the outer circle represents the ratio of sailors tagged to annual enriching first-tour

shore billets available. Figure 3 shows that for each EMC the ratios are less than 100 percent, indicating that it is feasible to find rating-enriching shore duty for all the sailors the Navy needs to tag as potential CSMMs/Top Snipes. Most EMCs require only about 60 percent of the enriching petty officer billets. This is reassuring because it leaves rating-enriching shore duty opportunities for sailors who may not be selected for tagging after their first sea tours. This adds flexibility to potentially tag additional sailors after their first shore tours because they would have had the two initial tours on the optimal career path. In other words, the fact that there are opportunities for sailors who are not tagged to have rating-enriching shore duty opens up the possibility of rewarding “late bloomers” who show high technical aptitude at later points in their careers.

Figure 3. Ratio of enriching shore BA



EN is the only EMC that figure 3 shows having a large portion of its rating-enriching petty officer shore billets needed for the sailors who are being tagged. Our analysis shows that 80 percent of the rating-enriching shore billets would be required for the sailors tagged as potential Top Snipes. The Navy recognized this potential shortage and has recently purchased additional rating-enriching shore billets in the EN community to lower this ratio.

Blueprint: Which sailors should be tagged with the tracking NEC?

Although the Navy has not identified specific criteria or qualifications for sailors it would like to tag as potential CSMMs/Top Snipes, it is agreed that the sailors should have high technical abilities. More specifically, the Navy is looking for sailors who are proficient at performing their in-rate work. In this subsection, we provide insights into which sailors should be tagged as potential CSMMs/Top Snipes.

To better understand what allows a sailor to make it to CSMM/Top Snipe, we analyze the test scores of current CSMMs/Top Snipes. We are particularly interested in their technical abilities, so we examine the occupational component of the E5 advancement exam; we also study the performance mark average (PMA), which is the way recent evaluations are included in determining sailors' ability to advance.¹⁰ We selected the E5 advancement exam for current CSMMs/Top Snipes because it is similar to the point where the Navy now wants to identify sailors as potential CSMMs/Top Snipes. So we are assuming that all sailors in the EMCs we study have taken the E5 advancement exam at least once by the time they reach their first shore tour.¹¹ If the current CSMMs/Top Snipes are top performers on their E5 exam and PMA, we can say that top performance on the E5 exam is a leading indicator of becoming a CSMM/Top Snipe. If, however, the current CSMMs/Top Snipes are not top performers on the E5 exam and

10. See Golfin and Carey [6] for details on components of the advancement examination and PMA.

11. Sailors in the EMCs used in this study advance to E5 relatively quickly in comparison to their peers in other less technical EMCs. Many factors, however, influence when a sailor advances, so there is a possibility that a sailor has not taken the E5 advancement exam by his or her first shore tour. But those instances should be rare.

PMA, it suggests that the Navy would want to consider a different point in a sailor's career to tag him or her for the optimal career path. This potential negative outcome should not be misinterpreted. It does *not* mean that the current CSMMs/Top Snipes are of poor quality; the Navy is confident that the advancement process is promoting the best and brightest to senior ranks. The optimal career path is strictly about providing technically enriching opportunities, not selecting better sailors.

The process that we use for this portion of the analysis starts with all the CSMMs/Top Snipes as of March 2013. We track their Navy careers back to when they first took the E5 exam and compare their scores with those of all time-in-grade eligible sailors who took the same E5 exam for the first time with the CSMMs/Top Snipes. This allows us to compare the distribution of the current CSMMs/Top Snipes with the group of sailors who took the E5 advancement exam with them but who are not currently CSMMs/Top Snipes.

The first observation that we make is that the PMA is not a good metric to distinguish the two groups. There is little overall variation in PMA scores: the average PMA for the CSMMs/Top Snipes is 3.83, while the average PMA for all other non-CSMMs/Top Snipes is 3.8. Because this difference is not statistically significant, it eliminates the possibility of using PMA for distinguishing between the two groups.

The E5 advancement exam data are used to compare the empirical distribution of the CSMM/Top Snipe group with the expected distribution for a randomly selected group of sailors who took the same exam. When we translate the distribution of exam scores into quintiles,¹² we would expect that a random sample of sailors would have scores uniformly spread across the quintiles. This would be evidence that the sample exhibits average scores in comparison to the group of all test takers. For our sample of 439 CSMMs/Top Snipes, that would represent about 88 (or 20 percent) CSMMs/Top Snipes in each quintile (see table 14). Instead, table 14 shows us that a disproportionately

12. The process of translating the exam score distribution in quintiles is not discussed in great detail in this document; however, the process amounts to identifying the lowest 20 percent of scores, then the next highest 20 percent of scores, and so on.

large number of current CSMMs/Top Snipes score in the top 20 percent on the E5 advancement exam. The fact that 136 CSMMs/Top Snipes score in the top 20 percent of the exam takers represents statistically significant evidence that CSMMs/Top Snipes are more likely to be in the top 20 percent of their exam cohort. This result leads to two important points about selecting candidates for future CSMMs/Top Snipes:

1. The Navy is doing a good job of advancing top-performing sailors. The fact that the current CSMMs/Top Snipes scored well on their E5 advancement exam, before a program was in place to target them as potential future leaders, is a testament to the success of current Navy advancement and placement policies.
2. If the Navy would like to identify good potential candidates for CSMM/Top Snipe, the result of the E5 advancement exam is a good barometer.

Table 14. Distribution of current CSMM/Top Snipe E5 exam scores

	Percentile				
	20	20–40	40–60	60–80	80–100
Expected proportions	20%	20%	20%	20%	20%
Expected counts	87.8	87.8	87.8	87.8	87.8
Actual counts	54	58	90	101	136
Actual proportions	12%	13%	21%	23%	31%

When we examine the scores for the individual EMCs, the results are similar. Table 15 shows that the percentage of current CSMMs/Top Snipes who have E5 advancement exam scores in the top 20 percent by EMC.¹³ For the EN and FC-Aegis communities, the percentage in the top 20 percent is very close to the overall average of 31 percent

13. The full distribution of each EMC is found in the appendix.

and is statistically significant. The MM community also shows a statistically significant result with 42 percent of current MM Top Snipes scoring in the top 20 percent of their advancement exam. The GSE/GSM/GS community, however, has only 27 percent of its current Top Snipes scoring in the top 20 percent. This number is not statistically significantly higher than the expected proportion of 20 percent. For a deeper analysis of this community, we examine the three EMCs that make up the GSE/GSM/GS community separately. In table 18 through table 20 of the appendix, we present the complete distribution for the individual communities that make up the GSE/GSM/GS community. These tables show that there is a low percentage of Top Snipes in the top 20 percent for the GSE and GSM communities—18 and 24 percent, respectively—both not statistically significant. But the GS community has a statistically significant percentage (33 percent) of Top Snipes who scored in the top 20 percent. This may be explained by the fact that the GS community is a compression community, meaning that sailors can only enter the GS community after advancing to E8 from the GSE and GSM communities. In terms of selection of sailors for tagging as potential Top Snipes, our data show that the E8 advancement board is a better metric for the GSE/GSM/GS community, although it is achieved at a much later point in a sailor’s career.

Table 15. CSMM/Top Snipe E5 exam results by EMC

EMC	Percentage in top 20 percent
EN	33%
GSE/GSM/GS	27%
MM	42%
FC-Aegis	32%

In summary, our analysis shows that current CSMMs/Top Snipes score in the top 20 percent on the E5 exam in larger proportions than expected. Thus, the results of the occupational component of the E5 advancement exam can be used as a guide to assist in identifying future CSMMs/Top Snipes.

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Conclusions/recommendations

We have presented the optimal career path for the CSMM/Top Snipe positions. This career path is one that is focused on technical enrichment of work on both sea tours and shore tours. There is some flexibility in the optimal career path to having multiple types of technically enriching positions and to fulfill various qualifications at different points in a sailor's career. The Navy believes that when sailors follow the optimal career path they will be more proficient CSMMs/Top Snipes, although this claim is currently based solely on anecdotal evidence.

Answers to key research questions

In the beginning of this paper, we proposed three research questions. Here, we summarize the answers to each question.

What are the career paths of sailors who are currently serving as CSMMs/Top Snipes?

The career paths of current CSMMs/Top Snipes are very similar to the optimal career path. In fact, most sailors serving in CSMM/Top Snipe billets today have followed the optimal career path. We conclude that the distribution system has done a satisfactory job of identifying future CSMMs/Top Snipes and giving them the meaningful, technically enriching tours required of the optimal career path. The biggest area for improvement is having future CSMMs/Top Snipes serve all of their sea tours on the same platform. Current data show that platform-specific detailing is not occurring for the sailors in our study. And a requirement of serving on no more than two platforms would be more in accordance with current practice.

Does the current billet base support the implementation of an optimal career path?

The Navy's current billet base, for the EMCs we examined in this study, supports the optimal career path. This means that there are sufficient technically enriching shore and sea opportunities to have

select sailors follow the optimal career path. This is particularly true of the technically enriching shore opportunities on the first shore tour, where sailors are first tagged with the tracking NEC as potential future CSMMs/Top Snipes.

How can potential CSMM/Top Snipe candidates be identified?

The current CSMMs/Top Snipes are top performers, in comparison to their peers, at the time they first take the E5 advancement exam. We show that the current CSMMs/Top Snipes score in the top 20 percent on the occupation component of the exam at higher than expected rates. This allows us to use the performance on the E5 exam as a leading indicator of who will become future CSMMs/Top Snipes and as a decision criterion for selecting sailors to tag with the tracking NEC as potential future CSMMs/Top Snipes.

Recommendations

Based on our analysis, we recommend that the Navy move forward with the implementation of the optimal career path. Our results show that a significant portion (two-thirds) of current CSMMs/Top Snipes have career paths with all of their sea and shore tours on the optimal career path. One-third of current CSMMs/Top Snipes, however, would have had more technically enriching tours with the optimal career path policy. Moreover, only 13 percent of current CSMMs/Top Snipes serve on a single platform throughout their careers. With the implementation of the optimal career path, we would expect this number to increase significantly. This is the biggest potential improvement area from the optimal career path.

There is evidence that the optimal career path is feasible for implementation for select sailors in the EN, GSE/GSM/GS, MM, and FC-Aegis communities without changing the existing billet structure. The results presented in table 12 show the number of sailors who should be tagged in each cohort or year group. In cases, where significant portions of a cohort have different initial sea tour lengths, the results presented in table 12 can be generalized to an annual requirement for tagging sailors. More specifically, 41 EN sailors, 60 GSE/GSM/GS sailors, 61 MM sailors, and 55 FC-Aegis sailors should be tagged with the tracking NEC each year to ensure a sufficient number of CSMMs/Top Snipes for future years. This result is based

on advancement and continuation behavior of a good economy; in a bad economy with higher retention, these numbers would be reduced. Ultimately, the implementation of the optimal career path policy has few risks in negatively affecting existing career paths, except for the potential of bifurcation of communities.

We also recommend that the Navy more precisely define sailors in its data systems who are serving as Top Snipes. The current system of using the 4206 DNEC is insufficient for determining the actual sailor who is the Top Snipe. Adding another designator to the 4206 DNEC would help to facilitate future research.

As the optimal career path is implemented, we suggest that a follow-on study be performed to determine the effectiveness of the initiative with more concrete proficiency metrics. This type of longitudinal study would require several years since sailors who are being tagged now are still at least 10 years away from their CSMM/Top Snipe tours. Yet, in the interim, there is a need to better understand potential on-ramps and off-ramps to the optimal career path and the real and implied career implications for sailors who opt into or out of the optimal career path.

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Appendix: Distribution of E5 exam scores

This appendix gives the distribution of E5 exam scores for each EMC that is included in the study.

Table 16. Distribution of EN Top Snipe E5 exam scores

	Percentile				
	20	20–40	40–60	60–80	80–100
Expected proportions	20%	20%	20%	20%	20%
Expected counts	25.6	25.6	25.6	25.6	25.6
Actual counts	16	9	33	28	42
Actual proportions	13%	7%	26%	22%	33%

Table 17. Distribution of GSE/GSM/GS Top Snipe E5 exam scores

	Percentile				
	20	20–40	40–60	60–80	80–100
Expected proportions	20%	20%	20%	20%	20%
Expected counts	36.2	36.2	36.2	36.2	36.2
Actual counts	23	33	38	39	48
Actual proportions	13%	18%	21%	22%	27%

Table 18. Distribution of GSE Top Snipe E5 exam scores

	Percentile				
	20	20-40	40-60	60-80	80-100
Expected proportions	20%	20%	20%	20%	20%
Expected counts	12	12	12	12	12
Actual counts	9	12	15	13	11
Actual proportions	15%	20%	25%	22%	18%

Table 19. Distribution of GSM Top Snipe E5 exam scores

	Percentile				
	20	20-40	40-60	60-80	80-100
Expected proportions	20%	20%	20%	20%	20%
Expected counts	5.8	5.8	5.8	5.8	5.8
Actual counts	3	6	7	6	7
Actual proportions	10%	21%	24%	21%	24%

Table 20. Distribution of GS Top Snipe E5 exam scores

	Percentile				
	20	20-40	40-60	60-80	80-100
Expected proportions	20%	20%	20%	20%	20%
Expected counts	18.4	18.4	18.4	18.4	18.4
Actual counts	11	15	16	20	30
Actual proportions	12%	16%	17%	22%	33%

Table 21. Distribution of MM Top Snipe E5 exam scores

	Percentile				
	20	20–40	40–60	60–80	80–100
Expected proportions	20%	20%	20%	20%	20%
Expected counts	9	9	9	9	9
Actual counts	4	4	7	11	19
Actual proportions	9%	9%	16%	24%	42%

Table 22. Distribution of FC-Aegis Top Snipe E5 exam scores

	Percentile				
	20	20–40	40–60	60–80	80–100
Expected proportions	20%	20%	20%	20%	20%
Expected counts	17	17	17	17	17
Actual counts	11	12	12	23	27
Actual proportions	13%	14%	14%	27%	32%

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Glossary

ATG	Afloat Training Group
AWS	Aegis Weapon System Supervisor
BA	Billets Authorized
COMNAVSURFOR	Commander, Naval Surface Forces
CSC	Combat System Coordinator
CSCS	Center for Surface Combat Systems
CSMC	Combat System Maintenance Central
CSMM	Combat Systems Maintenance Manager
CSOOW	Combat System Officer of the Watch
DET	Detachment
DLCPO	Departmental Leading Chief Petty Officer
DNEC	Distributable Navy Enlisted Classification
EOOW	Engineering Officer of the Watch
EMC	Enlisted Management Community
EMF	Enlisted Master File
EN	Engineman
ETT	Engineering Training Team
FC-Aegis	Fire Controlman–Aegis
GS	Gas Turbine Systems Technician
GSE	Gas Turbine Systems Technician–Electrical

GSM	Gas Turbine Systems Technician–Mechanical
LCPO	Leading Chief Petty Officer
LPO	Leading Petty Officer
MM	Machinist Mate
MPT&E	Manpower, Personnel, Training & Education
MSS	Missile System Supervisor
MTS	Master Training Specialist
NEC	Navy Enlisted Classification
NPC	Navy Personnel Command
NSWC	Naval Surface Warfare Center
PMA	Performance Mark Average
PRT	Personnel Readiness Team
RMC	Regional Maintenance Center
RSC	Radar System Controller
RTC	Recruit Training Command
SRF	Ship Repair Facility
SURFOR	Surface Forces
SWE	Surface Warfare Enterprise
SWOS	Surface Warfare Officers School
WCS	Work Center Supervisor

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