

Final Paper

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1. Introduction

Since I was young, I have wanted to work for the United States military. Once I started college back in the 1990s, I wanted to serve in the U.S. Navy. Life often changes one's plans, and I did not enlist, but I married into it. For many years, I applied for jobs in the Navy but was not selected. More than 20 years later, I returned to school in Cybersecurity. This field has always fascinated me. What I did not know then was the opportunity it would bring.

In the fall semester of 2023, Old Dominion University encouraged me to apply to the Department of Defense's cybersecurity scholarship program. While filling out the application, they asked for agency preference, and I selected the U.S. Navy Naval Sea Warfare Centers on the East Coast. During the Spring semester of 2024, I went through the interview process and was accepted to start an Internship in the Summer of 2024. I have been allowed to stay as a full-time intern since then.

When I produced my objectives at the start of this class, I wanted them to be specific to my internship. My first objective was to learn the proper procedures used by the naval forces to integrate cybersecurity into their existing systems. My second objective was to see how the civilian force improves risk management by reconciling the existing network environments with the new cybersecurity frameworks. My last objective was to see how well Old Dominion University prepared me for this workforce.

This paper will discuss my achievements and trials during my internship and how they shaped my professional path. It will also describe what to expect in this type of internship. Let's start with a brief history of the U.S. Navy.

2. Brief History of the U.S. Navy

The US Navy was founded on October 13, 1775, known as the Continental Navy, which was created for the American Revolution. When this period ended, the Navy dissolved. The French Revolution showed the United States that an institution that promoted the safety of the seas was needed, and the Navy was reestablished in 1794. The signing of the Naval Act in 1794 supported the construction of 6 Frigates and the restoration of the Navy. 1798, Congress created the Department of the Navy due to mounting tensions between France and the US.

After the American Civil War (1861 to 1865), the Navy suffered another decline (1865-1882). Between 1882 and 1898, after some persuasion from experts in naval warfare, Congress allocated the necessary funds for the Navy's rebuilding. By 1898, the US Navy was able to fight naval battles with Spain over territories occupied by the latter. The victories of this war gave important lessons about strategy and the need for a naval fleet.

Between 1898 and 1941, the US Navy expanded and created submarines and naval carriers. These carriers gave the US Navy the power to launch planes from floating platforms on the sea, helping to conserve fuel and conduct missions from anywhere in the maritime world.

During the Second World War, the United States tried to stay neutral in the conflict, but Japanese carriers attacked Pearl Harbor, bringing the US into the conflict. After the success of World War II, the US Navy helped the US to establish itself as a Superpower. When the Soviet Union fell in 1991 after the Cold War, the United States emerged as the only superpower in the world. The modern Navy contains 11 strike groups with US Carriers at their center and multiple vessels to protect them. This is significant since the US can simultaneously maintain conflicts on two fronts without losing the workforce.

The division I worked for in the internship, Naval Sea Warfare Center (NSWC), was created in 1862. Still, it wasn't until 1991 that it was consolidated into what it is today by putting together the Science and Technology Subdivision with the Research, Development, Testing, and Evaluation one. This concentrated 30% of the workforce in Engineering and Science to support the Fleet.

3. Start of the Internship

On June 17, 2024, I started my internship with an orientation week. To work in some areas of the Navy, you need a Secret Clearance. During this time, you fill out paperwork related to obtaining one. One of the pieces of paperwork asked about where you have lived for the last 5 to 7 years, whether you have family or friends in other countries, and if they are associated with the external government, among other questions. While it seems invasive, it is necessary to answer truthfully since they investigate your life to see if you are trustworthy. The other paperwork is a non-disclosure agreement. Once signed, you are bound by law not to discuss anything classified with anyone.

During the first day, we were taken into the command room and pledged to the Constitution and the Republic. Like the military pledge, the civilian workforce promises to uphold the Constitution and defend the Republic from foreign and domestic enemies. The week is then divided into security, work by division, creation and activation of your work accounts and passes needed to access different areas of the buildings and base. A card with a chip is created. This card contains your information and the permits for each location. You cannot display this card, and a second card is issued with your picture and a color depending on your classification. It must always be displayed on your upper torso while in your work area and building for security reasons.

This first week is very intense in terms of the amount of information you must provide and learn. It is important that you pay attention and complete everything on time to have access

in a timely manner. Each training during orientation week is important for initial access and assignment of assets that will help you complete your work.

At the end of this first week, I was assigned to the Cybersecurity Subdivision of the Naval Warfare Center. This subdivision oversees the software products developed for the fleet, conducts tests, and ensures that each product meets the Department of Defense cybersecurity framework. They also create the fleet's Standard Operating Procedures (SOPs) and Standard Installation Procedures (SIPs). This allowed for easier installation and troubleshooting of systems.

The Naval Sea Warfare Center's customers are the US Navy Fleet, and their products are aimed at developing solutions for them. They are also the bridge between the technical community and the fleet. They are the technical advisors for the government in warfare areas. The products developed by NSWCs are used in combat systems for offense and defense. They create partnerships with laboratories in the Department of Defense and the private sector, academia, and national security agencies to create cost-effective, advanced technical solutions that protect lives and freedoms.

My first impression was great. I was assigned to another intern in the program for some time. He showed me the systems and how to access them. He was very thorough and patient with me. He also provided me with tools like check-in pages, how to access training, and documents that will help me learn better. I was also provided with research assets and a secure testing environment. I was given small tasks to complete and testing to do for the fleet.

4. Leadership

My experience with leadership has been excellent. In the subdivision I belong to, the leadership is very effective. An open-door policy is in place, and leaders encourage visits from the workforce. While I respond directly to the Branch Head, the Project Manager assigns the week, month, and year of work. Team leaders are given tasks and responsibilities and distribute them to the teams. You are provided with healthy feedback and guidance to complete the tasks if needed. They also provide you with the specifics needed to complete the tasks satisfactorily.

Being treated as a human being, with respect and kindness, is essential to me, and I received that here. They expect you to complete your work responsibly and to show professionalism. One of my favorite things is that you are not micromanaged while you have completed your tasks. You are an adult, and you are treated as one. They give enough time to complete assignments, unless an emergency on the fleet systems happens. They also give you the tools to explain why a particular task is unfinished, especially on products that depend on more than one team to produce. These tasks are called non-critical and put on hold until all the parts are available.

Another good thing about leadership is finding help to obtain assets or access to perform your duties. Leaders call each other if you must visit a different area, and someone will escort you on time. Protected spaces can be accessed with the correct paperwork, and unless you don't have the proper classification, you can finish your assignment. If you cannot enter a protected space, they will assign a partner to complete that part and add it themselves to the assignment after you finish your part.

5. Assignments

When I first started, a teammate and I worked with small scripts to automate tedious tasks like checking for specific files or folders. These scripts help to save time to concentrate on more critical tasks. Over time, I was taught how to work on determining vulnerabilities and patching them to comply with the cybersecurity framework and provide protection to the systems. Using cyber tools, we scan the systems and deliver the solutions. These solutions are passed to the fleet with proper documentation and patched software to keep the systems secure.

Now I belong to the development team. We make sure that the laboratory environment and the fleet match. This is important because this laboratory tests how patches and applications affect systems in real time. Once verified, the team produces the correct manuals for the fleet. These manuals are called Standard Operating Procedures and Standard Installation Procedures. These standards are developed so that everyone in the fleet follows the same steps according to systems and areas. They also provide troubleshooting steps and remediation ones.

These procedures are essential because they can cause communication or functional problems if steps are missed. The procedures then go into testing and re-testing until all the steps are correct. They are finally given to the leading project manager and engineer for signature and distribution. We also provide live support to the fleet through secure email and phone calls. We offer troubleshooting steps if the ones in the procedures don't work. We also document changes and update the procedures to match the new developments. These help the teams and the fleet troubleshoot more effectively if the problem arises again.

Another project I am working on is creating a secure database to produce and update specific documentation. This database will allow the storage, update, and printing of specific documentation for the installation teams and fleet. The branch head assigned this project to another intern and me. This project required the development of the database and compatibility with a specific application for the documentation to have a particular format. It is slow progress, but we are advancing. Being able to help the teams, even in small tasks, is satisfactory and shows the level of care for your teammates.

6. Skills

Prior to my internship, I acquired technical skills in Windows, Linux, and multiple application products, which have been very useful in the technical part of my internship. I also have skills in technical writing that have benefited my team since most of the documentation my team and I produced meets the head engineer's standards, and only minor adjustments are needed.

I work with virtual machines, networks, and other tools, and learned valuable information and techniques during my internship. I know how to use the Security Technical Implementation Guides (STIGS), which provide security guidance and configuration setting for the US government systems. These standards are under the DOD 8500.01 documentation, and they help to bridge the gap between the National Institute of Standards and Technology (NIST) Special Publication 800-53 and the Risk Management Framework (RMF). These guides are the current standards, and the Department of the Navy takes seriously the application and meeting of those standards. They are also one group that provides feedback to NIST, which helps keep those standards current.

My skills as a developer have expanded, and I have learned new techniques to save time without sacrificing security. I have also learned more programming languages and scripting, which will benefit my quest to become an Ethical Hacker.

Now I understand better how risk management works. I know how each new system and its components must be safely introduced to the environment. I know and have learned the proper procedures that the US Navy requires. Everything is a delicate dance that requires careful consideration. Any adverse effect can compromise the mission and safety of the fleet, so a person working in this environment must be cautious in developing and deploying products.

7. ODU Education

Old Dominion University has provided me with a solid foundation for this internship. My Cybersecurity classes showed me the different frameworks, critical thinking, prioritization, and problem-solving. The laboratories have been on point and helped me navigate the systems here. The base provided by ODU allowed me to concentrate on performing my job without distractions. The Linux and Windows tools learned in class have been handy, and I even taught some older people the new tools available, which help them save time. Teamwork and communication have been critical at my work since everything must be discussed and tested before deployment.

Some new concepts were SCAP (Security Content Automation Protocol) which is a method for specific standards for vulnerability management, STIGs explained previously, and many Acronyms that I cannot reveal due to the non-disclosure agreement. One thing I notice

about the US military is that they love their acronyms and even have a dialect that takes some time to learn. I learned some with my husband, but daily use is an entirely new experience. Since civilian and military personnel interact daily, you must know and understand it.

8. Objectives and Fulfillment

Cybersecurity is an everyday job for the military. The support they received from the civilian workforce is critical since we serve as their research team. There are times when they cannot do their research to fix something, and they need to have a reliable source of information. One of those things is cybersecurity and vulnerability research. I wanted to learn how they implement cybersecurity in existing systems that are critical in nature. I know how to do it in a safe environment without risky systems. The procedure is delicate and requires extreme caution since these systems are in control of others. Being able to learn to do it was a very satisfactory experience.

My other objective was to see how risk assessment was conducted. Cybersecurity is a careful dance of what needs patching due to extreme vulnerability and the likelihood of exploitation, and if it can stay as is because the possibility of exploitation is minimal. In the laboratory testing, we reviewed the different categories of vulnerabilities and how they were addressed. Some were not implemented because another component addressed the problem, and the solution was not needed. In these cases, notes were made in the audit documentation to address any questions. The testing environment was also used to double-check that the solution did not affect another system component. These tests sometimes cause problems. The vulnerability was checked, and I consulted with the deployment engineers during those times. They would decide how to proceed. This objective was also met.

Finally, I wanted to see how much ODU education was on point with the work environment. ODU confidently prepared me for this work. Every assignment taught me something and how to navigate different conflicts. The discussion board taught the importance of written communication and respect. Being able to disagree while remaining calm and collected is imperative in a stressful workplace. Sometimes tensions will be sky high, and maintaining composure and professionalism is very important.

Every presentation allowed me to become less anxious about speaking to a group, and every research paper taught me the importance of reliable information. When researching a product or application, it is important to find unbiased information to present to your team. My education has been a significant investment, and I do not regret attending ODU.

9. Internship Motivation

One of my primary motivations has always been learning. Each day brings a new challenge that requires careful research and learning new things. Since technology is constantly changing, the opportunity to learn is always present. Solving a problem, providing help, and working with like-minded people help make the job a pleasant experience.

Another motivation is the opportunity to travel. The opportunity is present in the continental USA, US territories, or overseas. Since training is included for the interns, having paid training that provides well-known certifications is another incentive to do a good job. We also rotate through the subdivisions to learn and grow our skills. After the first year, a rotation of 4 to 6 months is required, and the possibility of landing in an area of research or one that requires new skills is excellent. Having a flexible schedule is also a great motivation. They don't bother you if you enter between 6 am and 9 am and complete eight work hours. I usually arrive at 6 to 6:30 am and can leave before 3 pm.

But the most motivating aspect is the satisfaction of completing a job you know you gave your all to. Being assigned something from simple to complex and finishing it to the best of your abilities is a reward. They observe what you do and compensate accordingly. Depending on the assignment, you can receive a bonus or free time. They provide you with benefits from the start, like the military. Retirement and paid education are some incentives to encourage the workforce

10. Discouraging Aspects

Some discouraging aspects are seeing people without drive. Sometimes you meet someone who does not care about their job and whose words and actions do not match. They can be smart but behave frustratingly. An example is a young person who does not want to learn aspects of the job because it is not part of the job description. Often, something simple can help them complete a task faster, but because it is not part of the job description, they won't learn. The problem arises when they are required to finish another task, and because they did not know the tool or procedure before, they interrupt other people's jobs to be taught. While I do not mind teaching someone or helping someone refresh a skill, it is frustrating to hear "learning that is not part of my work description" on a Monday and Wednesday, hearing the same person ask for help to a busy coworker. The interruptions and wasted time bother me, not because of assisting them, but because that person does not respect other people's time and work schedules.

Another discouraging aspect has been the changes in politics and personnel around the workplace. Many people left in the last few months, and their absence can be felt because the fleet's needs are significant. The restructuring has been painful for everyone, and the absence of those who left with specific skills is greatly missed. I know we eventually will find the solutions, but the growing pains to get there are felt through the division.

11. Challenging Aspects

One challenging aspect is that the exit of so many people has left a hole in the documentation and task completions, as well as a shortage of personnel. Prioritization has been more critical than ever to complete all the tasks promptly. In a fast-paced environment, the need to stop everything to concentrate on emergencies has brought home the missing pieces of our team.

Another challenge has been updating old documents. Some documentation cannot be discarded and needs to be updated. Since many of the original creators are no longer with the organization, updating those documents only through research has been an interesting challenge. It required many outside-the-box strategies to perform updates and update the documentation.

Another challenge is my daily commute. I have lived in the Hampton Roads area for more than 15 years, and the commute has been constant. I must travel each day from Hampton to Virginia Beach and back. Arriving home after that long commute to study has been quite a challenge. I made it to the end of my bachelor's and will graduate in the next few weeks. My next journey starts in August, but in the meantime, I will rest and concentrate on my job.

12. Recommendations

The first recommendation is to consider the pros and cons of a government job. If you do not like the military, this job is not for you, since part of your day requires interaction with military personnel. Working here requires a person who can operate under pressure in a fast-paced environment. If you do not react well to those environments, this experience is not for you. Doing a summer internship is good if you do not know how you will feel about any of those aspects. You will acquire experience, money since it is paid, and something nice for your resume.

If you take the scholarship, you will be legally required to sign a contract with the agency that will be your sponsor for some time. The time required depends on the years of sponsorship. If they paid for one year, you served for 1.5 years. The advantage of this is that you have a secure job when you graduate, and you can leave after you finish your repayment time. This will significantly upgrade your resume, since other employers see working for the Department of Defense and its agencies as good.

Another aspect is that it depends on the program you are selected for. I entered through the Cybersecurity Scholarship Program. After I entered, I was offered a change in programs, and that change allowed me to work as much or as little as I wanted each week and permitted me to stay year-round. Because I finished my degree this semester, I was transferred to civilian status and given a position as an engineer with the team. If you can handle that kind of push, becoming a student trainee is for you. If you only want to work in the summer, then the Cybersecurity

Scholarship program is your answer. But once again, this type of internship is only for those who like the military and its association.

If you decide to apply and are selected, start preparing documentation of where you have lived and your friends and associates in different countries. Ensure your documentation, like your passport, birth certificate, and similar documents, is in order. It will save you time and accelerate the onboarding process. Be mindful and behave professionally, know and respect boundaries, and be courteous, and you will have a great experience.

13. Conclusion

This experience has been a dream come true for me. Having the opportunity to work for the US Navy was part of my goals, and ODU helped me achieve them. I have learned new technologies, processes, and procedures. My people network has grown to include diverse people from different backgrounds. I find motivation in my work and satisfaction in my professional life.

My internship has motivated me to continue my learning journey. I applied and was accepted into the Cybersecurity Master's program at ODU Global. I am also getting ready to do training with the deployment team and travel to support the fleet. I am working on my commercial certifications, such as Pentest+, Network+, and Security+, among others. Being able to receive free training in life matters like CPR and First Aid is an excellent motivator.

Thanks to this internship, I cemented my desire to become a Cybersecurity specialist in Ethical Hacking. I want to reach my goal and join the Navy's red team. I am sure I will get to that position with dedication and hard work. In the meantime, I will continue to provide excellence in my job and educational career.

The internship met and exceeded my expectations. I was able to meet my objectives under the guidance of excellent leaders and peers. I have become friends with some coworkers who have supported my growth and helped me on my journey. They celebrated my success and helped me when I felt overwhelmed. I have been able to reciprocate and help those who needed an ear or shoulder in sad or frustrating moments.

Every moment, good and bad, has been a learning experience. One of the most important lessons is the ability to distinguish between things you can control and change and others you must let go of because they are out of your control. Stressing over things you cannot control only creates more problems. Knowing you gave your all to a task and cannot fix it is enough. Often, they will substitute the equipment, application, or procedure to change the outcome.

In conclusion, my internship has been an incredible experience. It had highs and lows, but each one was unique. My coworkers are from different backgrounds and generations. Being a student trainee from an older generation has brought home the importance of never giving up

your dreams. Sometimes it's entertaining to see different generations interact, especially between people who served in the military and those who did not. People who have served tend not to have filters to express frustration, and because of the environment, have created very funny expressions. For people who meet them daily and understand, it's entertaining to see the faces of those who have never heard the expression. The look of confusion is hilarious, and the team's closeness can be observed in moments like that.

I recommend this experience to those who are willing to take on a challenge and dream of supporting our troops and national security. It was one of the best experiences of my professional life.