



UIDPCONNECT  
2020

# Leveraging Apprenticeships for High-Value Talent Development

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# NSWC Crane Division

## Developing and Maintaining the Cyber Workforce

*Presented by: Ms. Patricia Herndon, SSTM  
Special Warfare and Expeditionary Systems Department, Director*



**CAPT McKay, USN**  
**Commanding Officer**



**Dr. Kyle Werner**  
**Technical Director (Acting)**

Statement A: Approved for Public Release; Distribution is unlimited.

## QUICK FACTS

**\$1.4B**  
Business Base

**1 MISSION**

**3582**  
NSWC Crane  
Employees

**3 MISSION AREAS**



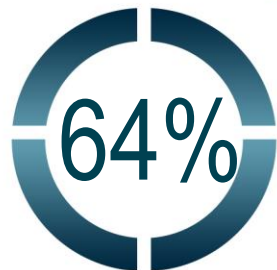
Strategic Missions



Expeditionary Warfare



Electronic Warfare



Scientists,  
Engineers,  
& Technicians

**117** Doctorate  
**628** Masters  
**1,657** Bachelors



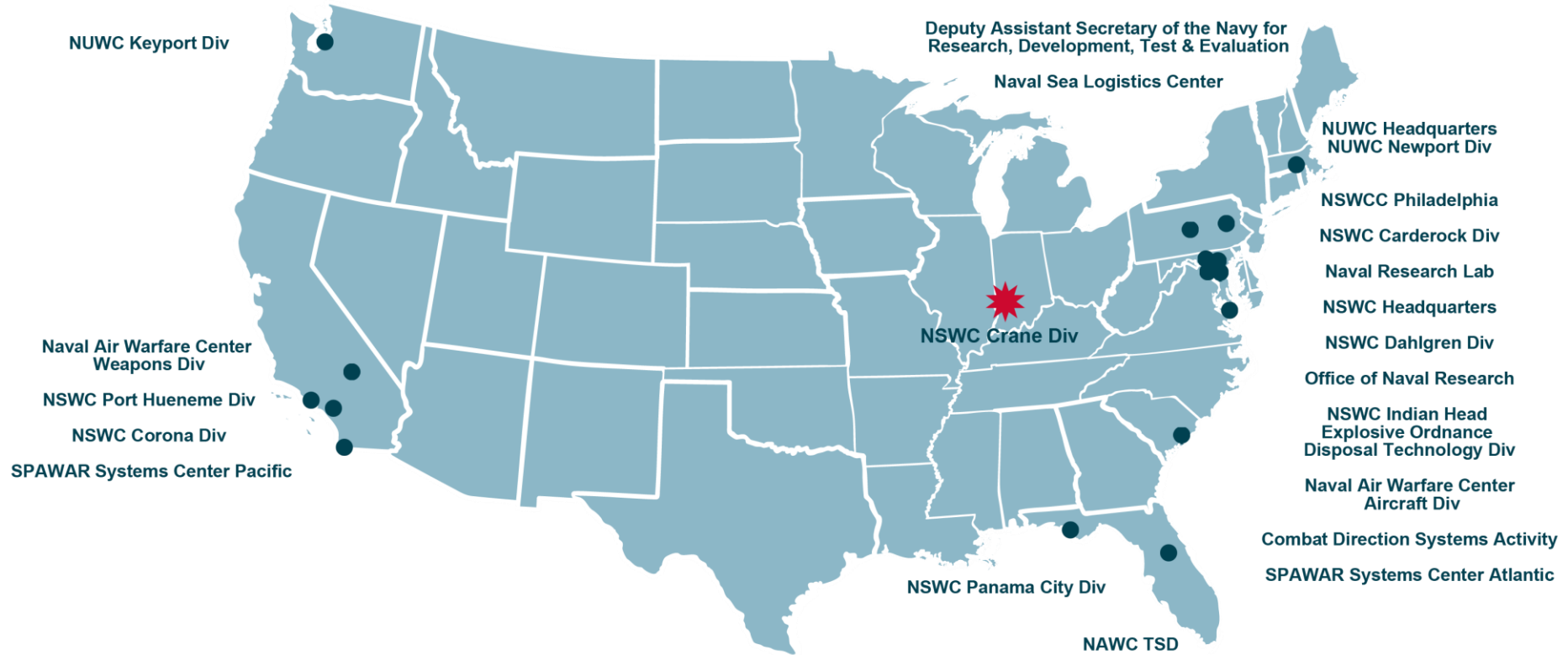
***Our Mission . . . Provide acquisition engineering, in-service engineering and technical support for SENSORS, ELECTRONICS, ELECTRONIC WARFARE and SPECIAL WARFARE WEAPONS. Apply component and system level product and industrial engineering to surface sensors, strategic systems, special warfare devices and electronic warfare/information operations systems. Execute other responsibilities as assigned by the Commander, Naval Surface Warfare Center.***

***Strategic Missions***

***Expeditionary Warfare***

***Electronic Warfare***

# Naval Research & Development Establishment



**Aggressive *RESEARCH, DEVELOPMENT, TEST & EVALUATION***  
**for Reliable Real World Solutions.**

# Expeditionary Warfighting Environment

“While we must accept an environment characterized by uncertainty, we cannot ignore strong signals of change nor be complacent when it comes to designing and preparing the force for the future”

General David H. Berger

**The coming decade will be characterized by conflict, crisis, and rapid change**



**We will build one force** – optimized for naval expeditionary warfare in contested spaces, purpose-built to facilitate sea denial and assured access in support of the Fleets.

We must divest of legacy capabilities that do not meet our future requirements, regardless of their past operational efficacy. There is no piece of equipment or major defense acquisition program that defines us –

not the AAV, ACV, LAV, M1A1, M777, AH-1, F/A-18, F-35, or any other program.

From the Commandant's Planning Guidance

## ExW THRUST AREAS

Sensor & Data Fusion

AI & Machine Learning

**CYBER**

Autonomous System Engagement

Sys of Sys T&E



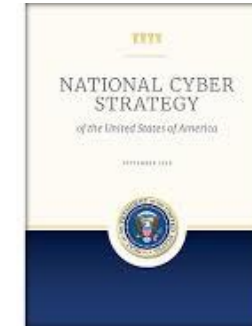
Individual Warfighter Cyber challenges are more difficult, largely due to the service ***being decentralized and spread across various offices, commands, military services, and military agencies.***



*Developing joint policy and guidance*

*Addressing cybersecurity threats*

*Operational functions to protect and defend its computer networks*



Current challenges revolve around DOD *ability to hire qualified Cyber experts and in the approach to identifying potential gaps* in its cyber posture and proactively defending against those threats



***Detect Intrusions***

***Analyze and Reverse Malware***



***Program in multiple languages***

***Think like a “black hat”***

***Perform Risk Analysis and Mitigation***

- **How we utilize it**
  - Familiarize interns with customers and systems/networks
  - Indoctrinate interns into the current security posture
  - Provide on the job training and practical application of skills being learned in the classroom.
- **Benefits to interns**
  - Familiarization with systems and networks in a real time setting.
  - Understanding of expectations regarding DoD Cyber policy and functions.
  - Direct exposure to Warfighter needs and helping solve “the tough problems”
- **Benefits to Crane**
  - Knowledgeable and qualified Cyber workforces through the practical application of skills in the learning and daily work environment.

- The security of every American is at risk from enemies we can't see, and often can't find, until the damage has been done. All facets of life are now in a "connected state" and those devices and networks are the target.
- The DoD at large is a target of malicious actors, whether they are common criminals, terrorist-affiliated hackers seeking soft targets to spread fear and violence, or foreign government-sponsored hackers engaged in espionage or disruption activities.
- ***Education, technology diversity and real-time application of a trusted and qualified workforce make up a firm cybersecurity foundation.***





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Randall Brooks  
Raytheon Technologies



# How to Build a Pirate Ship

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# Workforce Development



This opening talk discusses the concept of building a work environment targeted toward Hacker-focused Cybersecurity professionals.

We will just call them White Hat Hackers...or Pirates???



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# Aaarrrrr



What do we think of when we hear the word, “Pirate?”

- Fearless
- Independent
- Skilled
- Opportunistic
- Adventurous
- Murderous
- Nautical



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# Hackers as Pirates?



What do we think of when we hear the word, “Pirate?”

- Fearless
- Independent
- Skilled
- Opportunistic
- Adventuresome
- ~~• Murderous~~
- ~~• Nautical~~



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# What Makes Hackers Different?



## Values Shape Workplaces

- Recruiting and Development
- Work Environment
- Approach to Work
- Organization
- Rewards/Recognition



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# Misconceptions

MYTHS  
MYTHS  
MYTHS  
MYTHS  
FACTS

- Hackers are Criminals...
- Hackers are Cyberpunks...
- Aren't they all teenagers...
- All I need is some pizza and Mountain Dew...
- That will never work in my environment...
- I can't have my customer (boss/division chief/leadership team/token bigwig) see them...



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# Building a Pirate Ship



- Get the Best People
- Build the environment **they** want to work in
- Keep everyone productive and happy
- Know how hackers organize (and self-organize)
- Reward success with things they value



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# Get the Best People



- Understand the types of people you need
- Know how to recruit the top technical talent
- Know what hackers are looking for in a job
- Know the value of education and certifications
- Don't settle for second best



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# Build the environment they want to work in



- Space
- Gear
- Peers
- Perks / Soda and Snacks



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# Hacker Spaces



- Personal and collaborative space
- Demonstration (rather than meeting) oriented
- Lots of room
- Quiet/private when needed
- Function over appearance



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# Gear



Invest in best:

- Computers
- Monitors
- Software
- Gadgets / Toys



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# Peers and Perks



Hackers want to be with other hackers

- Technical respect for peers is biggest selling point
- Need to have work environment competitive with a Silicon Valley atmosphere
- Garage is your competitor
- Not everything is salary
- Free soda and energy bars, candy, etc.



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# Approach to Work



## Hackers love...

- Getting hands on
- Working short duration tasks
- Working multiple tasks at a time
- Working efficiently and productively

## Hackers hate...

- Slackers
- Repetitive tasks
- Meetings
- “Feeling lonely, hold a meeting...”
- Bureaucracy
- The term LT



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# Hackers and Organization



Doesn't come naturally...

- Independent streaks resist some management styles
- Some approaches (e.g. fear) just don't work
- I will take my ball and go home

Know your personalities

- Introverts/Extroverts
- Strong Egos
- Peer Leadership
- Shared Decision Making
- Managers who "get it"



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# Rewards and Recognition



## Different Recognition Types

- Looking for \$\$\$
- Looking for dough \$\$\$
- Looking for swag
- Looking for opportunity



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# Bio



Mr. Randall Brooks is a Principal Engineering Fellow for Raytheon Technologies (NYSE: RTX). He is the Director of the Raytheon Cyber Center of Excellence. Brooks represents the company within the U.S. International Committee for Information Technology Standards Cyber Security 1 (CS1) and the Cloud Security Alliance (CSA). He has more than 20 years of experience in Cybersecurity with a recognized expertise in software assurance (SwA) and secure development life cycles (SDLCs). In addition to holding eight patents, Mr. Brooks is a CISSP, CSSLP, ISSEP, ISSAP, ISSMP, and CCSK. He graduated from Purdue University with a Bachelor's of Science from the School of Computer Science.



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