

# NAVAL WARFARE SYSTEM ENGINEER





# A LIFE OF ADVENTURE

Embark on an engineering career unlike any other with the Republic of Singapore Navy. As a Naval Warfare System Engineer, you will play a vital role in protecting Singapore's waters and ensuring continued access to our sea lanes. With your engineering skills, our ships will remain operationally ready round the clock to safeguard Singapore's interests as a maritime nation.



# ENGINEERED

## FOR EVERY CHALLENGE

As a Naval Warfare System Engineer, you will lead your team in keeping our naval assets primed for action at all times, and apply your skills and deep engineering expertise to some of the world's most advanced naval technology, which includes warships, submarines, naval aircraft and weapon systems.

You will also be able to receive professional accreditation as an Incorporated or Chartered

Engineer from the Institute of Marine Engineering, Science and Technology (IMarEST) as part of your career development.

Choose a career that serves a bigger purpose, and rewards you with an extraordinary and meaningful experience.

Embark on a purposeful career as a Naval Warfare System Engineer.





# OUR PURPOSE

For centuries, maritime trade has been a key component of Singapore's economy and vital to its survival and prosperity. Given Singapore's strategic location, seaborne trade is the lifeblood of our economy and we rely on the sea to import valuable cargo and energy, and to export goods we manufacture. Our port is one of the busiest in the world and our offshore islands along the Singapore Strait host some of the world's largest oil refineries. Threats to Singapore's waters – the borders of a small island state measuring no more than 50km by 27km with no geographic depth – are also threats to the nation and Singaporeans' livelihoods. The sea is Singapore's lifeline, our link to the world and our first line of defence.



## The 4 key roles of our Navy



### Ensuring maritime security

The Singapore Strait is one of the busiest waterways in the world – every day, close to a thousand ships ply it. Given its proximity to the country's city centre and critical industries, it is crucial that the RSN ensures that maritime security is never compromised. The Navy maintains a 24/7 presence in Singapore waters, supported by surveillance and sense-making hubs ashore, and works closely with national and regional maritime agencies and navies to ensure that our seas are safe and secure for all.



### Enhancing diplomacy

The RSN contributes to the expansion of Singapore's policy space by making friends and sustaining strong relationships with fellow navies in the region and beyond. Building relationships with friends and partners improves trust and interoperability and makes it easier to tackle maritime concerns and security challenges together.



### Protecting our Sea Lines of Communication

Singapore sits astride the major sea lines of communication in the world. Cut off its access to them and Singapore will immediately be isolated. The RSN plays an important role in maintaining access to these sea lines of communication and deterring and dealing with threats to their closure.



### Securing our peace

In peace, the RSN has to hone and finesse its warfighting capabilities. It has to be ready at all times to answer the call of duty, and work with friends and partners to protect the seas, which are global commons. Should deterrence and diplomacy fail, the RSN will secure a swift and decisive victory for Singapore against any aggressor at sea.

# OUR ARSENAL OF ASSETS

Submarines, warships and naval aircraft are critical instruments of war, used to accomplish strategic, operational and tactical goals.

As a Naval Warfare System Engineer, you will be crucial in operating, maintaining and upgrading an array of state-of-the-art naval platforms and systems, and ensuring their readiness to respond to any eventualities that may occur in the complex and challenging maritime domain.

## FLEET



### **ENDURANCE-CLASS LANDING SHIP TANK**

Length: 141 metres  
Speed: In excess of 15 knots  
Displacement: 6,000 tonnes



### **FORMIDABLE-CLASS FRIGATE**

Length: 114 metres  
Speed: In excess of 25 knots  
Displacement: 3,200 tonnes



### **VICTORY-CLASS MISSILE CORVETTE**

Length: 62 metres  
Speed: In excess of 30 knots  
Displacement: 530 tonnes



# MARITIME SECURITY TASK FORCE



## ARCHER-CLASS SUBMARINE

Length: 60.5 metres  
Speed: 8 knots (surfaced),  
>15 knots (submerged)  
Displacement: 1,400 tonnes (surfaced),  
1,500 tonnes (submerged)



## CHALLENGER-CLASS SUBMARINE

Length: 51 metres  
Speed: 10 knots (surfaced),  
16 knots (submerged)  
Displacement: 1,130 tonnes (surfaced),  
1,200 tonnes (submerged)



## TYPE 218SG SUBMARINE

As part of our future development,  
the first Type 218SG Submarine  
will join our Navy in 2020.



## FEARLESS-CLASS PATROL VESSEL

Length: 55 metres Speed: In excess of 20 knots  
Displacement: 500 tonnes



## BEDOK-CLASS MINE COUNTER MEASURE VESSEL

Length: 47.5 metres Speed: In excess of 15 knots  
Displacement: 360 tonnes

## UNMANNED SYSTEMS



## PROTECTOR UNMANNED SURFACE VESSEL

Length: 9 metres  
Speed: Up to 30 knots  
Displacement: 5 tonnes



## SCANEAGLE UNMANNED AERIAL VEHICLE

Length: 1.2 metres  
Speed: About 53 – 55 knots  
Weight: About 20 kilograms



## INDEPENDENCE-CLASS LITTORAL MISSION VESSEL

Length: 80 metres  
Speed: In excess of 27 knots  
Displacement: 1,250 tonnes  
Eight Littoral Mission Vessels will be replacing our  
*Fearless*-class patrol vessels by 2020.



## SPECIALISED MARINE CRAFT

Length: 22 metres Speed: In excess of 30 knots  
Displacement: 40 tonnes

## AIRCRAFT



## FOKKER 50 MARITIME PATROL AIRCRAFT

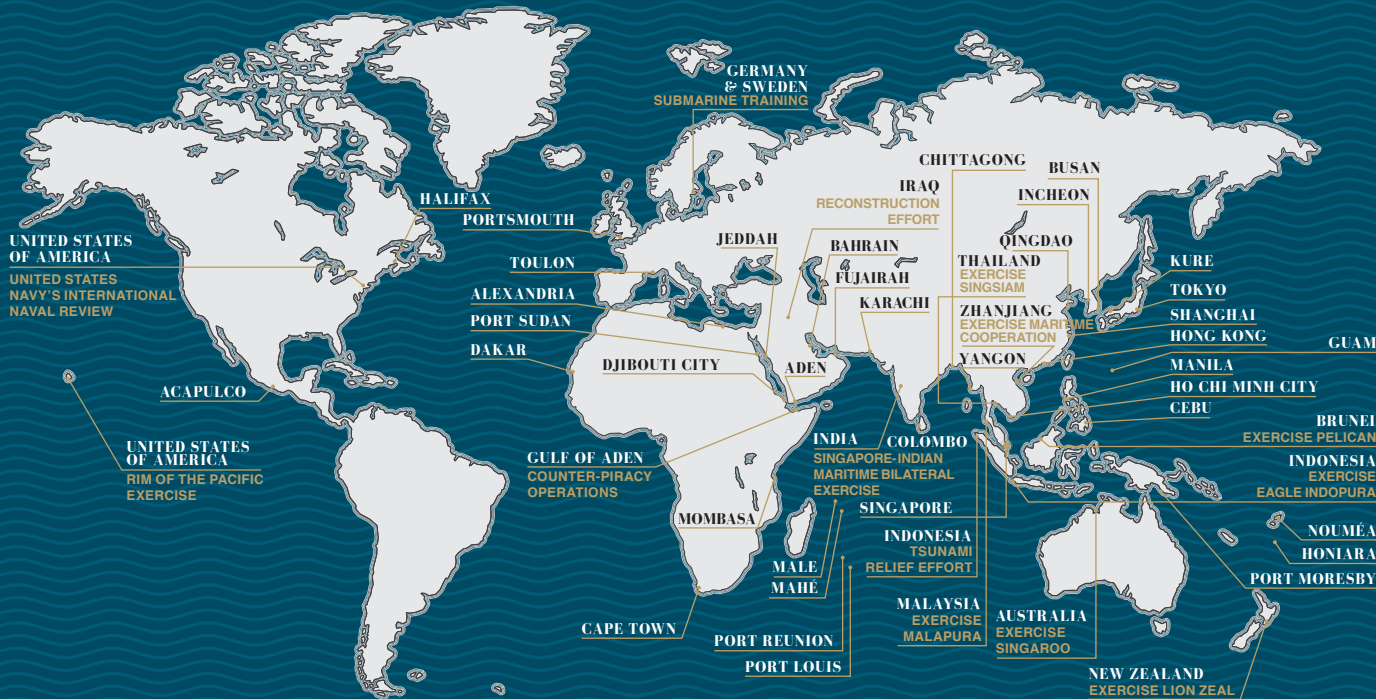
Length: 25 metres  
Speed: 220 knots  
Wingspan: 29 metres



## S-70B SEAHAWK

Length: 19.76 metres  
Speed: About 140 knots  
Weight: 9.6 tonnes

This map depicts our Navy's various ports of call, exercises and missions.



UNITED STATES OF AMERICA  
UNITED STATES NAVY'S INTERNATIONAL NAVAL REVIEW

UNITED STATES OF AMERICA  
RIM OF THE PACIFIC EXERCISE

GERMANY & SWEDEN  
SUBMARINE TRAINING

CHITTAGONG    BUSAN

IRAQ  
RECONSTRUCTION EFFORT

INCHEON

JEDDAH

QINGDAO

THAILAND EXERCISE SINGSIAM

KURE

TOLON

ALEXANDRIA

PORT SUDAN

DAKAR

DJIBOUTI CITY

BAHRAIN

FUJAIRAH

KARACHI

ADEN

ZHANJIANG EXERCISE MARITIME COOPERATION

YANGON

TOKYO

SHANGHAI

HONG KONG

GUAM

ACAPULCO

GULF OF ADEN  
COUNTER-PIRACY OPERATIONS

MOMBASA

INDIA

SINGAPORE-INDIAN MARITIME BILATERAL EXERCISE

COLOMBO

SINGAPORE

INDONESIA

TSUNAMI RELIEF EFFORT

BRUNEI EXERCISE PELICAN

INDONESIA EXERCISE

EAGLE INDOPURA

CAPE TOWN

PORT REUNION

PORT LOUIS

MALAYSIA EXERCISE MALAPURA

AUSTRALIA EXERCISE SINGAROO

NOUMEA

HONIARA

PORT MORESBY

NEW ZEALAND EXERCISE LION ZEAL



# YOUR MEANINGFUL JOURNEY >

As a Naval Warfare System Engineer, you will have the opportunity to travel around the world to participate in conferences, courses, as well as bilateral and multilateral exercises. You will also have the opportunity to pursue academic and professional upgrading in local and international institutions. Here are some of the overseas operations where you may be called upon to play a role in support of the international community.

# DRIVING OUR NAVY FORWARD

## MARINE ENGINEER

With your sharp mind and engineering expertise, you will be a driving force for innovative leaps in naval engineering. Your role will place you at the heart of sophisticated platforms, where you'll guide some of the brightest men and women in overseeing ship structure and survivability, by managing and operating marine systems, propulsion systems and electrical control systems.

### ACADEMIC QUALIFICATIONS

Degree in an Engineering discipline (e.g. Mechanical Engineering, Naval Architecture, Marine Engineering, Mechatronics or Aerospace Engineering)

### Starting salary

|   |  |                                    |
|---|--|------------------------------------|
| ME4 Trainee:<br>\$4,870 - \$6,190 (Degree)<br>\$3,050 - \$3,190 (Diploma)<br>\$2,840 ('A'-Levels) | ME4 (Apprentice):<br>\$4,870 - \$6,190 (Degree)<br>\$3,260 - \$3,330 (Diploma)<br>\$3,050 ('A'-Levels) | ME4:<br>\$5,320 - \$6,640 (Degree) |
|---|--|------------------------------------|

*Mid-careerists will be assigned a salary based on years of relevant experience and educational qualifications.*

### Additional allowances

Ship board: \$500  
Submarine: \$1,200

### Basic requirements

- Singapore citizens or permanent residents intending to take up citizenship
- Medically fit (PES B1 and above)
- Normal colour perception

*Salary range is subject to change. The actual starting salary will vary based on holistic assessment of the candidates' qualities, educational qualifications, completion of full-time National Service, relevant work experience, and military performance against the requirements of the jobs.*





# SPEARHEADING

## NAVAL COMBAT

### COMBAT SYSTEMS ENGINEER

Take charge of state-of-the-art combat systems ranging from missiles to radars, and in doing so, lead teams to keep our naval assets in top gear. Your expertise will steer our Navy towards greater breakthroughs in innovation, covering a wide spectrum of radar systems, command & control systems, communications, computers and IT (C4IT) systems, weapons, and weapon control systems.

|                                |  |  |                                    |
|--------------------------------|--|--|------------------------------------|
| <b>ACADEMIC QUALIFICATIONS</b> | Degree in an Engineering discipline (e.g. Electrical and Electronic Engineering, Computer Engineering or Mechatronics)   |  |                                    |
| <b>Starting salary</b>         | ME4 Trainee:<br>\$4,870 - \$6,190 (Degree)<br>\$3,050 - \$3,190 (Diploma)<br>\$2,840 ('A'-Levels)  | ME4 (Apprentice):<br>\$4,870 - \$6,190 (Degree)<br>\$3,260 - \$3,330 (Diploma)<br>\$3,050 ('A'-Levels) | ME4:<br>\$5,320 - \$6,640 (Degree) |
| <b>Additional allowances</b>   | <i>Mid-careerists will be assigned a salary based on years of relevant experience and educational qualifications.</i><br>Ship board: \$500<br>Submarine: \$1,200   |  |                                    |
| <b>Basic requirements</b>      | <ul style="list-style-type: none"><li>• Singapore citizens or permanent residents intending to take up citizenship</li><li>• Medically fit (PES B1 and above)</li><li>• Normal colour perception</li></ul> |  |                                    |

Salary range is subject to change. The actual starting salary will vary based on holistic assessment of the candidates' qualities, educational qualifications, completion of full-time National Service, relevant work experience, and military performance against the requirements of the jobs.

# DARE TO GO FURTHER

## NAVAL WARFARE SYSTEM ENGINEERS

### RANK

ME4



ME4

### APPOINTMENTS

- Lead Engineer, Marine Systems / Combat Systems (ship-based or shore-based appointment)
- Staff Officer / Section Head (e.g. Engineering, Systems Engineering, Military Logistics, Plans & Operations)

ME5 – ME6



ME5



ME6

- Squadron Commander
- Senior Branch Head (e.g. Engineering, Systems Engineering, Military Logistics, Plans & Operations)
- Commanding Officer of an Engineering Centre or Naval Engineering School
- Branch Head at Engineering Centre
- Senior Staff Officer (e.g. Engineering, Systems Engineering, Military Logistics, Plans & Operations)
- Senior Engineer, Marine Systems / Combat Systems (ship-based or shore-based appointment)
- Squadron Principal Engineer

ME7 – ME8



ME7



ME8

- Head Naval Logistics
- Commander Naval Logistics Command
- Group Head (e.g. Engineering, Systems Engineering, Military Logistics, Plans & Operations)
- Senior Principal Engineer (Domain & Systems)



# MASTER YOUR SPECIALITY

With our Navy, your career achievements will not go unnoticed. Improve your technical mastery while working on our naval systems and platforms, and earn badges which mark your skill development in different fields of expertise.

The ones featured here are vocational badges, which range from silver to gold to gold-with-star to recognise various milestones in your professional journey.



Engineers are silent heroes, working long hours in the machinery control room to ensure the ship is in peak condition. The compass rose on the engineers' badges reflects direction and symbolises the technical leadership at the heart of every engineer.

A career with the Navy ensures that your needs will be well taken care of under the Military Domain Experts Scheme (MDES) and the Flexible Benefits Scheme.

## MDES BENEFITS

Career until age 60 on full CPF terms

Expert Continuous Engagement & Learning (EXCEL) Bonus

28 months of MDES bonus in total,  
paid at 3 points in your career:

- age 32 – up to 12 months' bonus
- age 40 – 8 months' bonus
- age 50 – 8 months' bonus

## FLEXIBLE BENEFITS SCHEME

An annual lump sum allowance will be disbursed to you so that you have the flexibility in using the money as and when you need it.

Up to 10 years of service - \$800 per year

More than 10 years of service - \$1,000 per year

# SCHOLARSHIPS

Our Navy is a learning organisation. When you join us as a Naval Warfare System Engineer, we are prepared to offer both local and overseas scholarships to see you through your studies. With a scholarship, you will also lighten your family's financial burden of providing you with a university education as the tuition fees, accommodation, air tickets, and other approved charges will be paid for by our Navy while you continue to draw a full salary or allowance, depending on the scholarship awarded.

## SCHOLARSHIP

### SAF Engineering Scholarship

### SAF Engineering Academic Scholarship (Overseas/Local)

### SAF Engineering Award

### Mid-term SAF Engineering Award

## BENEFITS

- Full salary for the duration of overseas studies
- Full tuition fees and other approved academic charges
- Maintenance and other allowances, e.g. books, clothing, computer
- Return airfare

- Monthly salary for the duration of studies
- Full tuition fees and other approved academic charges
- Return airfare (For SEAS - Overseas)

- Annual allowance of \$14,200 during the course of your studies
- Full tuition fees and other approved academic charges

- Annual allowance, as well as sponsorship of tuition fees and other approved charges upon signing on
- Pro-rated lump sum back payment of tuition fees and annual allowance

## ELIGIBILITY CRITERIA

- Singapore citizens or permanent residents intending to take up citizenship
- Good GCE 'A' Level or International Baccalaureate results, Polytechnic Diploma (with Merit) or equivalent
- Good co-curricular activities (CCA) records and strong leadership qualities
- Qualify for and excel in Officer Cadet School
- Possess a strong interest in a military career

- Singapore citizens or permanent residents intending to take up citizenship
- Qualify for a place in a local university
- Good co-curricular activities (CCA) records and strong leadership qualities
- Qualify for and excel in Officer Cadet School
- Possess a strong interest in a military career
- For Mid-term SAF Engineering Award: good academic results for the first semester of study at current university

# OUR ENGINEERS IN THEIR WORDS



## MILITARY EXPERT 6 (ME6) VINCENT CHAN

Head Logistics Organisation and Plans Branch,  
Naval Logistics Department

I chose to join the Navy because I wanted to be part of the action at the frontline and apply my engineering knowledge on state-of-the-art naval systems.

Being awarded the SAF Engineering Scholarship (SES) provided me with a valuable opportunity to study in the United Kingdom. Studying overseas taught me independence and strengthened my ability to adapt to changing environments, both of which have helped me immensely in my career.

My experience with the Navy has been an enriching one. I have served as the pioneer underwater engineer on board the *Formidable*-class frigates, Honorary Aide-de-Camp (ADC) to the late President Nathan and Commanding Officer of Systems Readiness Engineering Centre (Weapons). However, the one I recall fondly was the experience of being deployed for counter-piracy operations in the Gulf of Aden in 2012, where I saw first-hand how our Navy contributed to a safer and more secure passage for international shipping.

A career in the Navy got me into the thick of action, where I worked with and led groups who started out as strangers, but grew to become great teams and friends. Joining the Navy is the first step to a lifetime of adventure with the tightest bunch of people that you know you can count on, and the challenges faced together are only opportunities to grow and be the best that we can be.

## MILITARY EXPERT 4 (ME4) SOH MIAO HUI

Lead Engineer, Submarine and Systems Branch,  
Naval Logistics Command

Growing up, I have always been interested in ships. Therefore, joining the RSN came as a natural choice after getting my degree in Naval Architecture, and I have never looked back since.

As an engineer in the Navy, we ensure that our naval assets are primed for action at all times. As the Lead Engineer in the Submarine and Systems branch, I ensure that the submarines' systems are well maintained. I take pride in knowing that I am contributing and playing my part to safeguard Singapore's maritime interests.

Throughout my career in the Navy, I have met many like-minded servicewomen, many of whom have helped to shape me into who I am today. I hope to inspire more females in the same manner as I mature and grow in my profession.

The truth is that a career in the Navy is not easy, but it is fulfilling for ladies who want a challenging and exhilarating career. For female graduates who are independent and have the interest to serve, embark on a journey to widen your horizons with the Navy.



## MILITARY EXPERT 4 (ME4) RAMASAMY

Senior Marine Engineer, RSS *Formidable*  
(*Formidable*-class Frigate)

I joined the Navy because the job does not put me permanently behind the desk on a 9-to-5 routine, and provides me with opportunities to travel overseas and see the world. I have served on both the *Endurance*-class Landing Ship Tank and the *Formidable*-class Frigate, which have taken me on a multitude of deployments and exercises overseas. Some examples include the Singapore India Maritime Bilateral Exercise (SIMBEX) with the Indian Navy and Exercise Malapura with the Royal Malaysian Navy.

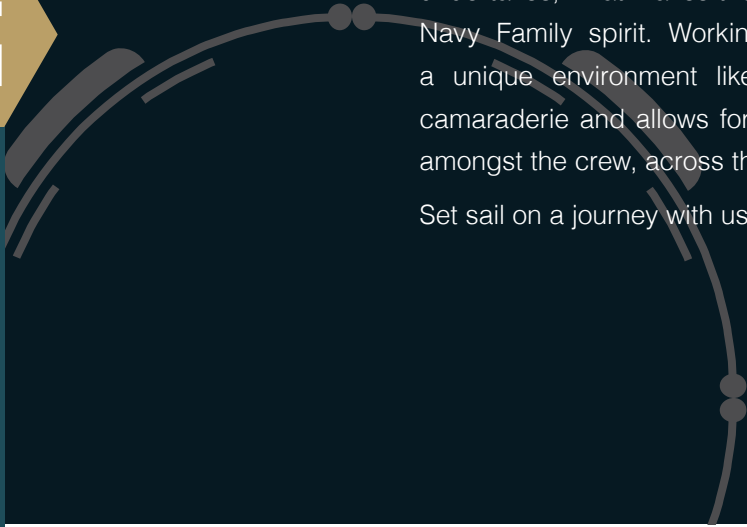
The interesting parts of being an engineer in the Navy lies in the opportunity to serve beyond a technical role, and also being able to contribute to building relationships with other like-minded nations. Diplomacy is an important cornerstone for Singapore's survivability as a small nation, and I am grateful for the chance to do my part for Singapore.

The Navy also takes pride in growing our engineers professionally. Recently, I was given the opportunity to attend the Systems Engineering & Management Course (Marine Engineering) in the United Kingdom.

A career as an engineer in the Navy is exciting, but challenging. Be prepared to work hard, and embrace changes. Adopt the right attitude and I am certain you will enjoy your career in the Navy as much as I do.




# WE ARE THE NAVY FAMILY



Beyond the various operations and exercises that the RSN undertakes, what makes the RSN so special is its closely-knit Navy Family spirit. Working and living together on board a unique environment like our ships forges a sense of camaraderie and allows for lasting ties of kinship to be built amongst the crew, across the ranks.

Set sail on a journey with us and be part of our Navy Family.





[www.navycareers.gov.sg](http://www.navycareers.gov.sg)

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