Issue 41 Spring 2026

Line of Defence

New Zealand's Defence and National Security Magazine



Rob Krushka: Headquarters Joint Forces New Zealand turns 25

Fred Wilson: Three frigates is the only sensible benchmark for RNZN

Josh Wineera: Mission command in the age of autonomous teaming

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EDITOR'S NOTE

Kia ora and welcome to the Spring 2026 edition and 41st issue of Line of Defence.

The debate over the relative merits of the Babcock Type 31 and the upgraded Mogami-class as contenders in the two-horse race to replace New Zealand's Anzac-class frigates has, in recent weeks, gotten heated. In this issue of Line of Defence, we feature the latest round.

In an article that's already elicited a flurry of comments since it was posted online last week, distinguished guest contributor and former Chief of Naval Staff Rear Admiral Fred Wilson (Retd), writes that three frigates is the only sensible benchmark, and a comparative assessment suggests Mogami over the Type 31.

In a wide-ranging assessment that rebukes the idea of frigates as 'exquisite' platforms and warns against "multi-role by containerisation", RADM Wilson delivers a head-to-head comparison of the Mogami and Type 31 options that isn't for the faint hearted.

Taking something more of a flanking approach, senior contributor CAPT Andy Watts (Retd), argues that the Type 31 and upgraded Mogami are answers to different questions. "In deciding whether Mogami or Type 31 is best suited to our maritime combat requirements," writes CAPT Watts, "we first have to decide on the nature of the geostrategic environment in which we must live and operate, and what our Navy must therefore be able to do."

For senior contributor Dr Wayne Mapp, the frigate decision will come down to ideology. With major decisions on the naval fleet replacement unlikely until late 2027, writes Dr Mapp, choices will be dependent on who wins the upcoming election.

"Lightly armed ships would go some way to meeting the requirements of Labour's likely coalition partners, given their view that the primary purpose of defence is peacekeeping, HADR, and environmental monitoring within the South Pacific," he writes. Does this mean the Type 31 might be the more likely outcome under a Labour-led government?

The other major theme of this edition is autonomous technologies and human-autonomous teaming, with editorial contributions from Josh Wineera, Derek Tunui, Andy Watts, and Lawrence Fuller.

In their co-authored piece, Wineera and Tunui write that Militaries need to prepare their leaders for environments in which humans are no longer the only source of cognition, while in another article, Wineera writes that in the age of human-autonomous teaming, human commanders will become more – not less – important. In an article informed by psychological, organisational and military theory, Lawrence Fuller explores what's needed for real intellectual adaptation to UxS adoption.

Among the several other excellent contributions, we are privileged to feature an exclusive interview with Commander Joint Forces New Zealand MAJGEN Rob Krushka reflecting on the recent 25th anniversary of HQJFNZ. In a sweeping treatise on the first quarter century of the HQ, MAJGEN Krushka catalogues the ingredients for its success, its highlights, and how it is evolving to meet the requirements of contemporary deployments and the changing nature of conflict.

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COVER IMAGE



UPCOMING ISSUE

SUMMER	September 2026
Main themes:	Maritime domain, maritime security, HADR, civil-military
Copy Deadline:	01 December 2026
Publication:	10 December 2026

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ISSN 2463-6258 (Online)

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The future Navy won't be crewed or uncrewed. It will be integrated.

New Zealand has signalled its intent to invest in autonomous systems. The question now is how we turn that investment into an enduring military capability, writes Clinton Williams, Director - Serco New Zealand.

Globally, navies are already experimenting with, deploying and learning from autonomous systems. The question now is how to integrate them into existing forces in a way that delivers a genuine operational advantage.

For New Zealand, that question is becoming increasingly relevant.

The 2025 Defence Capability Plan identifies persistent surface surveillance using uncrewed autonomous vessels as one of New Zealand's major near-term investments. These systems could operate independently for extended periods or alongside crewed ships, increasing maritime domain awareness across the vast area in which the New Zealand Defence Force (NZDF) operates.

For a relatively small Navy with responsibilities stretching from Antarctica to the equator, autonomy could help address some very practical constraints. Persistent autonomous systems could extend the reach of the fleet, maintain surveillance in areas where keeping a ship permanently on station would be impractical, and allow scarce crewed platforms to be concentrated where their capabilities and people are genuinely required.

There is, however, an important difference between acquiring autonomous vessels and creating an autonomous capability.

We need to think beyond the platform

Much of the conversation around maritime autonomy naturally gravitates towards the vessel itself.

How far can it travel? How long can it remain at sea?

What sensors can it carry? How autonomous is it?

These are all reasonable questions. But a highly capable autonomous vessel operating largely in isolation from the rest of the force has limited utility.

Its real value comes from what it contributes to the wider system.

Can information collected by an uncrewed vessel feed into the same operational picture used by



The NOMARS program's prototype vessel, USX-1 Defiant. © DARPA

ships, aircraft and headquarters? Can its sensors and payloads be changed as requirements evolve? Can it communicate securely with other NZDF and allied systems? Can software be upgraded without replacing the underlying platform? And can New Zealand develop the local capability needed to maintain, modify and sustain it throughout its life?

There is also a more fundamental operational question: does the introduction of autonomy allow the force we already have to achieve more?

In the Defence Capability Plan, persistent uncrewed surveillance is envisaged as complementary to traditional ships and aircraft, rather than a replacement for them. That is an important way to think about what comes next.

Integration is critical, and it may be the harder problem.

As maritime autonomy scales, navies will need to work through five key challenges: regulation, new support and home-port models, procurement processes able to keep pace with rapidly changing technology, the people and skills required to operate autonomous fleets, and compatibility with ships already in service.

What should sovereign capability mean?

There is an industrial question sitting alongside the operational one.

New Zealand's Strategic Industrial Base Statement for Uncrewed Systems and Uncrewed Counter Systems sets out an ambition to strengthen sovereign capability in this sector.

New Zealand operates within global defence and technology supply chains and will continue to do so. There will always be areas where established international suppliers are best-placed to provide technology, experience or scale.

The more pertinent question is what New Zealand needs to be able to do for itself.



Serco's Clinton Williams (right) beside former New Zealand Minister of Defence, the Hon Judith Collins KC (centre), and RADM Mat Williams, VCDF (right) at the NZDIA Uncrewed Capability Showcase 2026

The Industrial Base Statement provides useful direction. It emphasises modular and open architectures, domestic integration, and resilient supply chains. It also identifies opportunities for New Zealand industry well beyond the manufacture of platforms, including sensors and payloads, data fusion, command and control, training, integration and sustainment.

This gets closer to what sovereign capability should mean in practice.

Sovereign capability isn't necessarily about designing every component ourselves. It is about retaining the ability to build, integrate, sustain and evolve capability ourselves.

If operational requirements change, can we integrate a different sensor? If a New Zealand company develops a better payload, can we put it onto an existing platform? Can software and autonomy be improved over time? Can we repair and sustain the system locally? Can we change parts of the capability without having to return to the original overseas manufacturer every time?

Those questions become increasingly important when the useful life of a platform may be measured in decades, while the software, sensors and mission systems operating on it could change many times during that period.

International partners can bring significant benefits to building sovereign capability

Serco has been leading innovation in maritime autonomy for some time. Our work designing, developing and building the



It's a new era – Serco

USX-1 *Defiant* for the Defense Advanced Research Projects Agency (DARPA) in the US provides experience at the leading edge of large autonomous vessel development and operation.

We are now able to bring that experience to New Zealand, with localisation and integration that delivers real operational advantage front of mind.

A proven international vessel design, for example, could be licensed and adapted for construction in New Zealand, drawing on local naval architecture, engineering and shipbuilding capability. Some major systems and components may still need to come from specialist international suppliers, particularly where there is no realistic domestic alternative at present, but this does not prevent New Zealand from developing meaningful sovereign capability. It changes where we need to focus our effort.

Where suitable New Zealand-developed sensors, payloads, software or other systems exist, they can be integrated into the platform. Where specialist international systems are required, we can build the local technical knowledge, supplier relationships and support arrangements needed to sustain them here. The vessel itself can be built, integrated, operated, maintained and evolved in New Zealand.

Global experience should not substitute for New Zealand capability. It should help us build more of it.

Designing for a capability that will keep changing

One thing we can be reasonably confident about is that the autonomous system we acquire today will not remain unchanged for the next ten years.

The vessel itself might remain largely the same, but sensors will improve. Software will evolve. Artificial intelligence will mature. Communications architectures will change, as will the threats those systems are expected to detect and respond to.

That puts a lot of weight on some of the decisions made early in acquisition.

If the architecture is open and modular, New Zealand retains options. We can integrate new technologies, change payloads and adapt the capability as operational needs develop. If it is closed and heavily dependent on a single supplier, those options narrow considerably.

So perhaps the ambition shouldn't simply be to acquire the best autonomous vessel available when the procurement decision is made.

We should also be thinking about what will allow New Zealand to continue improving that system five, ten or fifteen years afterwards.

That requires more than technology. It requires the right architecture, relationships with industry, technical skills, operational concepts and local sustainment capability. Some of those things will take longer to develop than the vessel itself.

Ultimately, the future of Navy won't be defined by whether there is someone standing on the bridge of every vessel.

It will be defined by how effectively the whole force works together.

RNZAF supports hi-tech partners during F-35 exercise

The first deployment of two Royal Australian Air Force F-35A Lightning II aircraft to New Zealand during Exercise Agile Tasman has highlighted the close trans-Tasman defence partnership.

The Royal New Zealand Air Force (RNZAF) and New Zealand Army have trained alongside the RAAF, integrating RAAF F-35As, C-130J and RNZAF P-8A Poseidon aircraft, as well as Joint Terminal Attack Controller (JTAC) personnel in a series of training activities at RNZAF Base Ohakea and Waiouru Military Training Area this week.

The Chief of Air Force, Air Vice-Marshal Darryn Webb, said the exercise was an opportunity to practise with Australia to project capabilities in the Pacific.

"Our responsibility to enhance the security and prosperity of our region is best done by Australia and New Zealand and many other nations working together. And to do that effectively, it simply takes practice."

Training objectives included exercising an RAAF Forward Arming and Refuelling Point (FARP) outside Australia for the first time, delivery of high explosive ordnance into the Waiouru Military Training Area and intercept training with the RNZAF P-8A.

The Commanding Officer of No. 3 Squadron RAAF, Wing Commander Mark Biele, said it was wonderful to be in New Zealand and operating together, reinforcing the Anzac spirit, especially when the squadron was celebrating 110 years since its founding.

"It's our 110th birthday while we are here, and who would we want to spend that with other than our best mates across the Tasman?"

The main tasks of the exercises included the two F-35As flying from RAAF Base Williamstown to New Zealand, supported by a RAAF KC-30 air-to-air refueller, and then entering the Waiouru skies to execute a coordinated time-on-target strike employing two GBU-54 precision-guided bombs, which were GPS target designated into the training area under the control of JTAC's.

After the jets landed at Base Ohakea, they were refuelled from the tanks of a C-130J and rearmed. The FARP demonstrated the ability to rapidly refuel and rearm aircraft, increasing operational reach, resilience and mission tempo in remote or austere environments.

On the third day of the exercise, RNZAF No. 5 Squadron and its P-8As got involved with the jets conducting intercept training. Intercept training is a practice where military fighter jets learn to find, approach, identify and escort other aircraft in flight.

A team of 67 RAAF personnel, including aircrew, maintenance, security forces and refuellers travelled to Base Ohakea, working alongside about 32 RNZAF personnel including aviation rescue firefighters, security forces personnel, refuellers and aircrews from No. 40 and No. 5 Squadrons.

Led by the RAAF, and hosted by the RNZAF, the exercise has laid a platform for future training with enhanced interchangeability of personnel and aircraft between New Zealand and Australia.







The RAAF F-35A jets approaching Waiouru, NZ Army JTAC personnel identifying on approach and the ordnance being detonated. Image courtesy RNZAF.

Advancements in Satellite Communications Are Making MQ-9B More Resilient Than Ever

In today's rapidly evolving security environment, operating with precision, persistence, and reliability is paramount.

Nowhere is this truer than in the Pacific, where vast expanses of ocean and remote islands make satellite communications the only viable lifeline to friendly forces.

The MQ-9B SeaGuardian®, developed by General Atomics Aeronautical Systems, Inc. (GA-ASI), is a game-changing platform built on decades of experience using satellite data links for command and control, sensor data transmission, and automated takeoff and landing.

Emerging satellite technology now makes these communications more resilient than ever, ensuring MQ-9B can operate effectively across the most remote or contested environments.

Last year, GA-ASI demonstrated this new capability by flying its Gray Eagle® aircraft via a Proliferated Low Earth Orbit (pLEO) satellite constellation.

Now integrated into the MQ-9B, this technology significantly enhances the platform's ability to maintain secure, reliable links. As the U.S. Department of Defense continues building out its Link 16-enabled pLEO constellation — the Proliferated Warfighter Space Architecture — the MQ-9B will connect to allied operations like never before.

This makes the MQ-9B an ideal fit for New Zealand's demanding security requirements. The country needs an aircraft with unparalleled endurance to patrol enormous swathes of the Pacific Ocean, protect critical resources and fisheries, prevent transnational crime, and deter potential adversaries from encroaching on its sovereignty.



The multi-mission MQ-9B is the longest-endurance uncrewed platform in its class

MQ-9B SeaGuardian is tailor-made for these and other missions.

The Role of pLEO in Enhancing Resilience

pLEO satellite constellations are transforming modern military communications.

Unlike traditional geostationary satellites orbiting at approximately 36,000 kilometers, pLEO satellites operate at much lower altitudes — typically between 500 and 2,000 kilometers. This proximity reduces latency, increases data transmission speeds, and delivers comprehensive global coverage.

A major advantage of pLEO constellations is their inherent jam resistance.

Traditional geostationary systems are vulnerable to interference because they rely on a small number of high-value assets in fixed positions.

By contrast, pLEO constellations comprise hundreds or thousands of smaller satellites in constant motion. This distributed architecture makes it far more difficult for adversaries to disrupt communications, allowing the MQ-9B to maintain stable connectivity in contested operational zones.

pLEO networks also cover the entire globe, meaning MQ-9B can go anywhere, pole to pole.

Furthermore, the MQ-9B was engineered to meet stringent U.S. Department of Defense cybersecurity standards, ensuring data is safeguarded at every level.



GA-ASI's MQ-9B successfully completed its first validation test flight with AEW&C pods on May 19, 2026

Paired with pLEO's physical resilience, the aircraft benefits from a dual layer of protection: advanced cybersecurity protocols backed by a distributed, interference-resistant network.

For the MQ-9B, this dual-layer approach provides critical stability during high-stakes missions.

Whether navigating GPS-degraded environments or contested airspace, the aircraft's ability to maintain uninterrupted command and control acts as a true force multiplier — a vital capability across the vast distances of the Pacific.

Meeting New Zealand's Security Needs

The MQ-9B SeaGuardian is uniquely tailored to address New Zealand's diverse security challenges, delivering comprehensive maritime domain awareness.



Whether paired with other assets or on its own, the all-weather MQ-9B is well-suited for New Zealand's multi-domain ISR requirements

With an endurance exceeding 30 hours in select configurations, the aircraft provides persistent intelligence, surveillance, and reconnaissance across vast domains.

Its modular payload architecture supports advanced sensors, including a 360-degree maritime radar, an automatic identification system, and available anti-submarine warfare suites.

By loitering for extended periods and synthesizing complex sensor data into actionable intelligence, the MQ-9B enables New Zealand to safeguard its resources and respond rapidly to emerging threats.

Additionally, civil airspace certification allows the aircraft to operate seamlessly in peacetime missions, such as disaster relief and environmental monitoring, without disrupting standard airspace operations.

A Proven Platform With a Bright Future

The MQ-9B is a field-proven platform backed by a legacy of operational success.

Derived from a design heritage with more than 9 million flight hours, the MQ-9B delivers a generational leap in capabilities at a fraction of the cost of a clean-sheet program. Its advanced ground control stations and intuitive user interfaces give crews a clear operational picture, enabling rapid decision-making in complex environments.

GA-ASI's commitment to continuous innovation ensures the MQ-9B remains at the forefront of unmanned aerial systems.

Planned integrations — such as long-range standoff weapons and airborne early warning capabilities — will further expand its utility in high-threat environments.

Combined with the resilience of pLEO satellite constellations, these advancements position the MQ-9B as a trusted solution for modern defence and security challenges.

Naval Combat Capability: Reflections on choice

The Babcock Type 31 and upgraded Mogami are answers to different questions, writes Andy Watts. It depends on the mission.



Senior Contributor CAPT Andy Watts RNZN (Retd) is Maritime Defence Capability Consultant, AUSTAL. He was previously Deputy Executive Director, Australian Civil Military Centre, and an RNZN officer for over 30 years.

In a well-argued piece in the Winter 2026 edition of Line of Defence, Rear Admiral Jim Gilmour (Ret) offers a comparison between the two options for the combat element of the Maritime Fleet Renewal program announced by the Minister of Defence earlier this year – the Japanese Mogami class and the British Type 31 frigates.

Mogami has been selected by the Australian government to replace existing, soon to be life expired Anzac class frigates, and Type 31 is under construction for the British Royal Navy. Both options create opportunities for partnerships with the Royal Australian and Royal Navies in workforce development, supply chain sustainment, doctrine development, and technology insertion over time.

For a small navy seeking to manage these aspects of capability in an era in which societal, geo-political and technological stability is a thing of the past, such partnerships are very important in navigating complex organisational challenges.

I underwent my primary professional training and higher defence education in Australia, and served alongside ADF naval, air, and land forces throughout my career. I had less direct but still substantial contact with the Royal Navy – enough to develop a deep respect for our UK counterparts and enduring friendships with Royal Navy people.

Although my background pre-disposes me towards partnership with Australia (please note that I am currently employed as a consultant to an Australian company, Austal Ships Ltd), I recognise that the Royal Navy's organisational depth and the historical goodwill that exists between our two navies would make such a partnership worthwhile.

Acquiring Mogami class frigates in partnership with the ADF or Type 31 frigates in partnership with the Royal Navy would provide a sound platform for the long-term management of the many complex organisational challenges facing the RNZN. However, in his article, Jim assets that Mogami is only marginally superior to Type 31 in capability. I must respectfully take issue with this point.

The first point to make is that Mogami and Type 31 are answers to different questions. Type 31 was conceived as a means of maintaining Royal Navy surface combatant fleet numbers in the face of escalating costs in advanced programs, particularly the Type 26 frigate. It was intended from the outset to perform "maritime security" missions, which are defined in the UK National Strategy for Maritime Security "...in terms of upholding laws, regulations, and norms to deliver a free, fair, and open maritime domain...".

Accepting that this definition is open to wide interpretation, it uses language more commonly associated with what is termed the maintenance of good order at sea as opposed to the deterrence of state actor aggression. By adopting this definition as the basis for its requirement, the Royal Navy was able to specify a



The Royal Danish Navy frigate KDM Niels Juel, an Iver Huitfeld air defence frigate. Image: US Navy.

performance baseline that kept unit procurements costs to a very low GBP250M (not including a range of Government Furnished Equipment (GFE)), allowing sufficient numbers to be acquired to bring overall fleet numbers to a sustainable level.

In 2019, the UK MoD selected a design offered by Babcock Ltd based on the Danish Iver Huitfeld air defence frigate for its Type 31 requirement. From a professional naval perspective, there is much to like about these ships. For one thing, they are large – nearly 140m in length at a displacement of nearly 6,000 tonnes, against the RNZN Anzac class at 118m and 3,600 tonnes.

Size confers many advantages, including seakeeping ability, range, and maintainability (systems are easier to "get at" for maintenance and component replacement). Greater stability means that crewed and autonomous aircraft and surface and sub surface vehicles can be operated safely in higher sea states, and wear and tear on equipment and people is much reduced. Downstream modification for new capabilities is also much easier for a large ship than a small one.

However, the same size advantage applies to the upgraded Mogami (which is the version in contention for the NZ requirement), which is 142m in length at 6,200 tonnes displacement. In addition, Mogami has been designed from the keel up to accommodate a specific range of platform and mission systems without precluding future upgrades or system replacement. Design philosophy extends beyond the integration of these systems – they are designed as a single, coherent capability.

T31, on the other hand, is specifically designed to accommodate a range of systems according to customer requirements – systems fits across the T31 parent design and the Polish and Indonesian export variants vary widely. By definition, T31 cannot be as space and weight efficient or as ergonomically laid out as Mogami.

I have advocated for a modular approach to capability in many articles in this publication and elsewhere, and I won't repeat those arguments here. However, I respectfully take issue with Jim's assertion that Type 31 is a modular design. It is a traditional design in which most of the mission systems are tightly coupled with the platform, but with sufficient design flexibility to allow space and weight for modular systems. At some point in the life of these ships, an expensive upgrade of those mission systems that are coupled to the platform will be required.

Type 31 obsolescence can't be wholly managed by exchanging a new module for an obsolescent one. The cost and schedule risk associated with such upgrades was amply illustrated during the Anzac Frigate Systems Upgrade project.

Jim and others will rightly argue that the same limitation with regard to the upgrade of primary mission systems applies to the Mogami class. He also asserts, however, that Mogami has "...very limited ability to embark personnel beyond the crew, severely limited training capacity, limited space for uncrewed systems, disaster relief stores, mission bays and little growth margin allows for very limited capability breadth beyond its combat functions...".

The Mogami class in its basic configuration requires a complement of 92, against 110 for the Type 31. A complement of 18 fewer sailors per

ship (compared to Type 31) has great advantages in relation to workforce management. The total number of bunks available is 127, 35 more than are needed for the core complement, allowing a significant margin for embarked trainees and military forces.

Notwithstanding its traditional frigate configuration, Mogami is specifically designed as an autonomous system mother ship. Mogami is one of the first frigate types to embark both an Uncrewed Underwater Vehicle (UUV) and an Uncrewed Surface Vessel (USV) as standard elements of its mission system, not as ad-hoc additions.

The design incorporates a stern ramp and mission bay under the flight deck for launch and recovery of these craft, while a full-size flight deck and hangar support an H-60 series helicopter (such as the recently ordered MH-60R) and, potentially, unmanned air systems. The mission bay can also be used to accommodate other mission modules and equipment, including disaster relief stores.

Jim asserts that Mogami only offers a marginal increase in combat capability in comparison to Type 31. I disagree. Firstly, Type 31 in its Royal Navy configuration has no anti-submarine sensors and shipboard weapons. In my view, ant-submarine capability is central to frigate combat capability. Submarines are proliferating in the Asia-Pacific region and present a very real threat to the free movement of goods and people across the oceans and information flows through undersea cables.

Providing Type 31 with a towed active/passive sonar and adding the necessary code to the Combat Management System would create an expensive acquisition and integration problem for New Zealand, together with a training and maintenance burden that could not be shared with the Royal Navy.

In addition to its comprehensive anti-submarine capability, Mogami is fitted with the OPY-2 Active Electronically Scanned Array (AESA) radar using planar arrays with fixed 360-degree coverage. It is thus better able to defeat the saturation missile attacks that could easily become a feature of operations in our area of primary strategic interest than Type 31, which is fitted with a rotating Thales NS110 surveillance radar. The latter is no doubt an excellent system, but most authorities seem to agree that in installations where their weight and power demands can be accommodated, fixed arrays offer superior coverage and effectiveness.

There are other significant differences between the two ships. T31 features a 57mm main gun – very useful for self-defence, but ineffective for fire support to land forces. Mogami is fitted with the BAE Systems Mark 45 Mod 4 five inch (127mm) medium gun, which can fire extended range guided munitions. The latter enables greater compliance with the law of armed conflict principles of distinction and proportionality, in that targets can be engaged with much greater precision than with unguided rounds, allowing the necessary effect to be achieved at a much lower risk of collateral damage.



BAE Systems Mark 45 Mod 4 five inch medium gun. Image: BAE Systems.



A Mitsubishi OZZ-5 UUV. Image: Mitsubishi.

Adopting T31 in the Royal Navy configuration would mean the RNZN is no longer capable of providing fire support to land forces operating in the littoral. In the event of serious conflict, this could cost lives.

Another significant Mogami capability is its hull-mounted mine hunting sonar and OZZ-5 mine hunting UUV. Uniquely for a frigate, Mogami can hunt for and dispose of maritime mines – a capability hitherto limited to dedicated, highly expensive mine countermeasures vessels.

Mines were the only direct military threat faced by New Zealand during WW2; the minesweeper HMNZS Puriri was sunk by a mine with tragic loss of life while conducting sweeping operations off the Northland coast in 1941. Notwithstanding the superb efforts of RNZN operational diving, mine clearance, and hydrographic specialists over many years, our mine countermeasures capability is wholly unequal to the potential mine threat. Mogami could reduce this gap.

Finally, the Mogami class OYQ-1 Combat Management System (CMS) and Combat Information Centre (CIC) are amongst the most advanced in the world. A warship's CMS is both its software-driven brain (with the ultimate cognitive element reserved for humans) and its central nervous system. It collects and synthesises information from the ship's own sensors with that received externally via data link, presents that information to the ship's operators, and controls the ship's weapon systems. The CIC is the space in which humans interact with the CMS.

The Mogami CMS/CIC features a 360-degree augmented reality screen projection which provides operators and Commanding Officers with a level of situational awareness unmatched by any comparable system.

To return to my main point, Type 31 and Mogami are answers to different questions. Type 31 is a good ship and partnership with the Royal Navy will deliver a wide range of organisational benefits, but it is intended for maritime security functions and does not have the combat capability needed for New Zealand to add weight to the deterrent effect needed to avoid conflict in our region.

Mogami, however, is designed explicitly for combat, while retaining mission flexibility comparable to Type 31 through its basic design, autonomous vehicle, and mission bay capability. Partnership with the Royal Australian Navy would deliver benefits at least comparable to partnership with the Royal Navy, with the added advantage of geographic proximity.

In deciding whether Mogami or Type 31 is best suited to our maritime combat requirements, we first have to decide on the nature of the geostrategic environment in which we must live and operate, and what our Navy must therefore be able to do. Does it require the ability to contribute to good order at sea with maritime security level capability, or should it have the ability to contribute to the deterrent effect needed to avoid a tragic miscalculation leading to actual combat at sea? If the former, Type 31 is a good choice. If the latter, Mogami is a better choice.

As indicated above and in my other public writings since my engagement as an advisor by Austal, I cannot claim to be a disinterested party in this debate. However, I have tried to avoid partisanship as much as possible. There have been some excellent contributions to the discussion of late, including a paper by Major General John Howard (Retired) published by The New Zealand Initiative, and Line of Defence articles by Jim Gilmour, Graeme Doull, Marc Parsons, and others.

In my view all these contributions have added great value, notwithstanding any differences I have had with content. I very much hope that there is more to come.

Mission Command in the Age of Human-Autonomous Teaming: From shared intent to shared cognition

Every technological revolution has promised commanders better decisions through better information. Yet fog of war remains constant, writes Josh Wineera.



LTCOL Josh Wineera (Retd) served in the New Zealand Army for over three decades. He leads Kōtui Dynamics, a New Zealand company specialising in the adoption and application of human-autonomous systems teaming, and he is co-founder of high-tech consultancy Latent.

Mission command has endured because it is a philosophy of leadership rather than a method of control. Built on trust, commander's intent and disciplined initiative, it recognises that combat is too uncertain and dynamic for continuous centralised direction.

While the character of warfare continues to evolve, the principles underpinning mission command have proved remarkably resilient. What is changing is not mission command itself. It is the nature of the team to which it applies.

In a recent Australian Army Journal article, "Mission Command in a Multi-Domain Littoral Environment: Key Ingredient or Holdover?", Charles Miller asks whether mission command remains fit for purpose in a multi-domain littoral environment. He argues that increasing integration across land, maritime, air, space, cyber, the electromagnetic spectrum and autonomous systems may require commanders to move along a spectrum between decentralised mission command and more prescriptive command.

It is an important contribution to a debate that both the Australian and New Zealand armies will increasingly confront.



Dr Charles Miller. Image: Australian National University.

Miller frames the debate around the littoral environment. I contend that the more enduring challenge is human-autonomous teaming. Littoral operations describe an operating environment; human-autonomous teaming changes the nature of command itself. It shifts mission command from the delegation of authority towards the orchestration of distributed cognition across human and autonomous teams in order to achieve shared cognition.



Mission command begins with shared intent

Mission command has always depended on commanders creating sufficient shared understanding for subordinates to exercise disciplined initiative in accordance with the commander's intent.

Sixteen years ago, the Commanding Officer of 1st Battalion, Royal New Zealand Infantry Regiment (1 RNZIR), commissioned me to independently evaluate Exercise Absolute, a combined-arms live-fire deliberate attack.

Rather than observing from headquarters, I followed commanders through the entire orders process and accompanied them during execution. From battalion headquarters through company and platoon headquarters to an infantry section. It provided a rare opportunity to observe mission command as it unfolded in planning, decision-making and combat training.

One observation has remained with me ever since. Mission command succeeded not because orders became progressively more detailed, but because commanders at every level progressively interpreted and internalised the commander's intent.

The clearest example occurred at section level. A medium-range anti-armour weapon threatened the battalion's plan. By the time the task reached the section commander, he understood not only what had to be done, but why it mattered. Destroying that weapon was not simply another task in his orders. It enabled the platoon commander, supported the company commander's manoeuvre and ultimately contributed to the battalion's success.

The orders mattered. More importantly, they created shared understanding. That comprehension remains as relevant today as it was then. Human-autonomous teaming does not replace mission command. It extends it. Mission command still begins with the commander's intent and a shared understanding of purpose. Without that foundation, neither people nor autonomous systems can exercise disciplined initiative when circumstances inevitably change.

Human-autonomous teaming distributes cognition

Mission command has traditionally distributed authority. Human-autonomous teaming distributes cognition.

Autonomous systems are no longer simply sophisticated equipment. Increasingly they sense, process information, identify patterns, recommend actions and execute delegated tasks alongside human teammates. AI-enabled decision support contributes speed, prediction and pattern recognition. Autonomous systems contribute persistence, sensing and delegated action. Human operators contribute judgement, experience and operational context.

None is sufficient alone. Mission command now depends on integrating these different forms of cognition into coherent operational action. The commander's role is no longer simply to delegate authority. It is to orchestrate these distributed cognitive contributions into coherent operational effect.

Throughout my Army career, I learned mission command first as a subordinate, as a commander, and then teaching as a tactics instructor at the Australian Land Warfare Centre. In these roles, the expectation was the same: understand the commander's intent, apply judgement and exercise disciplined initiative. Human-autonomous teaming does not change that philosophy. It extends it.



Vector Scorpion drone. Image: NZDF.

Mission command has always depended on commanders creating sufficient shared understanding for subordinates to exercise disciplined initiative in accordance with the commander's intent. In the age of human-autonomous teaming, that responsibility evolves. The commander's task is no longer simply to ensure subordinates understand the commander's intent. It is to orchestrate distributed cognition so the entire human-autonomous team develops sufficient shared cognition to exercise disciplined initiative together.

That makes human commanders more – not less – important.

From section commander through to brigade commander, leaders will increasingly determine which decisions remain exclusively human, which may be delegated, when autonomy should be constrained and when intervention becomes necessary. AI does not remove uncertainty. It reduces the time available to understand it. That is why shared cognition becomes the next challenge for mission command.

This first generation of autonomous systems will expose a leadership gap before it exposes a technology gap.

The commander's task is shared cognition

Mission command is now evolving through three connected stages: (i) shared intent; (ii) distributed cognition; and (iii) shared cognition.

Shared intent provides purpose. Distributed cognition creates capability. Shared cognition creates coherent action.

Shared understanding assumes people develop the collective understanding required to accomplish the mission. Shared cognition recognises that understanding increasingly emerges from commanders, soldiers, AI-enabled decision support, autonomous systems, and networks working together. The common operating picture is no longer created solely by people. It is increasingly co-created by human and machine cognition.

Without shared cognition, distributed cognition simply produces disconnected intelligence, competing recommendations and fragmented action. With shared cognition, the entire human-autonomous team senses, interprets, decides, acts, and adapts in accordance with the commander's intent.

This is the next evolution of mission command.

The littoral does not redefine command

Miller correctly identifies increasing operational complexity demands greater coordination across domains. Long-range fires, contested communications and autonomous capabilities inevitably increase complexity. Complexity, however, does not change why mission command exists.

A warship is a single integrated fighting system under one captain. Navigation, engineering, survivability and combat are inseparable responsibilities vested in one commanding officer because the platform itself demands centralised command.

Land forces are different. Mission command is exercised from section commander through to brigade commander because companies, platoons, sections and small teams routinely disperse beyond direct supervision. Human-autonomous teaming will not be confined to headquarters.

Section commanders, platoon commanders, and company



Short-range drone operation. Image: NZDF.

commanders will increasingly employ autonomous systems as part of their own teams, requiring them to orchestrate distributed cognition in order to achieve shared cognition while exercising disciplined initiative in accordance with the commander's intent.

Embarking soldiers on a littoral manoeuvre vessel does not alter that principle. Maritime command governs the ship. Mission command governs the land force.

The littoral changes how soldiers arrive at the battle. It does not change why they require mission command once dispersed.

For both the Australian and New Zealand armies, the greater danger is allowing the coordination demands of joint and littoral operations to normalise centralised tactical control. Better information has never removed uncertainty. It has simply increased the tempo and complexity of command.

Leadership before technology

This is not simply a doctrinal debate. It has implications for force design, experimentation, professional military education, training and capability development.

The New Zealand Army is already recognising this challenge. Exercise Crete 2026 placed a deliberate emphasis on commanders making critical battlefield decisions and capturing lessons learned at every level of command, a focus that human-autonomous teaming will only make more demanding.

Every technological revolution has promised commanders better decisions through better information. History suggests otherwise. The fog of war remains constant.

Better information rarely reduces uncertainty. Instead, it increases tempo, complexity and the number of decisions requiring human judgement. Human-autonomous teaming follows the same pattern. The challenge is no longer simply making decisions. It is ensuring the entire human-autonomous team develops sufficient shared cognition to make the right decisions together. Preparing commanders to lead cognitive teams will become as important as acquiring the technology itself.

Although this article begins with land warfare, its application extends much further. Maritime forces will combine crews with autonomous vessels. Air forces will integrate crewed and uncrewed aircraft. Emergency services, logistics organisations and critical infrastructure operators will increasingly rely on autonomous systems operating alongside people.

Each will confront the same leadership challenge. How do humans and autonomous systems develop sufficient trust, context and shared cognition to operate effectively as one team?

Mission command has endured for decades because it recognises a simple truth: uncertainty can never be eliminated. Human-autonomous teaming does not change that truth. It changes who contributes to understanding it. Technology can be purchased. Autonomy can be acquired. Shared cognition must be developed.

The question is no longer whether organisations will adopt human-autonomous teaming. It is whether their leaders are being properly prepared to command cognitive teams.

New Zealand Army's Missing Battalion

A third battalion would create a three-battalion framework resolving the inherent fragility of the existing two-battalion structure, writes Graeme Doull.



Graeme Doull is a logistics management specialist. He was previously a New Zealand Army Armoured Corps officer and saw operational deployment to Bougainville and with INTERFET to East Timor.

There is a perception within the Army that New Zealand has too many Brigadiers for a force of its size. To some observers 13 Brigadiers in an Army with just a brigade's worth of soldiers appears difficult to justify. Personnel data obtained under the Official Information Act suggests a wider problem.

Benchmarking against a typical NATO force structure, the biggest imbalance in the New Zealand Army sits within the middle and upper layers of the organisation: a substantially larger proportion of Senior Officers and Senior Non-Commissioned Officers (SNCO) than would typically be expected.

There is an argument that a small army requires proportionally more personnel in staff and headquarters roles. Staff roles are typically filled by Captains and Majors at the operational level, and Lieutenant Colonels and Colonels at the strategic level.

Even allowing for this, the current structure is difficult to defend. The Army now has almost as many Colonels as Lieutenants. This raises legitimate questions in relation to organisational design and long-term resilience.

The SNCO structure is perhaps even more striking. The New Zealand Army has 302 Warrant Officers, equating to roughly one Warrant Officer for every four to five private soldiers. By comparison, an infantry battalion of around 600 personnel would typically contain only seven to nine Warrant Officers.

While additional Warrant Officers are required across headquarters, schools and specialist units, this number of senior soldiers appears excessive.

New Zealand has a small army and cannot realistically sustain every function maintained by larger militaries. A contributor to this overhead is the decision to retain independent doctrine, procurement, and training systems.

There is a strong argument for systematically aligning with Australian Army doctrine, standards and processes wherever practical. Reducing unnecessary duplication would free resources for front-line roles, and alignment would improve interoperability with our closest ally.

The wider public sector is under pressure to focus on front-line delivery rather than administrative support. Defence must be no exception.

The structural 'surplus' of 546 Senior Officers and SNCOs, if repurposed, represents sufficient budgetary and personnel headroom to generate an entire additional battalion-sized manoeuvre unit. This could also free up resources to help address rates of pay for more junior service personnel.

A third battalion would create a three-battalion framework that would resolve the inherent fragility of the current two-battalion structure, providing vital operational depth and sustainability.



This would allow for one battalion deployed, one preparing for deployment, and one regenerating capability. This rotational model would enable sustained operations and reduce pressure on personnel. It would also create an opportunity to establish a permanent land force component in the upper North Island.

Whangārei is a logical choice for an upper North Island battalion. It offers close proximity to Auckland – the country's economic and demographic centre of mass – without the accompanying cost-of-living challenges, while providing ready access to a deep-water port and a high quality of life. This would support recruitment and retention while enhancing national resilience.

Change like this requires political leadership – an internal Defence or Army review cannot navigate this opportunity.

Organisational theory suggests large institutions rarely choose reforms that reduce their own headquarters or senior management structures. Put crudely: turkeys don't vote for Christmas. If the Government wants a resilient combat force rather than a top-heavy bureaucracy, the Minister of Defence must explicitly mandate change from above.

Defence spending is about trade-offs. Decisions should be framed around future needs, not the status quo. In this case, the Government needs to ask: does New Zealand's security benefit more from an oversized headquarters, or would a third battalion in the upper North Island be a better investment?

Category	Typical NATO Share of Force	NZ Army ideal based on NATO (headcount)	NZ Army Actual (headcount)	NZ Army Actual Share of Force	Variance (headcount +/-)
General officers (incl Brigadiers)	<0.5%	15	15	0.3%	0
Senior officers (Majors - Colonels)	3-5%	174	376	8.6%	+202
Junior officers (incl Officer Cadets, Lieutenants, Captains)	8-12%	436	456	10.5%	+20
Warrant Officers and SNCOs	10-20%	654	998	22.9%	+344
JNCOs	20-35%	1,178	1,182	27.1%	+4
Private (or equivalent)	40-50%	1,904	1,335	30.6%	-569
	Total	**4,362**	**4,362**		

Left or Right: Frigate decision will come down to ideology

With major decisions on the naval fleet replacement unlikely until late 2027, choices will be dependent on who wins the upcoming election, writes Wayne Mapp.



Senior Contributor Hon Dr Wayne Mapp QSO was New Zealand's Minister of Defence and Minister of Science and Innovation from 2008 to 2011.

Defence has not been a policy area of any note in the upcoming election. However, the changing balance of power in the world is shaping the defence policies of the political parties. This is probably more significant with the Left bloc of parties compared to the Right.

The international trends are two-fold; one long term, the other short term. Each of these are shaping the approach of how New Zealand's political parties' approach foreign policy and security issues.

The long run trend has undoubtedly been the rise of China. While the rise of China has general international significance, it is particularly pertinent in the Asia Pacific region. New Zealand, as a Pacific nation, takes an intense interest in the evolution of the balance of power between China and the United States.

As a general rule, New Zealand attempts to strike a balance in its relationships with China and the United States. However, since the United States and Australia are New Zealand's predominant security partners, New Zealand takes more notice of their expectations in the security arena than it does of China's expectations.

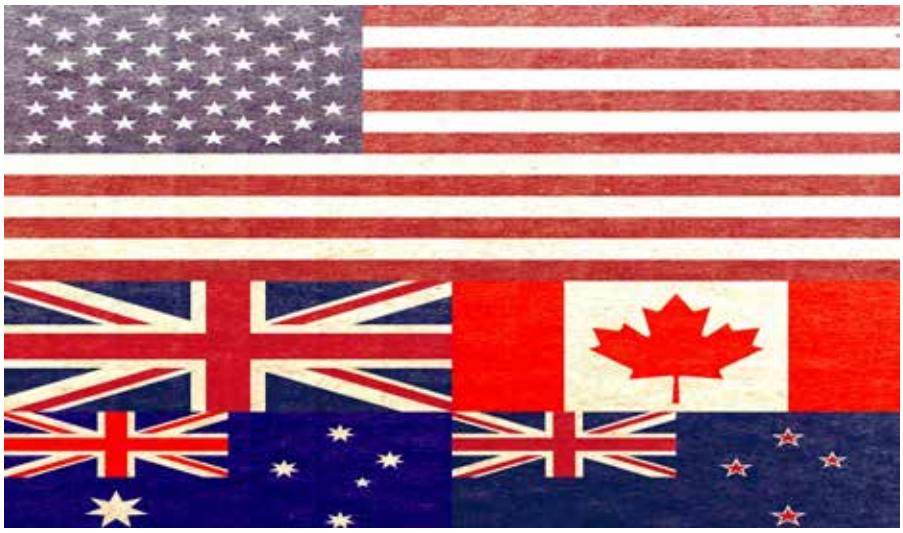
There are, however, indications, particularly among the Left bloc of parties, that New Zealand should extend its balanced view of international relations into the security area. If the incoming government is made up of the Left bloc, they will soon find out how viable such an approach actually is.

The short-term trend is wrapped up in the incumbent in the White House. President Trump has forcefully advocated American primacy and expects allies and partners to defer to United States leadership.

In the first 12 months of his current term, he was notably successful. Allies and partners have made significant commitments to substantially increase their defence expenditure, though there are exceptions. Spain has not yielded to United States pressure in this regard.

More recently, since the United States Iran war, United States allies and partners are taking a more independent approach to their security interests. European nations know that they must take the key decisions affecting their own security.

It is noteworthy that Australia is much less interested than the Europeans in taking such an independent approach. In contrast, Australia's objective is to more tightly bind the United States into a deeper defence partnership. This is irrespective of any specific United States administration, so this approach has continued during the Trump administration.



In early September 2026, Australian Defence Minister Marles met with his counterpart, Secretary Hegseth, in Washington. The United States stated that it intended to continue to build up its forces in Australia. Using the NATO measure, Minister Marles emphasised that Australian defence spending had reached 2.8% of GDP. This is more than twice that of New Zealand.

Given that Australia is New Zealand's only formal defence ally, the ongoing buildup in Australia, both of United States commitments and of Australian spending, will inevitably impact on New Zealand's choices.

In New Zealand there is an expanding divergence between the Left and Right Blocs. During the Trump era, some of this is to be expected.

Opposition parties will always have easier choices since their statements have no direct government consequence. All of them have forcefully opposed United States actions in respect of the Iran war. The most left wing, the Green Party and Te Pati Maori, advocate fully disconnecting from all aspects of the Western alliance, at least as it affects the United States. They tend not to comment on New Zealand's formal alliance with Australia.

Labour is more mindful of long-standing defence commitments, such as New Zealand's membership of the Five Eyes intelligence arrangements. They will be much more aware of the nuances of the relationship with Australia than would be their likely coalition partners.

The coalition government has been more circumspect than the opposition parties, though even they have become a little more forthright as the Iran war has progressed. As government, they are much more aware that within the life of the next New Zealand government, they will be dealing with a post Trump administration. Defence decisions have a time frame typically measured in multiple decades and thus are more influenced by long terms trends rather than short term expediency.

In 2025, the government produced the Defence Capability Plan (DCP), which set out likely purchases and allocated at least some of the money that would be required to fund them.

Notably, the most expensive part, the replacement of the naval fleet, remains unfunded. The coalition has made it clear that the major decisions on the naval fleet replacement won't be made until late 2027.

The indication is that for the frigate replacement, the choice will be between the Mogami frigate and the Arrowhead 140. Both will involve at least $5 billion for a one for one replacement for a force of two ships. If finance becomes the primary forcing factor, the Arrowhead 140 may have the advantage in that it can more readily be configured with a variety of combat capability options, including being very lightly armed.

The coalition government has indicated that defence spending will rise to 2% of GDP by the early 2030s. However, they have not provided a spending track that will lead to that outcome. Given competing budgetary priorities, it will be a challenge to reach the stated goal of 2% of GDP.

The choice of frigate will have a major impact on the ultimate size of the defence budget. Choosing the Mogami will inevitably require a larger budget. In contrast, the Arrowhead 140 would be more likely chosen if there is a financial need to reduce the level of combat capability of the ANZAC replacement.

So far as the opposition is concerned, it seems highly unlikely that defence spending will increase to 2% of GDP. A lightly armed version of the Arrowhead 140 would probably allow defence spending to remain with a 1.5% envelope. Two, perhaps three such lightly armed ships may be seen as appropriate replacements for both the ANZAC frigates and the two Offshore Patrol Vessels.

Lightly armed ships would go some way to meeting the requirements of Labour's likely coalition partners, given their view that the primary purpose of defence is peacekeeping, HADR, and environmental monitoring within the South Pacific.

Although the world seems more uncertain than in recent decades, this has not come to the fore in the election campaign. However, the international environment is flavoring the defence and security choices that the two major political blocs are making. The divergence between Left and Right is perhaps greater than at any time since the nuclear-free choice of the 1984 election.

Autonomous Technology: Achieving sea control through decision advantage

Autonomous surface vessels can play a part in attaining decision advantage in sea control missions, but there are significant challenges to wholesale adoption, writes Andy Watts.



Senior Contributor CAPT Andy Watts RNZN (Retd) is Maritime Defence Capability Consultant, AUSTAL. He was previously Deputy Executive Director, Australian Civil Military Centre, and an RNZN officer for over 30 years.

Some technologies are so revolutionary that requirements must be matched to technology, not the other way around as in traditional acquisition practice. Examples include breakthroughs in artificial intelligence, machine learning, and edge computing, and now autonomous air, surface, and sub-surface

Modern defence practitioners accept this inversion (although acquisition culture may not) and look for ways in which these breakthroughs can be applied to deliver military advantage and better value for money in defence acquisition.

This is not without risk, in that the bureaucratic safety delivered by carefully defined requirements approved across three to four successive layers of authority is not available. But if defence forces are to manage change at the speed of relevance, root and branch change is needed.

This article offers a discussion on the applications of autonomous technology in the naval sphere, including the challenges that must be overcome but that are seldom acknowledged by the more ardent advocates of autonomy.

Sea Control

Autonomy is a by any measure a revolutionary technology. The capability/requirements inversion referred to above applies; naval practitioners must seek applications for autonomy or be left behind. But the potential of autonomy for New Zealand cannot be realised unless the operational context in which RNZN capability protects our vital interests is considered.

In an article published by the New Zealand Initiative, Major General John Howard (Ret) makes a well-articulated case for sea control capability. It's a case that is all the more valuable for having being made by a very senior soldier – proof, if any were needed, that the bad old days of single service parochialism are behind the New Zealand defence establishment.

John's thesis, if I interpret it correctly, is that the free movement of goods and information across and beneath the world's oceans is vital to our national interests and that we must therefore make a proportionate contribution to defending it. That is what sea control is – defending our ability to use the oceans for our own legitimate purposes.

Sea control also allows us to project hard and soft power by sea – transporting and landing land and humanitarian forces without interference from hostile powers, and it allows us to protect the borders, resources, and ecological balance of our marine environment. In essence,



Global Autonomous Reconnaissance Craft. Image: US Navy.

this is what New Zealand naval combat power must do – enable us to exercise sea control in conjunction with partners and in our own right.

Some time ago, I attempted to support an MoD policy paper with solid data that refined the geographical areas in which shipping carrying goods vital to our national life needed to be defended – which obviously extended beyond the sea lanes leading directly to New Zealand.

I couldn't do it. International supply chains are now so numerous and diffuse that it would require months of access to commercially sensitive shipping data to even begin to identify where cargos destined for New Zealand were being carried in ships. The global supply chains for iPhones begin in 40 different countries, the raw materials for electric car batteries are mined in nine different countries, and their manufacture is similarly diffuse.

We are thus vulnerable to disruption to shipping on the routes to and from New Zealand, but also to disruption to shipping that doesn't come within thousands of miles of our borders. Defence against this requires sea control capability, both in the approaches to our country (which we will almost certainly have to defend unaided except by partner nation strategic intelligence systems), and in the wider region.

Combat Capability

As stated above, sea control requires naval combat capability. So what should our sea control capability be able to do, and what should our naval combat capability thus consist of? The most important point to note is that sea control is delivered by a capability system, not by a particular type of ship or aircraft. Within the following paragraphs, I offer a grossly over-simplified description of that system.

At the apex are the commanders who determine how resources should be allocated and missions assigned across a theatre, and the strategic intelligence systems that collect, process, analyse and disseminate information enabling multi domain situational awareness across our area of strategic interest. The strategic intelligence system consists of sensors, computing power, and people capable of applying the nuanced judgement needed to make sense of the vast amount of information that sensors and computers can generate. It informs Commanders' decision making and supports the situational awareness of forces throughout the theatre of operations.

The next layer consists of the tactical HQ (including Maritime Operations Centres (MOC)) and deployed forces that perform the missions assigned by Commanders. These forces are broken down into sub-forces that perform the specific tasks needed to achieve the missions.

For instance, surveillance aircraft, crewed and uncrewed, might be brought together in a Task Group that refines the intelligence provided by strategic systems with more detailed surveillance. Surface forces might be formed in a Task Group providing direct protection to shipping and land forces in transit. Surface forces, crewed and uncrewed, would also contribute to theatre situational awareness as they patrol or pass through a particular area, in addition to using their own sensors to attain local decision advantage over adversaries (see below).

This is the form of sea control task that New Zealand naval combatant forces are most likely to be called upon to perform, and it's in the context of this task that I hope to be able to explain the relationship between the crewed and autonomous systems that I believe we should be considering.

Decision Advantage

All military operations depend for success on the attainment of what is known as decision advantage, which is a state of cognition in which our own commanders can make better decisions more quickly than their opponents. This depends on both the quality of the strategic intelligence and analysis available to the commander, and the commander's own ability to make sense of the environment in which they operate.

The Commander's detailed situational awareness, though supported by strategic intelligence

systems, is limited by the range of own ship sensors and those of the other ships and aircraft with which the ship is cooperating, shared via data links.

Autonomous surface vessels can greatly enhance local situational awareness and thus decision advantage by extending sensor coverage. They can do this in close cooperation with a crewed combatant, allowing the localisation of potential threats through the triangulation of bearings detected by both the combatant and the autonomous vessel, or through independent operations at some distance from the autonomous vessel's control combatant, expanding the area under direct and detailed surveillance.

Independent autonomous vessel operations can also be carried out under the control of other parts of the sea control system, including shore based tactical HQ such as Maritime Operations Centres (MOC). Strategic intelligence systems provide an overarching view of our Extended Continental Shelf (ECS), Exclusive Economic Zone (EEZ), and Territorial Waters (TW). This overarching view is amplified and refined by information collected by P-8A and, in the future, autonomous aerial vehicle patrols.

A long-range autonomous vessel could complement these capabilities by close and continuous monitoring of targets of interest detected by strategic and aerial systems, pending interdiction by a crewed ship should this be necessary. It could also carry out long duration surface patrols, which while nowhere as effective in terms of coverage as a crewed or uncrewed aircraft, could focus on areas of special interest, such as a marine protected area, relieving some of the burden on aerial assets and much of the burden on crewed patrol ships.

The other role that has been widely touted for autonomous vessels is the provision of offboard



Autonomous Low-Profile Vessel. Image: US Navy.

magazines. Vertical Launch Systems (VLS) fitted to surface combatants (including the Anzac class) offer very rapid and efficient missile launch, but they are all but impossible to replenish at sea. Autonomous vessels equipped with VLS and controlled from a surface combatant increase magazine depth, which is likely to be an issue in high intensity combat.

Finally, the mere presence of autonomous vessels in a sea control force complicates the adversary's surveillance and targeting problem by increasing the number of force elements that must be detected, localised, classified, and monitored. Our own and our partners' forces will almost certainly be numerically outmatched in any period of tension or conflict; the part played by autonomous vessels in offsetting this could be significant, whether the adversary is a state actor or a criminal organisation engaged in drug or people smuggling.

I would rank the near term potential applications of autonomous vessel technology in the following order of significance (noting that they are already extensively employed for expeditionary reconnaissance and mine countermeasures):

- Enabling sea control in our TW, EEZ, ECS and those of our partner nations with focussed, long duration surveillance operations complementing other elements of the sea control system, including strategic systems, crewed and uncrewed aircraft, and crewed interdiction vessels.
- Enabling sea control on deployed operations by extending combatant sensor coverage.
- Complicating an adversary's surveillance and targeting problem.
- Assuming challenges around the protection of control and communications data links are overcome, by increasing combatant magazine depth.

Challenges

And now to the challenges of autonomous. Firstly, in line with almost every other UN member state, New Zealand is a signatory to the UN Convention on Certain Conventional Weapons (CCW), and has endorsed the US-led Political Declaration on Responsible Military Use of Artificial Intelligence and Autonomy. As I read it, a fully autonomous warship governed by AI and pre-mission programming is currently inconsistent with nation states' obligations under the CCW



RNMB Harrier, an autonomous mine warfare USV. Image: Photo Stevie Burke/UK MOD.

and the Law Of Armed Conflict (LOAC). Autonomous vessels must be under human control such that any decision to deploy lethal force is subject to that control.

Secondly, the effectiveness of an autonomous vessel depends on radio frequency communications and control links that are highly resistant to disruption or compromise. An autonomous vessel patrolling an EEZ could revert to pre-planned mission control logic if communications are disrupted, but links would need to be restored for it to remain fully effective. However, an autonomous combatant consort extending sensor coverage or providing magazine depth would need even more robust communications links.

This could potentially be achieved using the light spectrum and by keeping the autonomous vessel within the range of line-of-sight communications (which would limit its effectiveness), but the challenge involved cannot be assumed away. Dependence on radio frequency communications also creates a vulnerability to cyber-attack which must be allowed for in autonomous vessel capability development.

Thirdly, it could be argued that the current state of maritime autonomous technology does not allow an autonomous vessel to comply with the International Regulations for the Prevention of Collision at Sea (COLREGS) with the necessary degree of assurance unless it is under direct (albeit remote) human control. This applies particularly in areas of high traffic density. However, significant advances are being made in this area, and it is possible that COLREGS compliance requirements could be satisfied in the future.

Fourthly, an autonomous vessel is a vessel. Vessels need maintenance, and they break down – often at the worst possible time. An uncrewed vessel operating in our EEZ could be provided with a 'limp home' mode in the event of breakdown and the necessary propulsion redundancy. However, an autonomous consort to a combatant will have to deploy over the same ranges and in the same environmental conditions as the combatant.

What would happen if it breaks down on a surveillance task 200 miles from its parent combatant, particularly if communications are lost? How would the risk of autonomous vessel breakdown in environmentally sensitive areas such as the Great Barrier Reef be managed? How would damage caused by high sea states be repaired?

Finally, the autonomous vessel will carry a sensitive, classified payload. How is it defended against attack, including boarding and seizure by hostile actors at home or abroad?

I would rank these challenges in the following order of significance:

- CCW and LOAC compliance.
- Maintaining and repairing on task autonomous vessels and payload systems.
- Preserving communications data and control links with autonomous vessels in a contested electro-magnetic environment.
- Cyber protection of autonomous control and payload systems.
- Defending autonomous vessels from attack and seizure.
- COLREGS compliance.

In Conclusion

Notwithstanding the challenges identified above, uncrewed and autonomous systems are becoming an increasingly important component of the sea control system. It is probable that at least some of the above challenges will be addressed in the near future, given that advanced partner navies have set in place programs for the wholesale adoption of advanced autonomous systems. The Australian defence industry, including companies such as Austal (to which I consult) and Greenroom Robotics, is heavily committed to developing autonomous solutions to maritime operational problems.

In the here and now, autonomous surface vessels can play a part in attaining decision advantage in sea control missions, particularly in our own EEZ and those of our Pacific partners. But wholesale adoption on the scale advocated by some depends on progress in addressing the challenges identified above.

Rivets or welds? Defence industrial base must relearn lessons of speed over quality

Future wars are not today's wars, and over-indexing on one capability or environment is a costly mistake, writes Chris Morton, Vice President, Industries, IFS.



LTCOL Chris Morton (Retd) is Vice President, Industries, IFS. He served in the US Army for over two decades, piloting AH-64 Apaches, and retiring as Aviation Battalion Operations Officer, 101st Airborne Division.

In November of 1943, the Liberty Ship SS John P. Gaines broke in two and sank, resulting in the loss of 10 of her crew. The board of investigation found that the grade of steel used in welded construction embrittled in the cold waters of the Aleutian Islands.

Today, the defence industrial base (DIB) is facing a Liberty-like moment: immense demand for volume and speed, innovation from founders outside of the traditional industrial base, and existential global threats, where getting things wrong has dire consequences. The industrial base would do well to take a moment to look back at history's lessons to balance the speed the moment requires with the well-established foundations of testing and quality.

The lessons

The Liberty Ship was a class of cargo ship used in World War II that was simple, slow, and unglamorous – and critical in moving people and supplies for the war. Demand wasn't the issue – the time it took to make one was. Historically, it took an average of 355 days to build one ship.

Henry Kaiser was a teenage dropout who made his name in government paving contracts. He brought his Henry-Ford style mass-production logic to the Liberty ship. His plan? Replace rivets with welds. Welding was better suited to mass production and required less skilled labour. His showpiece vessel, the SS Robert E. Peary, took just over seven days to complete.





The war demanded speed and Kaiser delivered. Putting ships in the water wasn't the problem, keeping them afloat was – often overloaded and in harsh conditions. Unfortunately, of the 2700 Liberty Ships produced, there were 1500 instances of significant brittle weld fractures, with twelve ships breaking in half without warning.

History's rhyme

While the West isn't technically in a "World War" today, the demand for speed and volume mirrors the conditions of 1943. Conflict in the Middle East, the war in Ukraine, and looming threats across the globe have spurred nations to invoke a need to be on a "wartime footing," in the wake of decades-long outsourcing of industrial manufacturing.

The war in Ukraine outstripped NATO's peacetime production capacity for 155mm artillery shells within months. In 12 days of war in June of 2025 between the US and Israel versus Iran, the US reportedly fired 28% of all THAAD interceptors ever delivered.

In 2025, US Secretary of War Pete Hegseth said it explicitly, "This is a 1939 moment or hopefully a 1981 moment," and later in testimony to the U.S. Congress, "We've sent an unambiguous demand signal to industry partners to build more and build faster." EU Defence Commissioner Andrius Kubilius has echoed these sentiments, "We cannot afford to slow it down... we are asking industry to speed up."

History is rhyming, so how should the defence industrial base embrace speed and innovation without repeating past mistakes?

The pitfalls of innovation at speed

Tectonic estimates that from the first half of 2025 to 2026, private investment in defence tech has increased by 40% year over year. Across Silicon Valley, defence has become en vogue, but the Kaisers of today don't come from the traditional defence prime ecosystem. Palmer Luckey of Anduril was best known for his VR headset, Dino Mavrookas of Saronic is a former Navy SEAL and spent time in private equity, and Chris Power of Hadrian has a background in e-commerce.

But defence hardware isn't an app or a commercial VR gadget. Quality testing processes enshrined in defence manufacturing are lessons learned on the battlefield. Companies like Anduril are leveraging commercial practices to speed products to market, and are also institutionalising testing as an accelerant. For example, it is employing field engineers embedded with their customers – often in harm's way.

This way, lessons learned first-hand can be brought back to base for improvements, but still recent failures – such as mechanical issues with unmanned fighter jets and drones crashing and missing targets in combat – means that not every lesson can be caught early. Failure found in the field rather than on the practice range.

The OODA loop

In fact, the war in Ukraine has become the fastest real-world example of the Observe, Orient, Decide, and Act (OODA) loop for military technology in a generation.

From low-cost attritable drones to exquisite counter-drone munitions, this conflict has offered a preview of future warfare that has captured the industry's imagination. Some commentators have said that "non-drone militaries are obsolete." History is replete with nations not recognising the evolving nature of

warfare. It took the U.S. years to adapt to the impact of Improvised Explosive Devices on convoys in Iraq.

Industry is responding at pace. In July of 2026, the EU launched an industrial partnership with Ukraine focused almost exclusively on drones, disbursing a billion euros.

Over-indexing on one data point

In the U.S., Georgetown's CSET tracked 283 separate investment deals in U.S. drone companies between 2010 and 2025 – with 77% of them going into small, cheap systems in demand in the war in Ukraine.

But let's take a breath. Nobody is arguing that drones in Ukraine don't work. Against that adversary, and in that terrain they demonstrably do. But while these systems have undoubtedly bent the curve in Ukraine, they are not a panacea for broad defence investment. This type of drone wouldn't make it past the ocean breakers in the Taiwan Strait.

Defence manufacturers would do well not to just focus on what's happening in Ukraine. It is a real data point, but it isn't the only ocean that the fleet will sail in.

Instead, the DIB should listen to the people who would have to do the fighting, not the VC hype. In July of 2026, Task Force 401, the Department of War's lead body on drones, released a publication that explicitly states, "In sum, drones are not a magic weapon."

The DIB must go back to first principles

The DIB is developing and building for the military and defence, and must not forget that this is in a different league from most of manufacturing.

Trae Stephens, in a now famous article in *War on the Rocks*, pointed out, "In 2018, Under Secretary for Research and Engineering Mike Griffin noted that, on average, it takes the United States 16 years



to deliver an idea to operational capability. Software, by contrast, is developed by shipping a minimum viable product out the door as quickly as possible and seeing where it fails." As a former U.S. Army attack helicopter pilot, a "minimum viable product" is not a helicopter I would have climbed into.

Yes, there are benefits to the current move to "design to build." While these ideas can undoubtedly improve the speed of manufacturing, the defence industry has to keep its customer in mind – the warfighter. There are ways to both improve speed while maintaining safety and performance.

The lessons the DIB must learn

The value of the digital thread. Today's best industry-specific business systems are not just financial reconciliation software solutions. They are robust and enable a real digital thread – from engineering to production to lifecycle management. The DIB needs to invest in just such a system – one that is specific enough to handle the unique requirements in the defence industry – yet broad enough to cover the full lifecycle of the assets they make for Soldiers, Sailors, and Airmen.

Defence manufacturers should heed the lessons of the past and learn from the wars of the present, when nations demand speed over all else. *First, testing shoulder-to-shoulder with the end user is vital*, especially as several companies have little defence experience. Manufacturers can go fast, but they must fail fast.

Second, learn the right lessons. Future wars are not today's wars, and over-indexing on one capability or environment is a costly mistake.

Finally, don't ever design to build in defence manufacturing. Manufacturers must design to operate. Doing so is fundamentally better, with robust data and technology simply unavailable in 1943.

As nations find themselves rearming in the modern threat environment, they are being handed the same choice, with a faster clock – we don't need to wait until the ship splits in half.

RNZN and Customs Uncrewed Surface Vessels deploy in Fiji waters

Royal New Zealand Navy, New Zealand Customs Service and Fiji joint operation deploys USVs for persistent maritime surveillance in EEZ.

At the request of the Government of Fiji, the jointly owned RNZN and Customs Uncrewed Surface Vessels (USV) Tahi and Rua have carried out a four-week deployment in the waters of Fiji's EEZ.

The USVs were delivered to Nadi by a Royal New Zealand Air Force C-130J Hercules, and then transported by road to Vuda Marina between Nadi and Lautoka to be launched.

Together, the USVs identified 137 vessels of interest that required additional scrutiny during a 24/7 surveillance of known maritime routes.

Powered by a combination of wave, solar and wind energy, the USVs are capable of remaining at sea for weeks at a time, operating around the clock without requiring resupply.

Equipped with an array of high-tech surveillance, positioning and photographic systems, Tahi and Rua continuously reported their location and observations back to a monitoring centre.

The operation aimed to enable the Republic of Fiji Military Forces to develop a clearer understanding of activity across the region, including volume and patterns of maritime traffic.

The insights generated may, in the future, assist Fiji in identifying vessels that do not conform, allowing an interception, boarding and thorough search.

Intelligence on suspicious vessels sourced by NZCS may also be passed to RNZN controllers in a monitoring centre. A USV could be moved to areas where vessels of interest are known to operate or where illicit cargo may be transferred.

Fiji's Maritime Essential Services Centre (MESC) in Suva is assessing the information obtained by the USVs during this operation.

"The ultimate goal is to ensure we have persistent presence, feeding back here into the MESC," said MESC director Lemeki Lenoa. "Not only do the USVs help us address issues around manning, but it allows us to address the fuel crisis, because they are completely green-powered.



A USV conducting surveillance in Fiji EEZ. Image: NZDF.

"We can deploy them into areas to help understand what is happening in our maritime domain, and that helps us – Navy, Customs, Fisheries, Police – develop capabilities and capacity to better respond to threats."

The MESC was designed to bring partner agencies and nationalities under one roof, to address shared challenges in the region, he said.

"With all the support we've received so far, it's helped us achieve actionable, tangible outcomes, by being able to provide intelligence or information to our partner agencies who can then prosecute these cases successfully in court."

"This technology is fundamental in supporting Fiji's fisheries and border surveillance, environmental monitoring and the protection of the country's extensive maritime domain," said Chief of the Fijian Navy, Commodore Timoci Natuva.

"Illegal narcotics entering our country is causing so much harm and misery to our people, so any means to combat this is beneficial to the nation."

Dual Cognitive Leadership: Preparing Leaders for the Human-Autonomous Force

Militaries need to prepare their leaders for environments in which humans are no longer the only source of cognition, write Kōtui Dynamics' Josh Wineera and Derek Tunui.



LTCOL Josh Wineera (Retd) served in the New Zealand Army for over three decades. He leads Kōtui Dynamics.



Derek Tunui is a former logistics officer in the New Zealand Army. He is a Director and Lead for Civil Sector Emerging Technologies at Kōtui Dynamics.

Military leadership has always adapted to changes in warfare. New weapons, communications, sensors and information systems have changed how commanders understand the battlefield and exercise command.

Artificial intelligence and autonomous systems are different. They are changing the composition of the military team itself. Humans are no longer the only cognitive actors in that team.

Autonomous systems sense, classify, analyse, recommend and increasingly act. Militaries are already incorporating first generation cognitive and autonomous systems into operational forces. Leader development has not kept pace with capability development.

That gap is now visible. It will grow. We call the emerging requirement Dual Cognitive Leadership.

Dual Cognitive Leadership does not replace military leadership. Nor does it replace mission command. Intent, trust, initiative, judgement and accountability remain central. What changes is the environment in which those principles are applied.

Military leadership doctrine was built for organisations in which humans were the cognitive actors. That assumption no longer holds.

Trust in a subordinate is not the same problem as calibrated trust in machine cognition.

Delegating authority to a junior commander is not the same as allocating cognitive work to an autonomous system. Shared intent between people does not automatically create shared cognition between human and machine teammates. Command responsibility becomes more demanding when analysis and action occur at machine speed. The principles endure. Their application has changed.

Mission command provides the foundation. Its strength has been enabling distributed action through shared intent. Leaders communicate what must be achieved and why. Subordinates exercise judgement and initiative within that intent.

Human autonomous teaming extends the problem. Intent remains human, but cognition is now distributed across the team:

Shared Intent → Distributed Cognition → Shared Cognition → Co-created Action

Human command responsibility runs through the entire chain.

This argument does not emerge from nowhere. David Alberts explored what happens when information, decision making and command become distributed across networked forces. David Woods has spent decades examining joint cognitive systems and how humans and increasingly capable technologies function together. Mica Endsley's



work on situation awareness and automation demonstrates the importance of maintaining human understanding, appropriate trust and the ability to intervene.

Those intellectual traditions are now converging with a practical military problem.

So who leads the cognitive team?

Consider the infantry section commander. The section increasingly consists of human and robotic soldiers fighting alongside each other.

This is not an FPV drone controlled from a distance or a missile launched from a desktop. The robotic teammate is in the close fight. Like the human soldiers around it, it moves across the battlefield, seeks and closes with the enemy, and contributes to killing or capturing them regardless of season, weather or terrain. That changes the nature of the team.

The corporal leads human and autonomous teammates through the same close combat problem. They move together. They depend on each other. Intent must translate across both forms of cognition. Cognitive work must be allocated. Trust must be calibrated. Human soldiers must understand and anticipate the behaviour of their robotic teammates. The commander must understand when to intervene and when to allow autonomous action.

Command responsibility remains human.

This is not remote warfare. It is a dual cognitive team in close combat.

The same leadership problem appears elsewhere, although in less confronting forms.

A logistics captain leads human technicians alongside autonomous vehicles and aircraft while AI systems monitor demand, forecast consumption and recommend distribution priorities. The leadership task extends beyond operating the technology. The captain allocates cognitive work, judges machine recommendations and decides where human judgement remains decisive.

A tactical air commander aboard a P-8 operates inside a distributed cognitive system of crew, sensors, networks and machine generated mission intelligence. Autonomous aircraft add another cognitive and physical layer. The commander must turn those separate contributions into shared understanding and coherent action.

AI is also entering the headquarters. It contributes to intelligence preparation, course of action development, wargaming, targeting, logistics and decision support. The Chief of Staff therefore carries a new responsibility: the cognitive architecture of the headquarters. Human and machine cognition must be orchestrated while preserving judgement, resilience and command responsibility.

These are different leadership environments. They cannot be addressed by an operator course.

AI literacy is important. It is not leadership development.

Technical training is essential. It is not leadership development.

Human autonomous teaming skills are necessary. They do not by themselves prepare someone to command a dual cognitive organisation.

Leaders must understand how cognition is allocated across the team. They must establish appropriate levels of trust in machine outputs. They must recognise automation bias, manage cognitive load and understand when intervention is required. They must maintain command responsibility when recommendations, analysis and actions increasingly originate outside the human chain of command.

The requirement changes by rank, service, branch and function. It also changes with the complexity and authority of the autonomous systems being led.

This is a leadership development problem, not simply a technology problem.

Military organisations already possess sophisticated systems for developing leaders. Those systems now need to prepare people for organisations in which humans are no longer the only source of cognition. Leaders need to be educated, exposed, practised, observed and assessed in environments where human and machine cognition operate together.

Technology can be purchased. Autonomous capability can be fielded. Preparing people to lead it requires deliberate development. As militaries build the human autonomous force, the more immediate question is: Are we preparing our leaders as deliberately as we are preparing our technology?

Dispelling Frigate Myths: Two plus two does not equal three, and other fables

Three fully fitted frigates is the only sensible benchmark, and a comparative assessment suggests Mogami over the Type 31, writes Fred Wilson.



Rear Admiral K.F. (Fred) Wilson CBE LVO JP RNZN (Retd) is a 41-year RNZN veteran. He served as Chief of Naval Staff (1997-2000) and Deputy Chief of Defence Staff (1995-97). Among a wide range of postings, he was Commanding Officer of three frigates and the initial NZ Project Manager for the Anzac Ship Project through to contract signature.

Debates on frigates, how many frigates, why we need frigates, and every other permutation that includes the word frigates, draws an eclectic band of commentators.

Most have appropriate backgrounds to justify their claim to be listened to, but some do not. They advance one-liners and slogans of jargon that have the limited authority of a Victorian cookbook in a modern kitchen. Of course, everyone is entitled to an opinion, but if it lacks authority, credibility or justification – or even common sense – it does not follow that it is worth listening to.

Two plus two does not equal three

Peter Greener has provided an excellent summary of the recent history on the number of frigates that is under active consideration. Lest there be any doubt, the only sensible answer is three.

The science says three is the minimum – as per Professor G Anthony Vignaux's 1997 analysis.[1] The evidence shows two is not enough – Navy capability reports over the last two decades show alarming gaps in combat capability, which, for a maritime nation reliant on trade, is just not acceptable.

Four would be desirable, but even in buoyant economic times, a nation must balance expenditure across a range of demands. Allocations to nice-to-have projects that exceed minimum sustainable output levels are irrational. So, while three frigates is a questionably viable minimum, government output demands of the Navy will have to adjust to that restraint.

But then come the eccentric ideas to reduce the scope. Out of the blue and without rationalisation (and therefore surprisingly), Greener has suggested that four frigates could be purchased, but as two fully fitted and two 'fitted for but not with' or FFBNW. He doesn't postulate what would not be fitted, but it is assumed he means the combat capability.

Everywhere FFBNW has been tried, it is touted as an operational evolution, but is in reality, political farce masquerading as fiscal rectitude. It has always become 'fitted for but never with'. Conflict usually arrives with little warning. Certainly, less than the two- or three-year timeframe required to source, obtain and back-fit a capability with equipment that is probably out of production.

An option such as Greener suggests is not a viable solution. When war breaks out, you fight with what you've got, not with what you would like sometime in the future. Three fully fitted ships is the only sensible and affordable benchmark.

[1] G. Anthony Vignaux, The Navy Critical Mass Argument, Victoria University of Wellington, Wellington, July 1997.



Type-26. Image: BAE.

Another idea that has been advanced is to have two frigates and two OPVs. John Howard has provided a useful tabular summary of the consequences of that approach in capability terms. Even with common equipment (as far as is technically possible) on all four vessels, you are still only operating two frigates, and we already know that doesn't work. It is the sustainable output that counts, and because the Government wants a sustainable frigate output, the minimum (albeit marginal) number to deliver that is three fully fitted frigates.

And to all the Clausewitz-quoting, Sun Tzu-loving critics out there – yes, mass is important. But an OPV is a liability in a combat force. Their lack of capability adds to the defensive load of the force and dilutes its combat effectiveness. It is like adding lukewarm water to a hot bath. The results are discouraging and jeopardise the aim.

Some commentators, such as Marc Parsons for example, argue that frigates are 'exquisite' platforms. This is a term used pejoratively as an alternative to 'gold-plated', 'over-specified' or 'state-of-the-art', and designed to be deliberately demeaning without justification. Marc, a former Army officer, can be assured that the sailors who have served onboard any New Zealand frigate did not think they were living and working in elegant and overly-priced circumstances, and operating the most expensive equipment money could buy. New Zealand has only ever acquired general-purpose ships with capable but utilitarian weapons and sensors.

Australia for example, categorises the Anzac and Mogami frigates as Tier Two combatants. The UK is building the Type 31 frigate as a lower-cost alternative to the more capable and more expensive Type 26 frigates. The three frigates that could comprise the next naval combat force for the NZDF will not be 'exquisite' either.

There is also an argument that hordes of low-cost unmanned vehicles are the way of the future. Certainly, as far as continental warfare has demonstrated, they are changing the battlefield. Where you have real-time surveillance in coastal and inland waters, they have also demonstrated lethality. But it would be wrong to extrapolate that success into the broad ocean expanse of the maritime domain without significant reservations.

Without doubt, New Zealand can leverage unmanned vehicle technology to substantially improve its surveillance capability. But even in a constabulary role, an unmanned vehicle cannot arrest a recalcitrant fisherman, drug runner, or any other ne'er do well.

At the higher end of the conflict spectrum, a large ship carrying a quantity of drones to overpower an enemy becomes a high-value target itself that then requires the protection of frigates and other vessels. Unmanned vehicles have a future without a doubt, but the utility and general-purpose capability of the frigate will still be required for the foreseeable future.

There is also an unanswered question around the legal liability of flag state navies operating autonomous vehicles on the high seas, and their responsibilities in responding to distress under the



Henderson Defence Precinct: Image: Australian Submarine Agency.

SOLAS convention, and other events. Also, the Geneva Convention obligates the rescue of shipwrecked mariners and downed airmen, which an unmanned vessel will be unlikely able to fulfil, unless suitably configured. And there are also the flag state responsibilities and accountabilities with regard to their unmanned vessels causing injury, damage or marine pollution when they are not meeting the fundamental requirements of maritime law, as it currently exists, to maintain a proper lookout.

These are, of course, resolvable issues. Indeed, the International Maritime Organization (IMO) introduced a new, non-mandatory, International Code of Safety for Maritime Autonomous Surface Ships (MASS Code) operating within the four identified degrees of autonomy, which came into force on 1 July 2026. The core concept in the code is one of risk assessment. MASS operators must identify potential risks and demonstrate how they will manage them throughout a vessel's operation. Crucially though, it stipulates that the master retains overall responsibility for the ship at all times – even if not on board the ship. The code will require some massaging into a procedural framework to apply militarily, including expectations in time of war.

For example, the routine manoeuvring of a military unmanned surface or sub-surface vessel (USV or USSV) is currently generally undertaken by an experienced but relatively junior operator – certainly someone well below the rank and command proficiency of the commanding officer of a surface ship and unlikely to meet the IMO code's requirements. For now, the code only applies to cargo ships above 500 GRT, although Canada, for example, has introduced rules for its waters that addresses small vessels (under 12m) of autonomy levels 3 and 4.

Rationalising the IMO requirements into a military context for use on the high seas is a fairly urgent requirement, because the IMO aims to introduce a final and binding MASS code in 2030 to come into force in 2032 – around the time the replacement frigates could begin arriving with their embarked capability to launch USVs and USSVs. Their commanding officers will need to know their onions, and their legal accountabilities and protections – not only for the vessels they are on, but also the ones they will have responsibility for.

Lastly, someone will raise the idea of phasing or sequencing, which is Treasury jargon for "kick the can down the road a bit". It is a bureaucratic method of deferring a decision. It was employed with the Anzac Ship Programme, and as related by Greener in quoting Geoffery Palmer, inevitably leads to no decision.

It will be interesting to see what contractual arrangements are arrived at, if, as expected, the Mogami option is preferred. Whether the Japanese push that some vessels are built in Japan, and/or New Zealand finds a way to inject itself into Australia's build programme at Henderson, WA, in a way that still achieves timely delivery, will be an interesting exercise. Whatever mechanism is adopted, a contractual or multi-contractual arrangement for

[2] I do not include in my analysis Jim Gilmour's Anzac Frigate Replacement: The option of least regret given Jim's role as a strategic adviser to Babcock.



Victory Class Multi-Role Combat Vessel. Image: Republic of Singapore Navy.

the firm delivery of three frigates is required.

I note in passing the thoughtful contributions recently by Graeme Doull and Andy Watts, [2] but I note a critical fault in their reasoning when it comes to suggesting the nature of new ships. New Zealand is industrially insignificant, particularly in the defence industry space. We are a defence equipment taker, not a maker. We bravely talk about being innovative and "fighting above our weight" – an oft quoted belief that is rarely true, is akin to 'whistling against the wind', and is actually the result of political parsimony manifested as an excuse. But, ultimately, we have no influence over the direction of naval shipbuilding or equipment sophistication.

We have demonstrated an ability to be niche providers certainly, but our major defence capital equipment acquisitions are always going to be designed, done, and delivered by someone else. We will always be a follower, and all we can control is how fast we follow. That butts up against largely immovable replacement timeframes, which always demand that we can only acquire some of what is available, not what we may dream of as being perfect. In NZ defence procurement, Realpolitik rules, not Idealpolitik (policies guided by moral principles or ideals) or even Gefühlspolitik (policies driven by appeals to emotion or popular sentiment).

New Zealand has never had the luxury of a bounteous GDP that allows dalliances into building concept designs and trialling expensive prototypes of defence equipment. Quite rightly, to ameliorate risk we have acquired equipment of proven design with respected in-service history. That is not going to change. Of course, thoughtful commentators can still advance ideas and concepts that challenge conventional wisdom, but don't expect any New Zealand Minister of Defence to take up your inspired proposal any time soon.

Multi-role by containerisation is a failure-prone risk

It is common for armchair strategists to sing the praises of multi-role vessels that offer task flexibility through containerisation. The concept of 'containerising' role equipment into interchangeable modules that can be transferred on and off a ship to perform a desired role was first comprehensively tried in Europe in the 1980s with the Stanflex concept. It was only partly successful, and has not been widely developed further, except for coastal vessels. It is being tried in the Singaporean Victory-class, but again, generally only aimed at local SLOC protection in littoral waters.

Containerised exchange of sophisticated military equipment is an exacting, extended, and expensive undertaking. Exchanged equipment must be tested, calibrated, and certified before it is trialled to confirm compatibility with fitted ship systems, often involving integrated electrical, hydraulic, environmental, and digital sub-systems. It is not a simple plug-and-play scenario, and it is inevitably compromised by the natural degradation and fault development that arises from the unused modules lying dormant. That can be countered by storing them in very costly complexes that replicate ship utilisation and conditions – better to just build the ship in the first place.

Indeed, what previous users of the concept found is that it was more cost effective and more operationally efficient to keep the same module in each ship, and to task the correctly configured ship directly to perform the desired mission. Therein lies the rub that condemns the whole concept of containerised vessels. If you go to sea equipped for a specific role and come up against a situation demanding a different response, it will take several days, probably weeks, to return to port, reconfigure, and sally forth again. A ship configured for multiple containerised roles can effectively only perform one role at a time. A modern frigate however, is built and configured to execute multiple tasks in a coherent manner.

New Zealand has resorted to multi-role solutions in the past, and on the surface it appears to provide cost savings. But any attempt to do so is always a compromise, with additional equipment shoe-horned into a hull designed for something else. Ultimately, the ship can only reliably perform one role at a time. You don't get two-for-one. You get each one for half the time, sometimes.

The latest foray into this dark world is the decision to forego replacing the former HMNZS Manawanui, which was already multi-role (hydrography and diving). These two roles are being added onto HMNZS Otago, a smaller ship designed to be capable of patrolling the Southern Ocean. It proved incapable of doing that successfully, alarmingly despite naval architects stipulating for years that sustained presence in those waters requires a vessel of substantially over 100m – frigate-sized.

Otago now will have three roles, even though it was never designed for – or fitted with – the equipment for a safe and fully-functioning diving role, or any specialist capacity for hydrography. It is a pig's ear, and a structurally unsafe platform to accommodate those roles, but that is what the *2025 Defence Capability Plan* has delivered. It seems more a case of finding a purpose for an otherwise poorly designed and under-utilised vessel, which is most unlikely to turn out well.

There are no viable shortcuts in delivering military capability. You get what you pay for, and nothing more. Trying to force more into an already full milk bottle only produces one outcome, and crying about it afterwards is not a solution.

Type 31 versus Mogami FFM

There is, understandably, a lively debate over the merits of the two ships selected as the shortlist



HMNZS Otago (foreground). Image: NZDF.

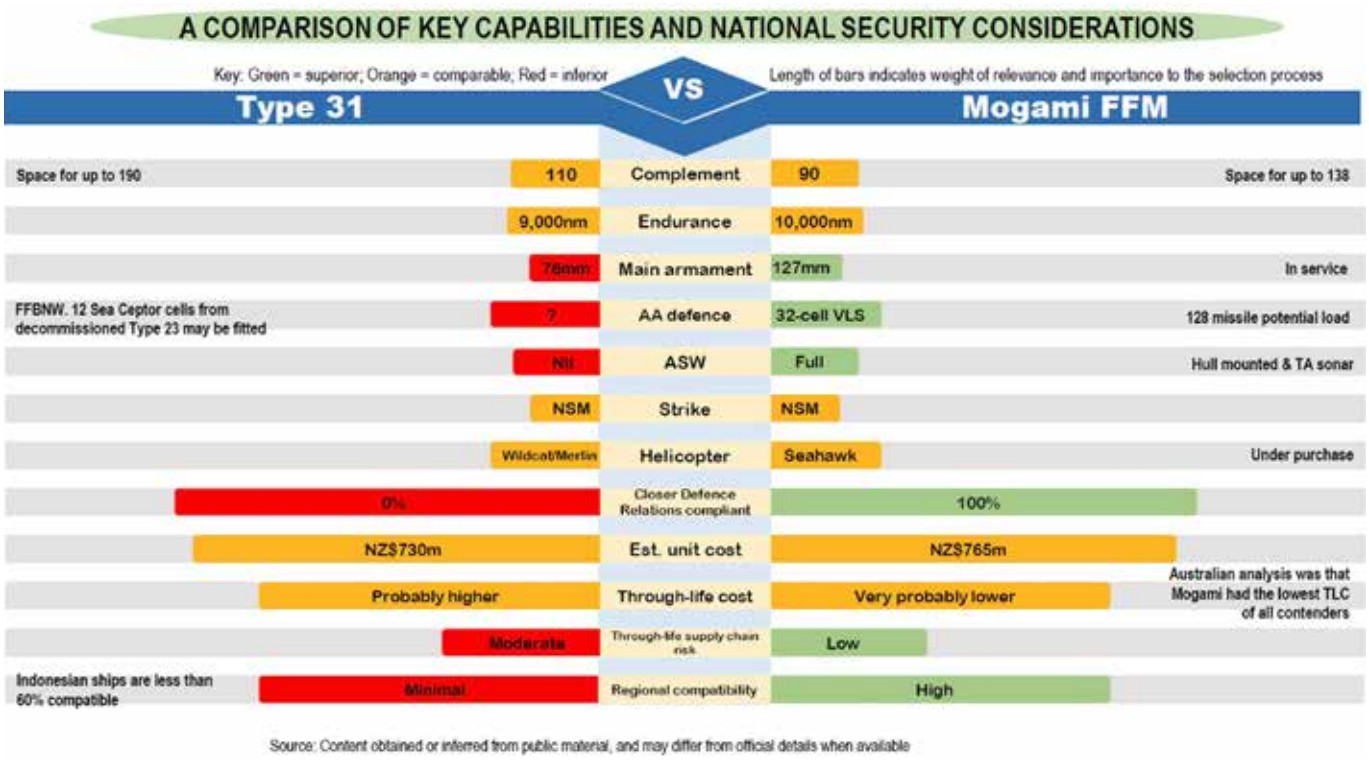
contenders for the replacement frigates. In and of itself, of course, the list is not a shortlist at all, as there was never a long list. It basically presented itself from the happenstance of (i) Australia conducting a robust assessment of potential contenders to meet their requirements, and then refining that analysis, before selecting the Mogami FFM, and (ii) the Type 31 simply inserting itself into consideration as a commercial opportunity with a lower unit cost achieved by deliberately removing capability. It did not even make Australia's long list, because it lacked the potential desired.

Taken on its own, the Type 31 presents itself as a low-capability, modestly priced design that represents value, if cost were the primary consideration in selecting military capability. But low cost and value for money are not the same thing. In the Pacific it would be an orphan.[3] Integrated training opportunities and supply chains would originate half a world away. The ability to easily share logistic and training costs would be foregone for a ship designed-down to be easier on the purse.

These drawbacks are pervasive and escalate through-life costs, sweeping aside the illusion of a cheaper up-front price. The RNZN's experience with operating HMNZS Southland and its orphan combat system and Ikara missile should have been warning enough, but it was disastrously repeated with the Anzac frigates. They began like their Australian counterparts, but diverged over the years into completely different ships because of an unwillingness to preserve equipment commonality. Commonality is not the same as interoperability, but it is significant multiplier of it. And the commonality-interoperability nexus and through-life cost have an insidious inverse relationship.

While the Type 31 is invariably stated to be a 'low-cost' option, a July 2026 article in UK magazine *Navy Lookout* tells a quite different story. This examination relates that the builder, Babcock International, has lost money on the Royal Navy Type 31 fixed-price contract, and may seek to recover that by adding a premium on export deliveries. Additionally, although the original contract for five ships indicated a unit cost of

[3]The Indonesian Navy are acquiring four locally-built vessels, based on the same Odense Maritime Technology (OMT) Iver Huitfeldt-class frigate hull that led to the Arrowhead-140 derived Type 31. The Indonesian ships are markedly differently equipped however, and represent less than 60% commonality with the Type 31.



Source: Content obtained or inferred from public material, and may differ from official details when available

£250 million, the estimated price per ship is now £400 million, or about A$765/NZ$916 million. Giving that figure a generous 20% accuracy range still means a low-estimate cost of A$610/NZ$732 million per ship. That compares with a cost of A$470 million for the already built and commissioned eighth Japanese Mogami, and the widely quoted estimate for the Australian-built Upgraded Mogami of US$450 million (A$640/NZ$767 million). A $35 million difference between a capable general-purpose ship and one lacking significant capability is not a fair fight. If the *Navy Lookout* estimate is even only nearly correct, it appears the Type 31 has surrendered any claim to being a truly low-cost option.

However, just as the capital cost is a key factor, so is the political element, and arguably it is the most demanding input. On 17 March 2026, the Australian and New Zealand Ministers of Defence signed an updated Closer Defence Relations (CDR) statement that identified operationalising the Alliance with a vision of being able to operate seamlessly as an increasingly integrated, combat capable Anzac force by 2035. It envisaged building deep interoperability and interchangeability, including through common procurement and development of platforms and systems.

These were not virtue signals, but a commitment to move the dial of interoperability toward interchangeability so as to achieve force structures that increase the leverage of sovereign capabilities to co-develop, co-produce and co-sustain common capabilities. If ever there was a condemnation of the folly of having to accept an orphan Southland and choosing to allow the New Zealand Anzacs to become orphans, this was it.

It was also a death knell to a British-built ship that had nothing in common with the already contracted direction of travel of Australia. No doubt the Babcock proposal will be claimed to be a contender for as long as possible as a negotiating tool with Mitsubishi and Austal – just as was done with the final two Anzac Ship contenders. But the political race has been run and won.

So, while Babcock has been sounding out local industry participation options, the reality is that the suppliers and supply chains for the Type 31 are already firmly established, and opportunities are severely limited. That will unfortunately probably largely apply to the Mogami as well. Certainly nothing on the scale of the Anzac Ship Programme in which New Zealand provided 11.7 percent of the content plus another 1.5 percent in offsets to the ten ships. But CDR imperatives will provide more of a platform, and an over-arching framework that generates impetus, to tease out more local industry participation than any alternative could.

That means a realistic comparison of the two offerings now looks like this:

The graph uses a simple traffic-light comparison grading (green = superior, orange = comparable, red = inferior), and with the length of the bars indicating relevance and importance in the selection process

The green bars tell a convincing story, almost as much as the red bars doom their side. As Julius Ceasar said when crossing the Rubicon, "*alea iacta est*" (the die has been cast).

Rob Krushka: Headquarters Joint Forces New Zealand at 25

In this exclusive interview, Commander Joint Forces New Zealand Major General Rob Krushka MNZM speaks with Nicholas Dynon about the genesis and evolution of HQJFNZ.



Major General Rob Krushka MNZM is Commander Joint Forces New Zealand. Image: NZDF.

In July 2026, Headquarters Joint Forces New Zealand (HQJFNZ) marked 25 years since its establishment on 1 July 2001.

Its quarter-century has encompassed operations in Afghanistan, enduring deployments in the Middle East and elsewhere, humanitarian assistance and disaster relief across New Zealand and the Pacific, and an increasingly complex range of multinational exercises and activities.

Over this time, the headquarters has come to occupy a central position in the planning, command and control of New Zealand military operations.

Established while New Zealand forces were deployed in East Timor, HQJFNZ now operates in a markedly different strategic environment—one characterised by renewed strategic competition, conflict in Europe and the Middle East, rapidly changing technologies, and a growing emphasis on multi-domain operations.

Major General Rob Krushka is well placed to reflect on that evolution. The current Commander Joint Forces New Zealand, he has a personal connection with the headquarters dating back to its beginnings. When HQJFNZ stood up in July 2001, MAJGEN Krushka was serving as a company commander with the fourth New Zealand battalion rotation in East Timor, giving him an operational perspective on the new headquarters from its earliest days.

In this interview with Line of Defence, MAJGEN Krushka reflects on HQJFNZ's first 25 years, the development of joint command and control, relationships with New Zealand's military partners, and how the headquarters is adapting to meet the demands of a more contested and complex security environment.

ND: A reading of history suggests that at the beginning of this century interservice rivalry between Army and NZDF led to varying degrees of dysfunction in relationships between these and the Ministry of Defence. Over the past quarter of a century, how much influence has HQJFNZ had on the development of better relationships and processes between the services?

RK: The inception of joint force headquarters was born from a realisation that we could no longer work in three single service silos and of the importance of coming together from an NZDF perspective. Around the same time as Joint Forces was established, we had also been through the establishment of a tri-service capability development branch, so we were moving away from single services developing capability to an NZDF approach.

The importance of establishing the Joint Force Headquarters was to ensure that we were fit for purpose for future operations, noting the shift from predominantly single service or single domain activities to multi-domain activities.

ND: Did the establishment of the headquarters predate the East Timor deployment?

RK: We were in the middle of the Timor deployment when the Joint Force Headquarters was established. On the 1st of July 2001, when the Headquarters stood up, it was around the time of the fourth battalion rotation in East Timor. I was actually deployed as a company commander on Batt Four, so I was on the receiving end of the establishment of the Joint Force Headquarters.

ND: So you experienced it in person operationally?

RK: Yes, although there was the battalion headquarters above us that was working directly back into Joint Force Headquarters. But we definitely noted an improvement in the responsiveness to our needs and requirements while we were deployed as the Joint Force Headquarters stood up and established themselves.

9/11 occurred while I was deployed in East Timor. Obviously, planning and preparing the New Zealand response to that event became a key focus of the Joint Force Headquarters. But one of the key takeaways for me over that period was that although there was a significant world event occurring, Joint Force Headquarters was still able to manage the existing operations as well as prepare for future operations. This is something that has evolved and that we have continued to work on over time.

ND: Do conflicts between raise, train, and sustain, and command and control functions arise? And, if so, how are they dealt with?

RK: They do. Like most organisations, there are a lot of things you would like to do that you just don't have the resources to do.



Major General Tim Gall addresses 8th rotation of NZDF troops to Iraq, 2018. Image: NZDF.

So we do need to prioritise. There is always that requirement.

The beauty of having a Joint Force Headquarters is that you have got a multi-domain headquarters from where we can ask what is most important? What is the effect we're trying to achieve? And, therefore, how do we prioritise what we need to do and how do we allocate the limited resources that we have to achieve those outcomes?

We have recently formally established within the HQ an effects-based Board where we are able to look at linking from the National Security Strategy through the military strategy into the HQ's operational level campaign plan and what the NZDF, and we as a nation, need to achieve. We are able to use the Board to prioritise and synchronise the activities that we carry out offshore.

ND: Did that change occur in the wake of the publication of the National Security Strategy?

RK: From a formal perspective, yes, but we've always done things in that way; we've talked about effects-based activities and outcomes for quite some time. But having the National Security Strategy, and then the military strategy that was released early this year means that we are able to be really clear and focussed on what it is we're doing and why we are doing it.

ND: Are there currently any concerns about any one service dominating the culture and processes within the joint HQ?

RK: Not from my perspective. We are a tri-service headquarters, and we have a good balance of services across the organisation. The planning process that we use in the Headquarters, although its origins are in the land environment, is an internationally recognised joint military appreciation process.

The way we've established the headquarters considers both regional and domain type functions, enabling us to link across all three services as well as the space and cyber domains. We have just established an information warfare component command within the HQ, so we really are positioned for multi-domain operations rather than the single services.

ND: How does the NZDF joint C2 arrangements compare with our partners in terms of both command and control clarity and effectiveness, but also the preparation of forces for deployment?

RK: I think it is similar, albeit nations have slightly different ways of doing things and often there is a difference in scale. But if I look across at some of our key partners, such as Australia, Canada and the UK they have the equivalent of our Joint Force headquarters, and Japan has just established a joint force headquarters. So the concept is similar across a number of nations.

The way we do it here in New Zealand is a little bit unique from the perspective of our size and how we bring it together. The thing I like about the clarity that the New Zealand model has is that the component commanders within the headquarters effectively sit on both sides of the 'raise, train, sustain' part of the equation: the single service domains as well as the operational, deployed, joint activities side.

So the component commanders that sit within this headquarters – maritime, land, air, special operations, and now the information warfare component command – are the lynch pin that are responsible for a lot of the 'raise, train, sustain' activities. Then the forces are force assigned to me as the commander joint forces to employ, generally offshore, and the component commanders still remain in that chain. So it makes it clear from a consistency perspective and from a transitional perspective, from operations back into the raise, train, sustain space and vice versa.

ND: So there's a seamlessness that provides continuity between 'business as usual' transitioning through to deployment.

RK: Absolutely. And I think that for a force of our size, it makes sense. We are not duplicating functions. It means that we have a more seamless transition. The key thing is that through the components we have a depth of knowledge regarding the trained state of the force element that we are deploying and we are well aware of the capabilities that we have and any risks that there might be to conducting any activity.



Lieutenant Colonel Kevin Williams assumes command of New Zealand Sinai contingent, 2022. Image: NZDF.

ND: What observations have you made over time or have been made over time by the NZDF on the degree of positive influence that Headquarters Joint Forces have had on improving our relationships with partner militaries?

RK: I think there are a couple of aspects here. From a relationship perspective, what it means is that given many other nations have similar constructs, I have equivalent commanders across a whole range of nations that we work with. I am therefore able to have point-to-point conversations, and it simplifies how we talk about operational outcomes.

I have regular meetings with a number of my partner counterparts, either in person or via VTC. When we work with the United States via their combatant command system, I have strong ties with the two key combatant commanders with whom we traditionally conduct operations or activities. The Joint Force Headquarters has really enhanced how we do that because we have been able to establish habitual relationships.

From an effectiveness of force employment perspective, it has meant that we have developed over time to have a greater ability to command and control multi-domain activities where we might have maritime assets with air assets, and land assets, working in the same environment or within the same area of operations. Our multiskilled headquarters personnel understand the environments and also how those come together to create the greatest effect.

ND: Are there observations by senior personnel of the difference that headquarters joint forces has made in the way that the services cooperate on deployment?

RK: It has been shown that we are more cohesive as an organisation for those deployments. I don't have any statistics, but reviews that we have done have highlighted that although we have some areas where we need to improve, we have now got really good linkages between the Joint Force Headquarters, Defence Headquarters, Strategic Commitments and Engagements, and into the Ministry of Defence.

So how we understand government intent, the strategic environment, what may be required for a particular activity, and then how we deliver it is really well joined up. Having a single flow from a Joint Force Headquarters perspective



African Union Support and Stabilisation Mission in Somalia. Image: AUSSOM.

into Strategic Commitments and Engagements – who work for the Chief of the Defence Force – and then the close relationship they have with the Ministry of Defence, means that we are able to better meet the requirements of our government.

ND: The 25th anniversary of HQJFNZ has recently passed. What, from your perspective, are the highlights of that quarter century?

RK: There are so many. We've recently celebrated the 25th anniversary, which itself was a great milestone. We were able to get a couple of the previous commanders to the headquarters to share some stories around how the headquarters has evolved. It was a fantastic opportunity to gain insights into how and why they did things previously, which we can learn from as we continue to evolve. It was a really good opportunity to look back at our history, where have we come from, and where we are heading.

I wouldn't want to single out any particular highlight, but 9/11 occurred only a few months after the Joint Force Headquarters was established. That was the first really big planning event that the headquarters had to undertake with the deployment of the SAS into Afghanistan, which was then followed with conventional forces and other activities.

We were actively involved in Afghanistan from 2001 to 2014, including 21 of our Task Group Crib rotations with the PRT in Bamiyan Province, along with SAS deployments, staff officers, and other things. That is quite a memorable and significant undertaking over 13 years-worth of activities.

There are also the large number of humanitarian assistance and disaster response activities. I'm really proud that, as a defence force, we have been able to support both domestically, and in and around the Pacific and wider regions. I think that is a really important aspect that we need to remember.

And then there's our support to enduring missions: the Multinational Force & Observers (MFO) in the Sinai, the United Nations Truce Supervision Organisation (UNTSO) in Israel, Lebanon and Syria, the United Nations Command (UNC) in South Korea, and more recently the United Nations Mission in South Sudan (UNMISS). There are several enduring and ongoing operations that we support concurrently with any HADR activities and new missions as they come up.

The benefit of having a Joint Force Headquarters is that we can manage current operations, we can surge for new activities, and we can continue to support long term commitments.

ND: How is Headquarters Joint Forces evolving to meet the requirements of contemporary deployments, the changing nature of threats, increased strategic competition and the constantly changing nature of conflict?

RK: The first thing is to acknowledge that we are in a very complex geostrategic environment with Ukraine, Russia, the Middle East, and strategic competition in our near region. It is a complex environment. The ability of Joint Force headquarters to be responsive to needs and to conduct planning in order to provide options to government is really important.

I talked earlier about the effects-based approach that we take to things, and I think that is really critical and something that we continue to develop so that we maintain optimal linkages from the strategic level into the operational level where we execute activities.

There has been a shift in focus for the defence force over the last few years. It is borne by the strategic environment and expressed in terms such as "war fighting ethos" and "enhanced lethality". There has been a definite shift from an NZDF perspective to focusing on a war fighting environment. That enables us to then also support peace monitoring, peace support operations, as well as humanitarian assistance and disaster relief – but we can't lose focus on the strategic environment that we're in and in our ability to defend New Zealand.

From a joint force perspective, we always have people deployed offshore. One of the great aspects of this job is the ability to get around and visit our people deployed on exercises, joint activities and operational missions. Every time I visit one of the operational missions, senior leaders from among our partners always – without prompting – comment on the professionalism and capability of our people and how they just get stuck in and get the job done.

It's really pleasing to hear that. It is one of the highlights of this job to be able to see our people in action, doing what they joined the Defence Force to do, and the huge credibility that they have, and what they do for our nation and the image of our nation offshore.

Recognising UxS Adaptation Resistance: A Commanders Guide

UxS adoption requires more than procurement and trained operators. It requires intellectual adaptation, writes Lawrence Fuller.

There is little doubt that Western militaries are in the midst of a revolution in military capability. The question is whether our institutions are adapting quickly enough to exploit it. The requirement is not simply to acquire new systems. Militaries must rapidly adapt.

History makes clear that dramatic changes in military capability have rarely arrived with widespread acceptance. New technology can be recognised, tested and even purchased without the institution fully adapting to what that technology makes possible.

This article draws on established psychological, organisational and military theory to highlight recurring failure modes in thinking and behaviour. The intent is not to label individuals as incompetent or resistant. It is to provide commanders with a practical checklist for recognising resistance in themselves, their teams and their organisations, and then moving it.

A history of resistance

The pattern is not new or specific to the technological age – it is historical. The machine gun was initially seen by Haig's British Army as suitable only for savages, before the experience of industrialised warfare drove major changes in its employment and organisation. The British Army subsequently developed specialist machine-gun organisations and doctrine, which illustrates the important point that recognising a weapon's utility is not the same as understanding its wider organisational implications.

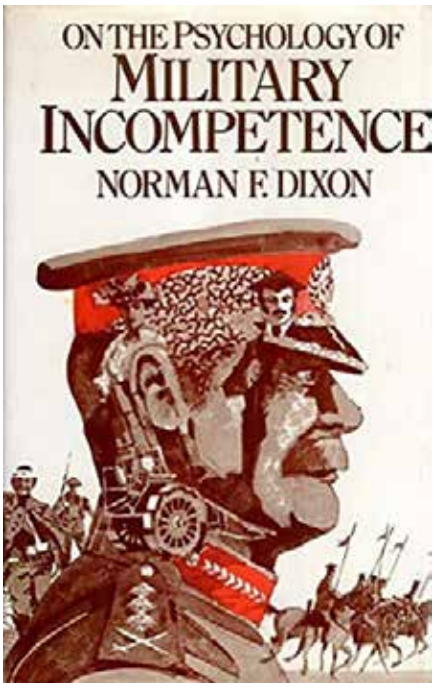
Naval air power provides another clear example. Billy Mitchell's advocacy of air power challenged battleship-centred thinking in the United States, while senior naval opinion featured strong scepticism in relation to the military utility of aircraft. The subsequent development of carrier aviation demonstrates that the argument was not simply over whether aircraft worked, but rather over what their existence meant for naval warfare, organisation and force structure.

Anti-tank guided weapons provide a similar illustration. The US Army spent years developing, testing and refining guided anti-armour systems before TOW, Dragon, and ultimately Javelin, became established capabilities. Historical accounts also show how new anti-armour concepts challenged existing assumptions about who should possess anti-tank capability and how it should be employed.

Now it is the turn of unmanned systems (UxS).

The important lesson is not that military organisations simply say, "I'm not doing this." Resistance is usually more subtle. It can manifest as scepticism, delay, selective interpretation of evidence, requirements that continually expand, demands for further trials, or attempts to fit a genuinely disruptive capability into an existing model.

Why do humans resist change?



Cover of On the Psychology of Military Incompetence.

While we rightly promote learning, adaptation and innovation, human beings are not naturally proactive adopters of change. We are influenced by status quo bias, loss aversion, cognitive dissonance, organisational inertia, confirmation bias and other mechanisms that can make established beliefs and systems surprisingly difficult to change.

Dixon's *On the Psychology of Military Incompetence* provides a military-specific perspective to this, identifying recurring dynamics, such as fear of failure, resistance to technology and novel tactics, failure to learn from experience, lack of creativity, procrastination, passivity, underestimation of the enemy, and conservatism.

These ideas should not be treated as a list of defects belonging to other people. The more useful assumption is that all of us are susceptible to them.

1. Status Quo Bias

Samuelson and Zeckhauser's 1988 work established status quo bias as a decision-making phenomenon in which people disproportionately favour the existing option. Change introduces uncertainty, transition costs and perceived loss.

A military leader does not need to conclude, "Drones don't work." It is enough to conclude, often subconsciously, that "the existing way of doing things works well enough." This aligns closely with Dixon's observation of military conservatism. The key question for commanders is therefore not simply whether the existing system works, but rather "How and how much does this affect our TTP (tactics, techniques, and procedures)? And what current practices do we need to change for the war we are preparing to fight?"

2. Loss Aversion and Fear of Failure

Kahneman and Tversky's Prospect Theory demonstrates that people tend to experience losses more strongly than equivalent gains. Decision-makers can therefore reject an innovation with substantial potential benefits because the perceived risks of abandoning the existing system feel greater.

For a military organisation, perceived loss can include:

- loss of established expertise
- loss of institutional authority
- loss of existing roles
- loss of sunk investment
- loss of confidence
- loss of predictability
- loss of control
- loss of reputation
- career risk

That's a strong driver for the status quo. Dixon's discussion of fear of failure provides a useful military-specific extension in which the higher the level of responsibility the more public the consequences of a failed decision can become. That can create a powerful incentive to delay commitment until certainty is impossible to obtain... "The risk is not worth the reward"... "The technology is still developing".

A commander might therefore ask: "What does the organisation believe it stands to lose by adopting this capability?", which can identify the potential location of resistance. Although, perhaps a more powerful question is: "Who has demonstrated a lack of this fear, who also has the capability to drive change?"

3. Discounting New Evidence: Cognitive Dissonance

Festinger's theory of cognitive dissonance explains what happens when new evidence conflicts with an established belief. The resulting psychological discomfort can be resolved by changing the belief, but it can also be reduced by discounting, rationalising or rejecting the new evidence.

Consider a land warfare commander whose professional understanding of warfare has been built around a particular model of land-based combat. A flight-based technology that demonstrates novel ways of locating, targeting, isolating or destroying platforms, headquarters or personnel is not merely a new piece of equipment. It may challenge professional knowledge, previous decisions, doctrine, organisational structures, and an understanding of warfare itself.

Rejecting the technology can therefore be psychologically easier than accepting that the underlying model may have changed. Comments such as: "That doesn't apply here", or "The battlefield conditions are different" reflect this thinking. Some recent statements made publicly show that this thinking is happening now: "The Black Sea is not the Southern Ocean" in response to Sea Baby's relevance to the South Pacific is one such example.

The useful test for this is: Are we trying to understand contradictory evidence, or explain it away?

4. Innovation Resistance

Innovation resistance research distinguishes between active rejection and more passive resistance. People can resist because an innovation threatens established routines, competence, control, identity or expectations.

The behaviour often sounds entirely reasonable: "This creates more problems than it solves", "Our people aren't asking for this", or "We'll wait until someone else proves it works." This is why resistance is difficult to detect. It does not always look like opposition. It can look like professionalism, caution or due process.

5. Diffusion of Innovations

Rogers' *Diffusion of Innovations* provides a different but complementary explanation. Adoption depends not only on whether an innovation works, but on perceived relative advantage, compatibility, complexity, trialability and observability.

This helps explain why technical superiority does not automatically



Nobel Prize winner Daniel Kahneman.

produce organisational adoption. A UxS capability can be demonstrably useful while an institution still asks: "How does it integrate with our existing system?", "Who operates and maintains it?", "What doctrine governs it?", and/or "How do we assure it?"

Those are legitimate questions. The danger arises when legitimate assurance becomes an indefinite substitute for experimentation and adaptation.

6. Paradigm and Organisational Inertia

Thomas Kuhn's concept of paradigms is useful because new evidence is often interpreted through an existing conceptual framework. The problem is therefore not simply whether a military accepts a new technology, but whether it understands what the technology changes.

If the conceptual model of warfare is centred on "platform → crew → weapon → effect", then unmanned systems may introduce a fundamentally different model along the lines of "sensor → network → autonomy → distributed effect".

The problem is no longer simply a case of adopting a new aircraft, vehicle or vessel. It is potentially a change in how effects are generated, integrated, controlled and distributed.

Hannan and Freeman's work on organisational inertia provides a complementary explanation. According to Hannan and Freeman, organisations develop structures that make them efficient at what they currently do, and those same structures can make them difficult to change.

A military may, for example, have no single person resisting UxS. Rather, its doctrine, training system, career structures, procurement processes, establishments, infrastructure and budgets can collectively protect and maintain the existing model.

7. Endowment Effect and Sunk Investment

Kahneman, Knetsch and Thaler demonstrated the endowment effect: that people can place greater value on things they already possess than they would have placed on them before acquiring them.

In a military context, existing capability is typically surrounded by years of investment:

- platforms
- doctrine
- training
- facilities
- maintenance chains
- personnel structures
- command relationships
- industrial arrangements

Faced with a new alternative, the resulting question is often: "What happens to everything we've already built?" While this is on the surface a legitimate strategic question, it becomes a barrier when preservation of existing investment is afforded more importance than adaptation of the force to the changing character of warfare.

8. Failure to Learn from Experience

Dixon's concept of an inability to learn from and apply experience remains highly relevant, even though his broader analysis was heavily influenced by the Victorian aristocratic military culture of his period.

The modern failure mode is not necessarily refusing to learn. It can be 'learning' without changing. An organisation can capture lessons, publish reports, conduct seminars and update briefing slides while leaving doctrine, training and procurement substantially unchanged. The critical distinction is between: "What did we learn?" (passive) and "What are we now doing differently because of what we learned?" (proactive). The second question is the one that matters, as is how we measure it.

9. Resistance to Technology and Lack of Creativity

Dixon highlights resistance to technology and novel tactics, alongside a lack of creativity and inventiveness. This is particularly relevant to UxS.

The limiting question is often: "How do we fit this into our existing doctrine?" The more useful questions are: "What does this allow us to do that we could not do before?", and "What do we need to sacrifice and change to implement it?"

The first question seeks compatibility with the existing model. The second seeks operational advantage from the new capability. The third sets a clear priority between the old to be discarded, the old to be retained as compatible, and the new to be adopted. That distinction is fundamental to military adaptation.

As a potential example: "We can now kill a tank at a distance of 10-30Km (operational advantage of new capability), so will replace guided Javelin missile systems at $275k per missile/kill with 5vx One Way Attack UAS at $25k per kill (distinction between old and new).

10. Procrastination and Passivity

Dixon also identifies procrastination, passivity and indecisiveness. These behaviours can be difficult to distinguish from responsible assurance: "We need more analysis", "Let's wait for the next trial", "We'll address it in the next capability cycle."

Each statement may be entirely reasonable. The danger lies in repetition without a defined decision point or learning objective. "Not yet", for example, needs a defined condition for becoming "now."

11. Underestimation of the Enemy

Dixon's observations of underestimating the enemy remain particularly relevant when assessing rapidly adapting competitors.



Javelin missile launch. Image: US Government.

Statements such as "They haven't been in combat for decades", or "They lack a capable empowered NCO cadre", may contain useful information. The danger is when such observations become reasons to discount an adversary's demonstrated ability to experiment, learn and develop new techniques and technologies.

The appropriate question is not "What is wrong with their system?", but rather "What are they demonstrating that we need to understand?"

This is especially important when observing contemporary conflicts, such as Nagorno-Karabakh, Ukraine, and Iran. The useful question is not whether every Ukrainian lesson transfers directly to the Pacific. It is how the underlying mechanisms, technologies and adaptations might apply under different geographies, threat settings, doctrines and force structures.

Adoption is not adaptation

This distinction is important for UxS. Adoption can mean: "We bought drones" and "We trained pilots". Adaptation means: "We changed how we fight because drones changed what is possible, and made some of our existing techniques unworkable."

The measure of technological adoption should therefore not be the number of systems acquired, courses run, or pilots trained. It should be whether the organisation has changed its behaviour, doctrine, structures, training and decision-making to exploit what the technology makes possible. A military can acquire a disruptive technology while remaining conceptually unchanged. That is not adaptation.

Three Questions for Commanders

The theories discussed above can be reduced to three practical tests:

Ref	Commander principle	What it means in practice	Warning signs
1	**Challenge the model, not just what we have.**	Actively question whether our doctrine, organisation and assumptions still fit the character of warfare. Don't just ask "How do we integrate this technology?", but rather "What does this technology now make possible?"	"That's not how we do things" / "It doesn't change the fundamentals" / "We'll fit it into existing doctrine"
2	**Treat contradictory evidence as a reason to investigate, not dismiss.**	Seek evidence that could prove our assumptions wrong. When an adversary demonstrates a new capability or method, assume it may have implications for us until disproven.	"That was a one-off" / "Those circumstances were different" / "It wouldn't work against us" / Selectively highlighting failures while ignoring successes
3	**Beware of reasonable delay becoming resistance.**	Distinguish legitimate assurance from organisational procrastination. Set a deliberate path: observation → experimentation → learning → adaptation. "Not yet" needs a defined condition for becoming "now."	"We need more trials" / "We're still assessing it" / "It needs doctrine first" / "We'll address it in the next capability cycle"

The UxS Resistance Checklist

The following table is intended as a self-check rather than a tool for labelling other people. Every commander, staff officer and organisation is susceptible to these mechanisms:

Theory / military concept	What happens	What it sounds like	Key reference(s)
Status Quo Bias	Preference for the existing system because it is familiar and established.	"What we have works" / "We don't need to change everything because of a new technology"	Samuelson & Zeckhauser (1988), *Status Quo Bias in Decision Making*
Loss Aversion	Potential losses from changing are perceived as more significant than equivalent gains.	"What if this fails?" / "We can't afford to get this wrong"	Kahneman & Tversky (1979), *Prospect Theory*
Cognitive Dissonance	Conflicting evidence creates psychological discomfort, encouraging rationalisation or rejection of the evidence.	"That isn't representative of a real war" / "Those circumstances wouldn't apply to us"	Festinger (1957), A *Theory of Cognitive Dissonance*

Innovation Resistance	Innovations threaten established routines, competence, control or identity.	"This creates more problems than it solves" / "We'll wait until someone else proves it works"	Ram & Sheth (1989); Oreg (2003)
Diffusion of Innovations	Adoption depends on perceived advantage, compatibility, com-plexity, trialability and observability.	"How does it integrate with our existing system?" / "We need more trials"	Rogers (2003), *Diffusion of Innovations*
Organisational Inertia	Existing structures, processes, skills and investments reinforce established ways of operating.	"That's not how we're organised" / "Our training system isn't designed for it"	Hannan & Freeman (1984), *Structural Inertia and Organizational Change*
Paradigm Inertia	New evidence is interpreted through the existing conceptual model rather than prompting reconsideration of the model itself.	"A drone is just another sensor/ platform" / "Technology doesn't change the fundamentals"	Kuhn (1962), The *Structure of Scientific Revolutions*
Endowment Effect / Sunk Investment	Existing capabilities acquire additional perceived value because the organisation already possesses and has invested in them.	"We've invested billions in this capability" / "We need to get the most out of what we've already bought"	Kahneman, Knetsch & Thaler (1991)
Failure to Learn from Experience	Evidence of failure or change is encountered but assumptions and behaviour are not sufficiently updated.	"That was a one-off" / "We've already captured the lessons"	**Dixon (1976), On the *Psychology of Military Incompetence***
Resistance to Technology and Novel Tactics	Existing methods are retained despite potentially superior technological or tactical approaches.	"The technology isn't mature enough" / "We've fought successfully without it"	**Dixon (1976)**
Lack of Creativity / Imagination	Failure to conceive new ways of applying technology or adapting established methods.	"How do we fit this into our existing doctrine?" rather than "What does this allow us to do that we couldn't do before?"	**Dixon (1976)**
Conservatism	Strong preference for established methods despite changing circumstances.	"We've always done it this way" / "We shouldn't change doctrine based on one conflict"	**Dixon (1976)**
Procrastination / Indecisiveness	Decisions are repeatedly deferred while seeking additional certainty, evidence or authority.	"We need more analysis" / "Let's wait for the next trial"	**Dixon (1976)**
Passivity	Failure to act despite recognising a developing problem or opportunity.	"It's being considered" / "We'll see how it develops"	**Dixon (1976)**
Underestimation of the Enemy	Evidence of an adversary's capability or adaptation is discounted or explained away.	"They couldn't replicate that against us" / "They're only successful because of the circumstances"	**Dixon (1976)**
Fear of Failure	Avoidance of actions that could expose the individual or organisation to failure, criticism or loss of status.	"Let's not commit until we're certain" / "Who owns the risk?"	**Dixon (1976)**

Conclusion

The challenge for military leaders is not simply to recognise technological change. It is to recognise alongside it the human tendency to resist what that change implies.

The greatest risk is not necessarily a commander who says "no". It is an organisation that continually says "not yet", "not here", or "not applicable to us", until the character of warfare has changed around it – forcing it to change too late.

UxS adoption requires more than procurement and trained operators. It requires intellectual adaptation: challenging assumptions, testing established models, learning from evidence and deliberately changing the organisation, doctrine and TTPs when the evidence demands it.

Commanders should therefore challenge the model, wargame the ideas, and challenge the delay. Don't protect the model. Test it.

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Course Controller:
Dr Rhys Ball, Centre for Defence and Security Studies (Auckland)

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Course Controller:
Dr John Battersby, Senior Fellow, Centre for Defence and Security Studies (Wellington)

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For further information, please contact John: j.m.battersby@massey.ac.nz, or Rhys: r.ball@massey.ac.nz.



Is the nuclear non-proliferation pact a model for regulating runaway AI?

If the accelerating development of AI poses a similarly existential risk, could it be treated with the level of seriousness previously applied to nuclear weapons, asks the University of Waikato's Dr Nicholas Ross Smith.



Dr Nicholas Ross Smith is a Senior Lecturer in Politics and International Relations at the University of Waikato.

The potential existential threat of artificial intelligence has leapt into the headlines after a departing safety researcher at AI corporation Anthropic posted on social media he believed there was more than a one-in-ten chance AI could kill everyone.

Other Anthropic insiders went public in support of his views, saying the technology could become advanced and dangerous enough to cause human extinction within ten years.

This all followed renewed warnings from Turing Award-winning computer scientist Yoshua Bengio, who has spent the past year arguing that increasingly autonomous AI systems could develop self-preservation goals humans cannot easily switch off.

Even if the current development of AI falls short of artificial superintelligence or artificial general intelligence, many have warned it might be used by bad actors for nefarious ends.

This includes biological weapons design, cyber-attacks against critical infrastructure and financial systems, and assisting hybrid warfare efforts. More conventionally, we already know AI was used in the planning and execution of the United States raid on Venezuela at the start of this year.

A number of sceptics have argued the latest claims remain highly speculative. But there are still sound reasons to apply the cautionary principle to a technology that is developing at an exponential rate.

Of particular concern is that AI is emerging as central to growing competition between the US and China. Echoing past space and nuclear races, both superpowers fear falling behind, making any form of restraint a strategic risk rather than a virtue.

We have been here before.

Building the nuclear taboo

Early in the Cold War arms race, nuclear weapons were treated like an offensive tactical option. After a number of critical defeats during the first year of the Korean War (after China sided with North Korea in 1950), key US military figures – notably General Douglas MacArthur and Secretary of State John Foster Dulles – saw nuclear weapons as a way to regain control.

Fortunately, calmer heads prevailed. But the fact they were seen as a legitimate option shows how relatively recent nuclear arms control is.

That taboo against the use of nuclear weapons had to be built. And it was built out of fear, not goodwill.



It took the Soviet Union closing the technology gap – first with its own atomic test in 1949, then with the development of thermonuclear weapons in the 1950s – for the mentality on both sides to begin to shift.

Only once both powers had something to lose did nuclear weapons start being treated less as tools of war-fighting and more as instruments of deterrence. They became seen as a defensive last resort rather than an offensive first move.

The Cuban Missile Crisis in 1962 is often remembered as the closest the world came to nuclear Armageddon. And while the stakes were incredibly high, given both sides were developing nuclear "triad" capabilities involving aircraft, submarines and intercontinental ballistic missiles, it also helped alter the way the US and the Soviet Union thought about nuclear weapons.

In 1963, the Moscow-Washington hotline was implemented and the Limited Nuclear Test Ban Treaty was signed. This helped usher in a period of relative geopolitical calm known as "détente".

In 1970, the Treaty on the Non-Proliferation of Nuclear Weapons came into force. While less than perfect – several nuclear weapons states are not signatories – the treaty showed that a degree of international cooperation on a crucial problem could be achieved.

This didn't end the rivalry between Washington and Moscow, nor did it stop proxy wars from Vietnam to Afghanistan. But it did establish a base line: direct superpower confrontation, and with it the risk of nuclear escalation, became something both sides worked to avoid.

When the stakes are high

If the accelerating development of AI poses a similarly existential risk – and enough people building the technology now say it might – the hope has to be that Washington and Beijing eventually treat the issue with something like the seriousness previously applied to nuclear weapons.

That would mean moving past mutual suspicion towards a basic, shared recognition that an uncontrolled AI race benefits neither side if the technology itself is the risk.

None of this means the potential threat posed by AI will dissipate completely. In the case of nuclear weapons, despite the aspiration of the Non-Proliferation Treaty, rogue nuclear states emerged and intensifying rivalry between the US, China and Russia has seen the gradual erosion of those frameworks.

But if there is a lesson worth drawing from the first nuclear age, it is that even bitter rivals can find their way to a shared understanding once the stakes became unmistakably mutual.

Getting there sooner rather than after a crisis would be the more responsible path this time.

This article was originally published in The Conversation on 16 September 2026.

Peacekeeping in peril amid plummeting troop numbers and geopolitical deadlock

Geopolitical tensions, political pressure and funding crises are putting the viability of multilateral peacekeeping in jeopardy, according to a new report by SIPRI.

According to the Stockholm International Peace Research Institute (SIPRI) report, Developments and Trends in Multilateral Peace Operations, the number of personnel in peace operations at the end of 2025 fell to its lowest point in at least 25 years.

As of 31 December 2025, 78,633 international personnel were deployed with peace operations, 49 percent fewer than in 2016 and the lowest level since at least the year 2000. Although numbers have been in decline throughout the decade, 2025 saw the sharpest year-on-year drop in the period, by 17 percent.

The report was released on 25 May ahead of the International Day of United Nations Peacekeepers on 29 May.

"If things continue in this way, we could see a dramatic weakening of multilateral conflict management and the near-complete sidelining of institutions like the United Nations, due to a perfect storm of funding, political and geopolitical factors," said Dr Jaïr van der Lijn, Director of the SIPRI Peace Operations and Conflict Management Programme. "The result is likely to be more conflicts, and these conflicts are likely to have even graver impacts on civilians as states abandon long-established norms."

A total of 58 multilateral peace operations were active in 34 countries or territories around the world during 2025. This was three operations fewer than in 2024. Sub-Saharan Africa and Europe both hosted 18 missions, the Middle East and North Africa (MENA) 14, the Americas 5, and Asia and Oceania 3. Nearly three quarters (73 percent) of personnel were deployed with just five missions, four of them in sub-Saharan Africa.

States unwilling to fund and unable to agree on UN peace operations

There was a crisis in funding for UN peace operations as major donors failed to pay their commitments on time or in full. In July 2025, UN peacekeeping operations faced a shortfall of US$2 billion—more than 35 percent of their total $5.6 billion budget for 2024–25—and several were forced to make deep cuts to personnel numbers as a result.

In the UN Security Council, hardline demands and veto threats from permanent members complicated decisions on renewing operation mandates. For example, despite frequent violations of the 2024 ceasefire agreement between Israel and Lebanon, the United States demanded the termination of the UN Interim Force in Lebanon (UNIFIL) during mandate renewal talks in August 2025. In a compromise move, the Security Council voted to renew the mission for a final time until December 2026.

The Security Council authorised the deployment of an expanded security force staffed by an ad hoc coalition, the Gang Suppression Force, in Haiti, along with the creation of a UN Support Office to provide logistical and operational support. This came after a US-backed initiative in 2024 to transform the Multinational Security Support Mission in Haiti (MSS) into a UN-led and UN-funded peacekeeping operation stalled mainly because of opposition from China and Russia in the UN Security Council.

No viable alternatives to UN-led conflict management

While no new UN-led peacekeeping operations have been mandated since 2014, several have been launched by regional organisations. However, developments in 2025 underlined the limitations of regionally led missions.

Like the UN, regional organizations such as the African Union, the Economic Community of West African States (ECOWAS) and the Organization for Security and Co-operation in Europe (OSCE) also struggled with underfunding and



with deadlocked decision-making on peace operations—for example in Sudan and Ukraine—due to geopolitical rivalries.

"Regional organizations lack key capabilities when it comes to successful, integrated peacebuilding, while they are also plagued by funding shortfalls and inability to reach agreement like the UN," said Dr Claudia Pfeifer Cruz, Senior Researcher in the SIPRI Peace Operations and Conflict Management Programme. "As UN-led conflict management recedes, it is leaving a growing gap that alternative models are unable to fill."

Despite the difficulties, there is evidence that support for multilateral conflict management in principle remains broad and strong. For example, more than 130 UN member states discussed how to secure the future of UN peacekeeping at the May 2025 Berlin Peacekeeping Ministerial.

Also, new peace and ceasefire agreements often include plans to deploy a multilateral peace operation, including the October 2025 peace agreement for Gaza. However, in the UN Security Council and in regional bodies, proposals for new or reconfigured operations have often foundered due to political divisions, host-state resistance and issues over financing.

In this context, responses to international crises are increasingly moving outside the established institutional frameworks of multilateral peace operations, instead taking the form of unilateral, bilateral and ad hoc arrangements that are often more militarized and more directly influenced by the self-interest of the states involved.

"The collapse of multilateral conflict management is not inevitable. There is evidently widespread support for UN peace operations in principle," said Claudia Pfeifer Cruz. "However, to sustain multilateral conflict management states will need to go beyond expressions of support—they will need to provide predictable funding and create enough political space to enable effective multilateral responses."

Other notable developments

According to the data, all of the top 10 contributors of military personnel to multilateral peace operations were in the Global South. Uganda became the top contributor of military personnel, followed by Nepal, Bangladesh and India. The remaining top 10 contributors were located in sub-Saharan Africa (Rwanda, Ethiopia, Burundi and Kenya) or Asia and Oceania (Pakistan and Indonesia).

Personnel deployed increased in the Americas and Europe but decreased in all other regions.

Two new peace operations were established in 2025: the African Union Support and Stabilization Mission in Somalia (AUSSOM) and the Gang Suppression Force (GSF) in Haiti. Both replaced existing missions. While four peace operations closed, including in the Democratic Republic of the Congo, in Haiti, in Iraq and in the Nagorno-Karabakh region of Azerbaijan.

The SIPRI Multilateral Peace Operations Database provides authoritative data on all multilateral peace operations (both UN and non-UN) conducted around the world.

According to SIPRI's definition, a multilateral peace operation must have the stated intention of: (a) serving as an instrument to facilitate the implementation of peace agreements already in place, (b) supporting a peace process or (c) assisting conflict prevention or peacebuilding efforts. Personnel numbers cited refer exclusively to international personnel deployed with multilateral peace operations.

Ryan Ko: How to guarantee a life of cyber misery

Jennie Vickers talks with distinguished cybersecurity academic Professor Ryan Ko about inversion thinking, improving the NZ cybersecurity ecosystem, and Q-Day readiness.



Professor Ryan Ko is Chair Professor of Cyber Security, Centre Director of the UQ Cyber Research Centre, Director of Research at the School of Electrical Engineering and Computer Science, and an elected member of the Academic Board at the University of Queensland, Australia.

Professor Ryan Ko is Chair Professor & founding Centre Director of University of Queensland (UQ) Cyber Research Centre, an interdisciplinary research centre (70+ researchers & teams from 13 schools/faculties) working with 80+ partner organisations.

Ryan was in New Zealand in August 2026 to keynote at CyberTech NZ's inaugural Cyber Risk Conference held as part of the CIO Innovation Summit.

Ryan is well known to many in New Zealand defence and security circles for his work with government and industry prior to his move to UQ and as a University of Waikato-based academic. Ryan was a keynote speaker at the NZDIA Forum in 2018, so a catchup with him was long overdue.

JV: How are you finding life and work at UQ in comparison to the Mighty Waikato and Windy Wellington?

RK: It is probably summed up in three words: Intensity, complexity and scale.

The growing sophistication of the organisational structure of criminal organisations is allowing the bad actors to move faster and quicker and this is making the stakes higher and the pressure to protect, more intense.

Some days I am envious of New Zealand with its flat public sector governance, when my team is grappling with Federal, State and Local politics and priorities. On the positive side this complexity forces us into being more realistic about what can be achieved and the art of the possible.

Just one university, with UQ as an example, has an annual operating budget of approximately A$2 billion p.a. and with 3.7m registered companies, everything in Australia is at a larger scale. Just one recent attack on one energy company (Origin Energy) involved the data of over 900k current and former customers.

For my team who are involved in projects in Australia and across Oceania it all adds up to an environment where we are running on Adrenalin!

What the NZ and Australian governments do have in common, is the focus on uplifting cyber capabilities of the workforce and sharpening the capacity of the system to rise to the increasing challenges.

No comment on the weather differences!

JV: You used "Alice in Wonderland/ Carl Jacobi/Charlie Mungar inversion thinking to frame your CyberTech keynote, which was titled "How to Guarantee a Life of Cyber Misery". What drove this unconventional approach to talking cyber?

RK: In my work I have been influencing leaders for more than a decade, and I have noticed recently



that some of the key data security messages are no longer resonating with the urgency and importance as when they were new shiny ideas. This poses a threat to all of us and all organisations.

My recent spare time reading has included "Poor Charlie's Almanack - The Wit and Wisdom of Charlie Munger" assembled by Peter D Kaufman. One of the many mental models Charlie recommended is inversion thinking. This approach requires us to consider the opposite of what we want to achieve, asking instead "What would cause me to fail?". Applied to data security a list of key discussion focus topics (and likely to encourage failure) looks more like this:

7 Steps to Guarantee a Life of Cyber Misery:

1. Make our systems and organisation as complex as we can!
2. Treat compliance as our ultimate ceiling!
3. Face an Adaptive Adversary with Static, Bureaucratic Speed!
4. Obliterate the line between Oversight and Execution!
5. Retain Data Forever Like a Digital Hoarder!
6. Treat Cyber as a Technology Problem!
7. Don't innovate or invest in internal R&D!

Framed this way the messaging becomes more attention seeking and urgent and hopefully the decision makers in organisations refocus on these critical issues.

JV: What do you recommend to the NZ Government as they race to improve the NZ ecosystem?

RK: New Zealand is seen as a first mover and leader in some areas, for example the Harmful Digital Communications Act 2015, but in other areas has been slower.

If New Zealand were to look to Australian experiences for lessons to learn, the steps taken in 2024 to appoint Lieutenant General Michelle McGuinness, CSC as Australia's National Cyber Security Coordinator, has made a substantial difference.

As the Coordinator, LTGEN McGuinness leads whole-of-government coordination of the delivery of the Strategy, the coordination of responses to significant cyber incidents, whole-of-government cyber incident preparedness efforts, and the strengthening of Commonwealth cyber security capability.

This clarification of the response structure could be copied by New Zealand to enable faster responses to both the people and the sources of strife. Again, New Zealand's simpler governing structure, needs to be seen as a source of agility.

JV: New Zealand does not yet have Critical Infrastructure legislation (the DPMC consultation process ran until April 2026). Are there particular learnings from the Australian legislative introduction process, that NZ industry and government could learn from?

RK: The Australian Privacy Act was put in place in 1988 (38 years ago) yet because it is Principles based and technology agnostic, it still works. The Security of Critical Infrastructure Act 2018 (SOCI Act) was not Principles based and has already seen amendments to reflect changes in threat vectors, changes in the understanding of what Critical Infrastructure is and changes in the fabric of technology.

DPMC New Zealand went out for consultation earlier this year, but legislation will likely be a job for the new Government. They would benefit from learning from Australian experiences and seek to use more principles and fewer locked in concepts which could rapidly age.

JV: ISO/IEC 27001:2022 is slowly growing in uptake in NZ. Are you seeing it used merely to help Australian organisations in box ticking or to genuinely support constantly increasing maturity?

RK: The fear of HSWA prosecution has seen an ISO rort across Australia and New Zealand with the production of useless, context lacking, off the shelf management systems.

A decision to follow ISO/IEC 27001:2018 absolutely does not need to lead to a similar experience, provided that each implementing organisation is razor sharp on its own context, needs and priorities. A systematic and methodical assessment of the system of security will always pay dividends.

However, if NZ companies can secure budget for a 27001 exercise, but not the necessary security culture and continuous improvement, my recommendation would be to spend on the culture.

JV: How are Australian organisations receiving the news that to be effective, penetration testing and shoring up defence systems needs to be constant and automated?

RK: While larger businesses in Australia tend to get the importance of constant and continuous testing, SMEs do not always grasp the importance of the commitment to testing continuity.

I often explain that in securing your house you can lock all the doors and walk around for a one-off security check or you can install



CCTV and a monitoring contract. One demonstrates safety for one moment, the other 24/7.

SMEs with no in-house security team should really be looking at a managed SOC or cloud security features to leverage off the infrastructure spend already driven by bigger technology businesses. This spend is increasingly the more cost-effective option.

JV: You had strong words to say about the folly of relying on internal auditors who report to the gatekeepers and budget holders. Are you seeing any changes in reporting lines to deflect the folly?

RK: The bottom line is that if the CISO does not report directly to the CEO (and not CIO or CFO) the spend on internal auditing may be a waste. For good corporate governance, you would never find an internal audit team reporting to the CFO.

If the world learned anything from Enron/Arthur Anderson and the failures that followed, it is that proper separation is important if the management genuinely wants the function and purpose of Internal Audit to matter.

JV: The CIO Innovation Summit devoted substantial time to the issue of data as a critical source of value and threat. What are your recommendations to NZ Government/Industry which may be distracted by AI hype, away from Cyber and data cleansing?

RK: Data hoarding is a major risk to every organisation. As seen in the 2023 Latitude Financial hack, data no longer needed but kept because more storage is cheaper than destruction, can come back and bite and bite hard. The current AI focus could be used as the impetus needed for a round of obsolete data destruction.

JV: You referenced the World Economic Forum's Global Cybersecurity Outlook 2026 and in particular Section 3.7 "Future Threat vectors are emerging in silence" and the issue of quantum cryptography risks. Are you seeing the right levels of concern in Australia and New Zealand around this emerging threat?

RK: In a word, no. I have a number of PHD students looking at organisational readiness for Q-Day (Q-Day being the day when quantum computing is widely available and ready to make current cryptography obsolete). This day, likely to be before 2030, will require advanced and substantial redesign of organisational structures and architecture.

If you remember Y2K as a damp squib do not expect the same of Q-Day.

Transnational, Serious and Organised Crime Chief Executive Board meets

Government's new Transnational, Serious and Organised Crime (TSOC) Chief Executive Board set to improve governance and coordination across agencies.

"We need better organised government to fight organised crime, and the Board will help deliver that," Associate Police Minister Casey Costello said.

"The Government has made a series of decisions to improve our response to TSOC, including appointing a Ministerial Advisory Group (MAG), and putting in place a new TSOC strategy and Action Plan. A key recommendation of the MAG was to improve governance and coordination across government and that is what the CEB will do."

Government agency Chief Executives who will be permanent members of the CEB include Ben King, Department of the Prime Minister and Cabinet; Peter Mersi, Inland Revenue; Paul James, Department of Internal Affairs; and Nic Blakeley, Ministry of Business, Innovation and Employment.

They join the joint chairs, Customs Comptroller Christine Stevenson and Police Commissioner Richard Chambers.

"We are at a critical time in the fight against TSOC," Ms Costello said. "New Zealand is being increasingly targeted by organised criminal groups – we are seeing this in the supply of drugs like meth and cocaine, in a wave of cannabis grow houses, and in the impacts of industrial-scale scam centres operating internationally.

"These crimes involve money laundering and migrant exploitation, and they impact all of us through related violence, money disappearing out of the economy and community and personal harm from drugs.

"I've said before, individual agencies do great work in trying to address this, but there are multiple agencies with different powers who have a role in fighting organised crime and across government we need a stronger and more cohesive response.

"What the CEB provides is enhanced oversight and coordination of this work and it will provide the mechanism for focusing on system issues such as information sharing.

"The public probably assumes that, for example, Customs and Police routinely share the phone numbers of gang members they are investigating, but that is not the case. In fact, in most circumstances it is not even permitted."

The CEB's priorities will be to:

- embed the TSOC Strategy and ensure delivery of the TSOC Action Plan
- drive activities that support system-wide information sharing, improve collective investigative practice, and facilitate strategic investment



Associate Police Minister Casey Costello.

- identify legislative opportunities to combat TSOC
- sustain and strengthen ROCC
- review existing governance and support structures including opportunities for increased effectiveness and efficiencies across agencies and the TSOC system.

"The Board's initial focus will be on driving the system response to organised crime and operational cohesion, particularly around money flows and the profitability of TSOC groups, and the CEB membership was determined on that basis," Ms Costello said.

Interview: Using AI to make firefighting smarter

Xiang Zhou talks to Nicholas Dynon on harnessing the power of artificial intelligence to provide firefighters with earlier warning of escalating fire conditions in buildings.

Ahead of September's FireNZ Conference & Tradeshow in Christchurch, I interviewed conference speaker Xiang Zhou on his topic "Transferable and Robust AI Modelling for Smart Firefighting Using Graph Neural Networks".

A PhD candidate in Fire Engineering at the University of Canterbury, Zhou's research is supported by the UC–CSC (China Scholarship Council) Joint Scholarship and a research grant from the Society of Fire Protection Engineers (SFPE).

ND: Your conference paper is titled "Transferable and Robust AI Modelling for Smart Firefighting Using Graph Neural Networks." What's it all about?

XZ: My research focuses on applying AI techniques to fire engineering rather than developing new AI algorithms.

Perhaps the easiest way to explain the problem is to imagine firefighters arriving at a large, unfamiliar building. Every second matters. They have to make critical decisions using only limited information.

Our research aims to develop an AI model that can rapidly predict how a fire is likely to develop using temperature data collected by firefighters as they move through a building.

The objective is to provide real-time decision support. In particular, we want to help firefighters understand whether conditions remain tenable for firefighting operations and, more importantly, predict the onset of one of the most dangerous stages of fire development: flashover.

Flashover is the point at which almost every combustible material within a room ignites almost simultaneously. When that happens, fire conditions escalate dramatically and the environment quickly becomes extremely hazardous. Our goal is to provide firefighters with earlier warning of that transition.

What makes our research different is that many existing AI models are designed for a single building or a single scenario. They generally require complete information from every compartment within a building before they can make reliable predictions.

If those models are applied to another building, they often need to be retrained from scratch. Instead, we're trying to teach the model knowledge that can transfer between different buildings and different fire scenarios. That means substantially less data, less computational effort and much faster deployment.

Ultimately, we hope that will make AI-based decision support practical for real operational firefighting. In simple terms, we're trying to make AI models more transferable and more robust when they're used in real emergencies.



Xiang Zhou is a PhD candidate in Fire Engineering at the University of Canterbury.

ND: So, existing AI models are generally specific to a particular building or task because they've been trained for those environments. You mentioned that your approach makes use of "common knowledge." What do you mean by that?

XZ: Imagine a fire starting in one room of a multi-compartment building. Initially the fire develops in that room. Hot gases rise and form a smoke layer beneath the ceiling.

Eventually the smoke reaches the doorway and begins flowing into adjacent spaces, such as corridors and neighbouring rooms. As time passes, smoke gradually fills those connected spaces.

That sequence is fundamentally the same regardless of the building.

It's a common pattern of fire development. Those physical processes represent the common knowledge we're trying to teach the model.

Rather than learning every building independently, the model learns these underlying fire behaviours and transfers that understanding to new environments. Doing so significantly reduces the amount of training data required.

ND: When you're training the model, what kinds of information are being considered? Are you considering room dimensions, building materials, time to combustion or similar variables?

XZ: Fire is an extremely complex phenomenon involving many interacting variables. The underlying datasets incorporate all of those factors, including building layout, compartment size and construction characteristics. However, rather than using every one of those variables directly, our model uses temperature measurements as the primary input.

Temperature effectively becomes a representative indicator that captures the influence of many underlying factors. The model analyses temperature histories from different compartments and uses those relationships to predict future fire development.

For example, one application is predicting future smoke layer temperatures within the fire compartment.

Another is predicting whether flashover is likely to occur. The same temperature information can also be used for other prediction tasks, such as estimating future heat release rates. Temperature therefore becomes the common input across multiple prediction tasks.

ND: From a practical firefighting perspective, how would a firefighting crew actually use this system? How would it assist them operationally?

XZ: Existing AI models generally require information from every compartment within a building before they can generate predictions.

Our approach is different. The model uses temperature data collected progressively by firefighters as they advance through the building during search, rescue and firefighting operations.

As firefighters move through the structure, they deploy temperature sensors. The information collected from those sensors is continuously fed into the model. As additional temperature data becomes available, the model updates its predictions and provides decision support in real time.

The objective is to help firefighters understand whether conditions remain tenable for both occupants and emergency responders.

At present, firefighters often rely heavily on qualitative observations and experience when assessing fire development.

Our research aims to complement that experience by providing quantitative predictions that can support operational decision-making. As more sensor information is collected, the predictions become increasingly accurate. That's the operational scenario we're ultimately working towards.

ND: What types of sensors are you envisaging? Are we talking only about temperature sensors, or would firefighters also use technologies such as visual imaging, LiDAR or chemical sensors?

XZ: At this stage our model only requires temperature information. That can be obtained using thermal sensors, thermal cables or temperature detectors.

In future research we'd certainly like to incorporate additional sensing technologies so the model can develop a more comprehensive understanding of the fire environment. For now, however, temperature alone provides the information we need.

ND: So, the model is making predictions based primarily on fire behaviour represented through temperature, as opposed to detailed structural information relating to the building itself?

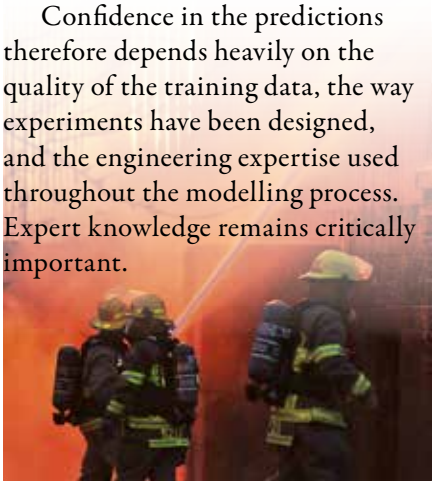
XZ: The AI model is fundamentally data-driven. The datasets used during training already contain information about building layouts, lining materials, compartment sizes and many other relevant variables.

Rather than requiring those variables individually during deployment, the model learns the relationships between them during training. Temperature becomes the key observable input. The neural network learns how temperature relates to those underlying building characteristics and to fire development.

One of the strengths of artificial intelligence is its ability to capture highly complex relationships using relatively simple input and output variables.

At the same time, this creates one of AI's biggest challenges. People often describe neural networks as a "black box" because it isn't always obvious how the model reaches a particular conclusion.

Confidence in the predictions therefore depends heavily on the quality of the training data, the way experiments have been designed, and the engineering expertise used throughout the modelling process. Expert knowledge remains critically important.



Pacific Logistics: Why New Zealand Needs Sovereign Shipping

With the withdrawal of the MV Moana Chief, New Zealand has lost a critical container shipping capability, writes Graeme Doull.



Graeme Doull is a logistics management specialist. He was previously a New Zealand Army Armoured Corps officer and saw operational deployment to Bougainville and with INTERFET to East Timor.

In the Pacific theatre, logistics means ships. For New Zealand and our Pacific neighbours, 99 percent of import volume arrives by sea, and maritime links shoulder a significant proportion of the domestic freight task.

While air freight remains a highly visible capability, it lacks the raw tonnage capacity required for sustained operations. Aircraft deliver speed rather than mass. They are valuable for moving personnel, medical supplies and high-value cargo, but cannot sustain the volume of freight required for prolonged military operations or national recovery.

Delivering resilient logistics – whether supporting military operations or disaster recovery – requires vessels capable of carrying standard ISO containers without depending on sophisticated port infrastructure. They must be able to load and unload cargo independently, operate in shallow or damaged ports, transfer freight to landing craft, and conduct Roll-On/Roll-Off (Ro-Ro) operations where infrastructure is limited.

The Erosion of Sovereign Commercial Fleets

Historically, military planners could rely on the Merchant Navy – commercial ships flagged to a nation that could be requisitioned or directed into service during a crisis. Today, that contingency has largely disappeared.

The global commercial fleet has traded flexibility for scale. International container ships are increasingly larger, deeper drafted, and ungeared (lacking shipboard cranes), making them wholly dependent on sophisticated port infrastructure.

The global fleet of smaller geared container ships – around 1,000 – 1,500 TEU (twenty-foot equivalent units) capable of loading and unloading themselves – is in increasingly short supply. This class of vessel represents a good balance of capacity, flexibility and accessibility for Pacific operations.

Foreign-flagged vessels carry no intrinsic loyalty to New Zealand. In a high-risk operational environment or a regional crisis, commercial operators will bypass ports to mitigate risk to their assets or avoid delays to their schedules.

The Moana Chief and the Cost of Inaction

We are now witnessing the effective end of New Zealand's dedicated domestic container shipping capability. The July 2026 withdrawal of the Moana Chief, a 1,700 TEU coastal freighter, marks the loss of New Zealand's last locally flagged coastal container freight service. Although the vessel's own cranes were removed in 2019, leaving it dependent on port infrastructure, it nevertheless provided an important domestic container capability. With



MV Moana Chief sails off into the sunset. Image: Ship Spotters New Zealand / Facebook.

its withdrawal, that capability disappears entirely.

While the New Zealand-flagged Rangitata remains in operation, it is primarily a bulk carrier transporting fertiliser and cement, with a limited container capacity of 90 TEU.

To put that into perspective, South Island supermarkets consume in the order of magnitude of 1,300 TEU of packaged goods every week. That includes imported and locally manufactured grocery products – from food through to beer and wine – but excludes fuel, construction materials, engineering equipment, emergency relief supplies and the additional freight required to restore damaged infrastructure following a major disaster.

The loss of this capability matters. Consider the domestic implications of the AF8 scenario – an Alpine Fault magnitude 8 earthquake, which is an 'almost certain' natural disaster (a 75 per cent probability of occurring within the next 50 years). When it eventually occurs and the South Island road and rail networks are catastrophically damaged, coastal shipping will be the only viable method for moving freight.

International shipping lines will not risk their vessels to service damaged, aftershock-prone ports; if they cannot guarantee a rapid turnaround, they will simply omit the South Island entirely.

Time for a Resilient Shipping Strategy

If New Zealand intends to sustain a deployable military capable of operating across the Pacific – and if we are serious about domestic disaster resilience – we require sovereign shipping solutions. A minimum sovereign fleet of three to four vessels would provide meaningful redundancy, ensuring that capability can be maintained while meeting training requirements, routine maintenance and operational deployment.

This could be delivered via two potential paths:

- Naval Amphibious Capability: The RNZN could commit to purpose-built sealift support vessels, moving beyond the single-point-of-failure represented by the highly useful, but aging, HMNZS Canterbury, or
- A Sovereign Commercial Fleet: A government-supported, New Zealand-flagged commercial fleet designed to provide guaranteed operational options during a national or regional crisis. This is not a novel concept; Australia has recognised this vulnerability through the establishment of its Maritime Strategic Fleet.

Whichever path is chosen, these vessels must be flexible enough to operate in austere ports using organic Ro-Ro ramps and heavy-lift cranes. These ships should not sit idle awaiting crises. Operating continuously in service across New Zealand and the Pacific would strengthen regional relationships, generate economic value, and ensure crews maintain operational proficiency in freight operations.

Geography dictates our strategic reality. Distance is our primary defence, but also our greatest vulnerability. When the next crisis hits – whether a regional conflict or a catastrophic natural disaster – New Zealand must possess the organic capacity to sustain itself. If we do not own the ships, we do not own a solution.

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"PCI is an important element in the ASIS Certification programme, dovetailing into both CPP and PSP for a comprehensive understanding of broader security industry objectives. An effective and reliable investigation depends on objectivity, thoroughness, relevance, accuracy and timeliness. PCI helps identify critical investigative outcomes, including evidence collection, case management, and the process of offender detection, identification, interview and prosecution. Good physical security designs, together with robust policies and procedures are key elements in a successful investigation. The PCI certification provides an insight into how these pieces interrelate."

- David Horsburgh, MSc CPP PSP PCI

WHY EARN THE PCI DESIGNATION?

- Provides independent confirmation of your specialized skills in security investigations
- Gain global recognition by your peers and industry
- Get a competitive edge in the marketplace
- Enhance your career and earnings potential
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WHY SHOULD AN EMPLOYER HIRE ASIS CERTIFIED PROFESSIONALS?

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- Promote ongoing education of critical job knowledge and skills
- Feel confident that your staff are using best practices
- Recruit the most qualified professionals
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