

AUKUS: New Opportunities for the United States and Its Closest Allies

Peter Jennings

On September 15, 2021, U.S. President Joe Biden, Australian Prime Minister Scott Morrison, and U.K. Prime Minister Boris Johnson held a virtual media conference to announce “the creation of an enhanced trilateral security partnership called ‘AUKUS’—Australia, the United Kingdom, and the United States.” The partnership focuses on the Indo-Pacific and is intended to “foster deeper integration of security and defense-related science, technology, industrial bases, and supply chains.”¹

The most striking initial AUKUS project is “a shared ambition to support Australia in acquiring nuclear-powered submarines” and a projected 18-month time frame “to seek an optimal pathway to deliver this capability.” Only once before has the United States given a foreign power access to technology to develop nuclear propulsion: the United Kingdom in the 1950s. AUKUS therefore represents a significant strategic opportunity for Australia. More broadly, the partnership offers to pool defense-related science and technology and each country’s defense industry into a shared endeavor, working on the following high-priority areas: “cyber capabilities, artificial intelligence, quantum technologies, and additional undersea capabilities.”²

Early reactions to AUKUS described the agreement as a big deal. *The Economist* declared AUKUS to be as profound a strategic shift as “Nixon going to China in 1972 and the fall of the Berlin Wall in 1989.”³ It was a new piece of strategic architecture in the Indo-Pacific and for that reason directly aimed at the People’s Republic of China (PRC) and Beijing’s challenge to the rules-based order. Biden underlined this point at the agreement’s launch: [T]he future of each of our nations—and indeed the world—depends

on a free and open Indo-Pacific enduring and flourishing in the decades ahead.”⁴

While the Australian Navy appeared to be the first beneficiary of AUKUS’s focus on nuclear propulsion, the reality is that even on the most optimistic projections, a nuclear-powered submarine for Australia is at least a decade—and perhaps more realistically 15 to 20 years—in the future. In this essay, I will assess the opportunities and risks associated with AUKUS, asking what each of the three partners may want to get for their political and economic investment. All three countries stand to gain from AUKUS in geopolitical, strategic, and defense terms, but not without some risk to the practical delivery of defense technology outcomes.

AUKUS: The Strategic Context

AUKUS reflects a shared understanding among the three partner countries that the PRC presents an immediate and sustained challenge to the international security order, not only globally, but most pressing in the Indo-Pacific region. Each country has been forced to change policy on the PRC over the past decade, moving from attempts to engage Beijing with a view to shaping its behavior to a point now where the three countries openly acknowledge the danger of an assertive China’s growing power.

This has not been an easy process. Australia concluded a free trade agreement with China in late 2014 on terms that would hardly be acceptable today, and Tony Abbott, then the center-right Australian Prime Minister, welcomed Xi Jinping to Canberra saying that “a relationship might begin with commerce but it rarely ends there once trust has been established, as I believe it has between Australia

and China.”⁵ In 2015, then-British Prime Minister David Cameron was welcoming a “golden era” with Beijing based on massive PRC investment in critical infrastructure.⁶ When Xi visited Washington, D.C., in September 2015, he gave assurances to President Barack Obama that China had “no intention to militarize” the disputed Spratly Islands in the South China Sea and would reduce the cyber-enabled theft of American intellectual property.⁷ For a short while, there was hope in the White House that Xi could be taken at his word.

Since those optimistic times, policy toward the PRC has hardened in the AUKUS capitals. The need to respond to Beijing’s militarization of the South China Sea, massive military spending, coercive use of trade and investment, cyber espionage, and attempts to undermine American and allied influence in the Indo-Pacific has forced governments to make more negative assessments about Beijing’s intentions. The arrival of AUKUS reflects a shared realization that more concerted effort is needed to align policy responses to China and fast-track emerging military capabilities to strengthen deterrence. AUKUS should therefore be seen in the context of the arrival of the QUAD (a grouping that includes the U.S., Australia, Japan, and India); the rapidly growing Australia–U.S.–Japan trilateral defense partnership; and an enlarged and revitalized NATO. These are all recent examples of the world’s consequential pluralist countries grouping together in the face of a sustained authoritarian challenge from the PRC and Russia.

AUKUS does not supplant existing bilateral treaty agreements and defense cooperation activities between the U.S. and Australia and the U.S. and Britain, but it brings a new trilateral mechanism to the fore, creating the possibility of wider cooperation among the three countries’ defense and intelligence establishments, research and development, and industrial sectors.

AUKUS is perhaps also a tacit acknowledgement of the limits to the individual capacities of the three countries. As powerful as the United States is, it needs capable allies to bolster American military strength, add options for logistic support and sustainment, and field interoperable military platforms. For all three countries, AUKUS is a potentially valuable force multiplier with the capacity to strengthen conventional deterrence and complicate Beijing’s strategic planning.

How Does AUKUS Fit with U.S. Strategy?

Successive American Administrations have sought to give more priority to the Indo-Pacific, and Biden’s February 2022 *Indo-Pacific Strategy* stresses an “intensifying American focus” on the region. Two themes dominate the Biden strategy:

- This is a competition for influence with China, which “seeks to become the world’s most influential power” through “coercion and aggression,” and
- The United States will counter this through “collective efforts over the next decade” with allies and partners.⁸

On America’s defense posture in the region, the Biden strategy refers to AUKUS in the context of reinforcing and strengthening deterrence and bringing together European and Indo-Pacific partners. The AUKUS technology agenda fits neatly into the strategy’s priority list for Indo-Pacific defense priorities:

We will foster security ties between our allies and partners in the Indo-Pacific region and beyond, including by finding new opportunities to link our defense industrial bases, integrating our defense supply chains, and co-producing key technologies that will shore up our collective military advantages. As we do, we will bring together our Indo-Pacific and European partners in novel ways, including through the AUKUS partnership.⁹

There is substantial continuity between the Trump and Biden Administrations in terms of American force posture in the Indo-Pacific. The National Security Strategy released by then-Secretary of Defense James Mattis in 2018 defines key desired attributes of U.S. forces in the Indo-Pacific:

Forward force maneuver and posture resilience. Investments will prioritize ground, air, sea, and space forces that can deploy, survive, operate, maneuver, and regenerate in all domains while under attack. Transitioning from large, centralized, unhardened infrastructure to smaller, dispersed, resilient, adaptive basing that include active and passive defenses will also be prioritized.¹⁰

This is particularly relevant to U.S. thinking about Australia's strategic geography and the potential for American forces to operate with their Australian Defence Force (ADF) counterparts in and from the north of Australia. Since 2010, the U.S. Marine Corps has been staging annual six-month to eight-month rotational deployments to Darwin in the Northern Territory. The U.S. Air Force has been staging increasing numbers of flights from Australia's northern air bases. Current planning seeks to intensify this cooperation. At the most recent annual Australia–U.S. Ministerial Consultations (AUSMIN) talks in September 2021, bringing the U.S. Secretaries of State and Defense together with their Australian counterparts, the Secretaries and Ministers endorsed the following areas of force posture cooperation:

- Enhanced air cooperation through the rotational deployment of U.S. aircraft of all types in Australia and appropriate aircraft training and exercises.
- Enhanced maritime cooperation by increasing logistics and sustainment capabilities of U.S. surface and subsurface vessels in Australia.
- Enhanced land cooperation by conducting more complex and more integrated exercises and greater combined engagement with Allies and Partners in the region.
- Establish a combined logistics, sustainment, and maintenance enterprise to support high-end warfighting and combined military operations in the region.¹¹

Without much attention being drawn to it, the U.S. is investing substantially in building a fuel facility near Darwin, to be completed in September 2023, which will be able to store 300 million litres (nearly 80 million U.S. gallons) of military jet fuel.¹²

Taken together with the arrival of AUKUS, it seems clear that American thinking about Australia's strategic value in the Indo-Pacific is changing. Northern Australia is becoming more important to support a dispersal strategy, while Australia's potential as a supply and sustainment hub is growing. An Australian Defence Force operating nuclear-powered submarines (in all probability *Virginia*-class

SSNs) along with an array of interoperable platforms, sensors, and weapons is valuable. Combine that with key elements of equipment production and prepositioning in Australia along with access to ADF bases and national infrastructure, and this becomes a powerful force multiplier for the U.S. military at great distance from the continental U.S.

Are there risks to the United States in pursuing a closer defense relationship with Australia? All alliances impact autonomous decision-making to some degree. However, nothing can replace the value of Australia's strategic geography to the south of the Asian mainland. Just as in the Second World War, a major military campaign focused on the Western Pacific would find Australia a vital piece of geography for the United States. The U.S. must factor in occasional political differences between Canberra and Washington that may impact the conduct of operations. For example, how would the two countries manage political decision-making in support of military operations mounted from Australian territory? Nevertheless, over the 70-year life of the ANZUS treaty,¹³ Australia and the United States have had a remarkable confluence of shared strategic interests, and this confluence is only being reinforced by the rise of an assertive Beijing.

The British Agenda for AUKUS

In March 2021, the U.K. government released a policy statement, *Global Britain in a Competitive Age: The Integrated Review of Security, Defence, Development and Foreign Policy*. The statement argued that “the Indo-Pacific will be of increasing geopolitical and economic importance, with multiple regional powers with significant weight and influence, both alone and together.”¹⁴ As a result, Britain would “tilt to the Indo-Pacific,”¹⁵ in part as a response to the competitive challenges presented by China. The policy shift was underscored by a deployment to the Indo-Pacific of the *Queen Elizabeth* aircraft carrier and a maritime strike group in late 2021.

Not all in the U.K. are convinced that the “tilt” will survive after the Prime Ministership of Boris Johnson, the chief architect of the policy. The judgment of Peter Ricketts, now in the House of Lords after a career at the heart of British foreign policy, is unambiguous: “A tilt to the Indo-Pacific is a slogan not a strategy. It does not match closely enough the pattern of Britain's vital interests to become the basis for a durable national strategy.”¹⁶ Ricketts does

accept, though, that an active foreign policy in Europe and deeper engagement in the Asia–Pacific “are not mutually exclusive.”¹⁷

Russia’s invasion of Ukraine is a reminder that Europe and the U.K. face more immediate strategic threats in their own neighborhood. This, appropriately, will be a primary driver of British defense policy. However, enabled by the size of its economy and population and driven by a nationalist and assertive ideology, the PRC will remain the biggest long-term strategic challenge to global stability. Whether acknowledged or not, all countries are tilting to the Indo-Pacific. After Brexit, the U.K. is looking for markets and economic prospects in the region. This mix of risk and reward is likely to sustain a long-term British interest in the Indo-Pacific, perhaps best regarded as a second-level security priority after the existential threat presented to Europe by a revanchist Russia.

AUKUS is a prime enabler for the U.K. to pursue its agenda for an Indo-Pacific tilt. The two policy objectives of enhanced trilateral cooperation and a stronger British presence and interest in the Indo-Pacific align comfortably. In a perfect policy world, AUKUS should add momentum to independent British efforts to pursue a tilt to the region. From a British perspective, AUKUS cements a stronger bilateral relationship with the U.S. that is quite separate from NATO or other European connections. If the aspired level of technology cooperation is achieved, AUKUS lifts the U.K. and Australia into a closer and stronger relationship with the United States relative to any other ally or partner. Britain will probably also assess that a close AUKUS industrial partnership will strengthen its defense export position relative to European competitors.

AUKUS and Australia

The arrival of AUKUS reflects a strong Australian interest to seek support from like-minded democracies in what has been a protracted and complicated set of disputes with China. In 2018, Australia became one of the first countries to exclude PRC companies, in particular Huawei and ZTE, from participating in the rollout of the 5G network. Canberra has also passed laws banning PRC funding of political parties, prevented at least some Chinese acquisitions of critical infrastructure, and modernized anti-espionage and anti-covert interference laws. Following then-Prime Minister Scott Morrison’s call for an international investigation into the origin of the Covid-19

virus, Beijing retaliated with official and unofficial bans on Australian exports including coal, barley, wine, beef, seafood, and other commodities.

From a defense perspective, Australia has been particularly concerned about the PRC’s illegal annexation of much of the South China Sea and its cultivation of political influence with Australian state governments, with Pacific Island countries, and in Southeast Asia. A *Defence Strategic Update* issued in 2020 concluded that:

Previous Defence planning has assumed a ten-year **strategic warning time** for a major conventional attack against Australia. This is no longer an appropriate basis for defence planning. Coercion, competition and grey-zone activities directly or indirectly targeting Australian interests are occurring now.... Reduced warning times mean defence plans can no longer assume Australia will have time to gradually adjust military capability and preparedness in response to emerging challenges. This includes the supply of specialised munitions and logistic requirements, such as fuel, critical to military capability.¹⁸

In responding to these developments, Canberra has sought to deepen alliance cooperation with the United States significantly, build closer defense ties with Japan and India, and restate the importance of cooperation between countries that support the international rule of law.

There is bipartisan political and domestic popular support for lifting defense spending beyond the current level of 2.1 per cent of gross domestic product, as well as for establishing the conditions for domestic production of a range of missiles for ADF and allied use, expanding offensive and defense cyber capabilities, and looking for other ways to increase ADF range and firepower to boost deterrence. Australian governments have recognized that emphasizing force structure improvements—replacing aging submarines and surface vessels, for example—that would not deliver new capabilities until well into the 2030s was a major weakness in defense planning.

AUKUS therefore addresses five identified Australian strategic needs.

- It seeks to engage the United States more closely, giving Washington reason to put higher value on its alliance with Australia.

- British involvement is welcomed by Canberra as a way of signaling that likeminded democracies will work together to resist the PRC's challenge to the global order. This is a way of internationalizing what has been a difficult bilateral struggle between Canberra and Beijing.
- AUKUS offers the possibility of fast-tracking the acquisition of new military technology that will strengthen deterrence and give the ADF a technology edge.
- AUKUS underpins a strategic judgment that the defense of Australia is something that can be credibly assured only within an alliance context, so the ADF needs to have the best possible levels of interoperability with the U.S. military.
- AUKUS addresses a central policy failure spanning several Australian administrations, which is the inability to find more capable replacements for the ADF's high-quality but aging *Collins*-class submarines.

Australian critics of AUKUS argue that the agreement draws the country too closely into the U.S. rivalry with China. Hugh White, for example, argues that “we cannot take it for granted the US will solve our China problem for us. On the contrary, our ally will probably fail us. Americans will find that it will cost them more than it is worth to maintain leadership in Asia against China’s formidable challenge.”¹⁹

White’s critique is based on his concluded view that China will not be deterred from seeking dominance in the Indo-Pacific. Australian national security policymakers do not accept that position, preferring instead to argue that a close alliance with the United States helps to strengthen deterrence. It is certainly true, though, that an alliance made closer through AUKUS will lift American expectations about what Australia should be able to contribute to that collective defense effort.

The Submarine Strategy

Prior to the AUKUS announcement, Australia was planning to replace its six *Collins*-class conventional attack submarines with 12 locally built French-designed submarines designated the *Attack*-class. The aim as stated in the *2016 Defence White Paper* was to produce 12 “regionally superior

submarines with a high degree of interoperability with the United States.” The “key capabilities” of these submarines “will include: anti-submarine warfare; anti-surface warfare; intelligence, surveillance and reconnaissance; and support to special operations.”²⁰ By 2020, Prime Minister Scott Morrison had formed doubts about whether the *Attack* class would provide that regionally superior capability at the time of initial delivery around the mid-2030s.

Morrison directed a small team in the Defence Department to identify alternative submarine designs. By the time of the G-7 meeting in Cornwall in the United Kingdom, Biden, Johnson, and Morrison had agreed privately on the broad shape of AUKUS cooperation, noting that “the strategic context in the Indo-Pacific was changing and that there was a strong rationale for deepening strategic cooperation between the three governments.”²¹ It was a remarkable step made possible only by the presidential decision to allow Australia access to nuclear technology.

In my personal experience as Deputy Secretary for Strategy in the Defence Department between 2009 and 2012, the United States Navy and wider national security system was not in any way disposed to give Australia access to submarine nuclear propulsion technology. Australian officials had raised the issue on several occasions only to be politely but firmly rebuffed. The U.S. Navy’s interest was in assisting Australia to strengthen its capacity for conventional attack submarine operations.

Media reports suggest that there are substantial reservations in the U.S. Navy about the AUKUS plan to develop an Australian SSN. For example, Randy Schriver, a former Assistant Secretary of Defense in the Trump Administration, identified “many potential obstacles on both sides” including from the U.S. Navy. Schriver told *The Australian* newspaper that there needed to be “sustained commitment from the senior political leaders in both capitals, otherwise the chances of Australia deploying its own nuclear submarine will drop below 50 per cent.”²² In effect, the decision to proceed with finding a pathway for Australia to access SSNs could have come only from President Biden. From an Australian perspective, an essential part of the 18-month “pathway” to March 2023 is to assure the U.S. Navy, Department of Energy, and other parties that Australia is capable of handling this transfer of intellectual property and technology securely and safely.

An Australian Nuclear Powered Submarine Task Force was established to work with the U.K. and U.S. on defining an 18-month pathway to development of an acquisition strategy. Key issues that the pathway is intended to address are “[s]ubmarine design, construction, safety, operation, maintenance, disposal, regulation, training, environmental protection, installations and infrastructure, industrial base capacity, workforce, and force structure.”²³

Compared to normal Defence business processes, this work is happening at breakneck speed, and measurable progress is being made. By December of 2021, a key parliamentary committee agreed to a U.S.–U.K.–Australia treaty enabling the exchange of naval nuclear propulsion information, an essential platform for classified information sharing. The committee noted that “the Australian Government has approved funding of up to \$300 million for the operation of the Nuclear Powered Submarine Task Force. As of 25 November 2021, the task force had 134 staff.”²⁴ By May 2022, that staff had grown to 226 people—by Australian standards a significant policy commitment.²⁵

In the United States, a bipartisan congressional working group announced in June 2022 that the Australia–U.S. Submarine Officer Pipeline Act was being introduced to “establish a joint training pipeline between the U.S. Navy and the Royal Australian Navy” and “enable the start of U.S.-based training of Commanding Officers for Australia’s future fleet of nuclear-powered submarines under the AUKUS alliance.”²⁶

Given the rapid worsening of the strategic outlook in the Indo-Pacific, much attention has been paid to how quickly a nuclear propulsion capability could be delivered to Australia. A complicating factor is that the Morrison government insisted that the nuclear submarines could be built in Adelaide, South Australia. To put it mildly, this is a major commitment, well ahead of current Australian industrial capability. The head of the Nuclear Powered Submarine Task Force, Vice Admiral Jonathan Mead, has said that outside of weapons fit, no design changes would be made to a choice between either the British *Astute*-class or American *Virginia*-class SSNs. Mead has acknowledged that, given design priorities in the U.K. and U.S., “new versions, the American SSNX and the British SSNR, will be in the mix.”²⁷

In January 2022, U.K. Foreign Secretary Elizabeth Truss commented to the Australian media that

there could be the possibility of “collaborative development by the three AUKUS parties rather than a choice of Britain’s *Astute*-class or America’s *Virginia*-class.”²⁸ There is promise in that approach, which could produce a design common to all three navies along lines like the common development approach used for the Joint Strike Fighter.

There is intense speculation in Australia that it might be possible to lease or acquire a U.S. *Virginia*-class SSN in U.S. service, reflagging the boat as Australian before 2030 and before construction of Australian SSNs. Peter Dutton, Australia’s Minister for Defence up to the May 2021 election and now leader of the centre-right Opposition, claims that:

I believed it possible to negotiate with the Americans to acquire, say, the first two submarines off the production line out of Connecticut. This wouldn’t mean waiting until 2038 for the first submarine to be built here in Australia. We would have our first two subs this decade. I had formed a judgment that the Americans would have facilitated exactly that.²⁹

For that to happen, Biden or his successor would have to conclude that there was value in giving Australia access to these boats ahead of the U.S. Navy’s own demands for more submarines. The advantage to the U.S. is that Australia would pay for the capability, allowing an expansion of a larger “federated” submarine presence in the Indo-Pacific. However, no one should underestimate the costs and challenges ahead in realising this Australian capability in every area from construction and sustainment to basing, crew training, safety, and operational planning.

The Wider AUKUS Technology Agenda

In addition to nuclear propulsion, the September 2021 AUKUS announcement identified four “high priority areas” for collaborating work: cyber capabilities, artificial intelligence, quantum technologies, and additional undersea capabilities. Further, in April 2022, Biden, Johnson, and Morrison met virtually to review progress on the AUKUS agenda and added some new categories for increased collaboration: “We also committed today to commence new trilateral cooperation on hypersonics and counter-hypersonics, and electronic warfare capabilities, as well as to expand information sharing and to deepen cooperation on defense innovation.”³⁰

Little has been publicly released about progress to date. A tripartite senior officials' group has been appointed to oversee progress. In Australia, the Secretary of the Department of Prime Minister and Cabinet is the representative, while U.K. and U.S. National Security Advisers Stephen Lovegrove and Jake Sullivan, respectively, lead for their countries.

Two joint steering groups have been established: one focused on submarines and the other covering all other nominated areas of advanced technology. Working groups have been established for each technology. To date, a work plan has not been released.

On April 5, 2022, the partners released a fact sheet reporting the following meetings:

- “On March 10, 2022, National Security Advisors from the three allies met virtually to review AUKUS progress and provide direction to the trilateral partnership going forward.”³¹
- “The three countries have held multiple Joint Steering Group meetings for each of the two AUKUS lines of effort, including in-person meetings in Canberra, London, and Washington, D.C.”³²
- “Seventeen trilateral working groups have been established (nine relating to nuclear-powered submarines, and eight to other advanced military capabilities); each has met multiple times.”³³

On April 1, 2022, it was announced that a bipartisan AUKUS Working Group, also known as the “AUKUS Caucus,” had been formed in the U.S. Congress. Its members, drawn from both the Democratic and Republican parties, are intent on “provid[ing] a forum for congressional attention on the implementation of AUKUS and on completing the steps needed to strengthen our already-existing security relationship.”³⁴

Three areas of weapons development activity that have been publicly revealed may be taken as examples of what could emerge from AUKUS cooperation.

First, in April 2022, the AUKUS leaders reviewed progress on implementation and, on autonomous systems, said: “Through the AUKUS Undersea Robotics Autonomous Systems (AURAS) project, our nations are collaborating on autonomous underwater vehicles, which will be a significant force

multiplier for our maritime forces. Trials and experimentation of this capability are planned for 2023.”³⁵ In May 2022, during the election campaign, then-Defence Minister Peter Dutton announced plans to fast-track the acquisition of three Extra Large Autonomous Undersea Vehicles (XLAUV).³⁶ For a planned cost of USD\$100 million, the boats are to be built in Australia over three years in a co-development project between the Australian Defence Organisation and U.S. company Anduril.³⁷ The boats are said to be capable of long endurance and multi-mission roles.

Second, a large investment in cyber capability was announced in the March 2022 Australian budget. Project REDSPICE—an acronym standing for Resilience, Effects, Defence, Space, Intelligence, Cyber and Enablers—will invest an additional AUS\$9.9 billion over the coming decade in a range of areas, including tripling the size of the Australian Signals Directorate’s offensive cyber capability. In terms of cooperation with the U.S. and U.K., ASD claims that Project REDSPICE will enable “[g]reater integration through expanded global footprint,” “[c]o-investment in Five-Eyes initiatives,” and “[c]ollaboration on AI and cyber technologies.”³⁸

Finally, without providing details, the Australian government has alluded to “collaboration with the United States to develop hypersonic missiles” as part of wider plans to develop a local missile manufacturing capability and increase stock holdings of U.S. missiles, including Tomahawk cruise missiles; joint air-to-surface standoff missiles (extended range); long-range anti-ship missiles (extended range); and precision-strike guided missiles for land forces with a range of over 400 kilometres.³⁹ In April 2022, the government announced that “Raytheon and Lockheed Martin have been chosen to deliver the Sovereign Guided Weapons and Explosive Ordnance Enterprise (GWEO), to initially enhance self-reliance and supply chain resilience, but with a future goal of developing a guided weapons manufacturing capability in Australia.”⁴⁰ It is clear that the project is intended to support U.S. missile requirements in the Indo-Pacific as much as it is to expand the ADF’s missile capabilities.

Reactions to AUKUS

International reactions to AUKUS were varied and largely divided on lines reflecting the strategic competition for influence in the Indo-Pacific.

Countries that welcomed the agreement included Japan, Singapore, and the Philippines. While Vietnam remained silent on the subject, it is assumed that it tacitly approves. France was critical based on the difficult reality that AUKUS ended its contract to design and build conventionally powered submarines in Australia.⁴¹ The change of government in Australia has opened the way to resuming a more positive bilateral relationship between Canberra and Paris.

Predictably, the PRC was a strident critic. A Ministry of Foreign Affairs spokesperson condemned the agreement, claiming that:

Cooperation on nuclear-powered submarine technology between the US, the UK and Australia will gravely undermine regional peace and stability, aggravate arms race and impair international nuclear non-proliferation efforts. It runs counter to regional countries' wishes. The three countries should discard the Cold War zero-sum mentality and narrow geopolitical perspective, follow the trend of the times for peace and development, and stop forming exclusive blocs or cliques.⁴²

Concerns about a supposed proliferation risk were aired by Indonesia and Malaysia. In May, Prime Minister Ismail Sabri of Malaysia told Japan's *Nikkei* newspaper that "We are worried that some other major economies will take advantage of AUKUS. For example, if China wants to help North Korea purchase nuclear-powered submarines, we can't say no because AUKUS has set a precedent."⁴³ Australia continues to make the case in Southeast Asia that it has no intention of acquiring nuclear weapons. All three AUKUS partners maintain that the agreement to provide Australia with a pathway to nuclear propulsion does not compromise their support for nuclear non-proliferation. The AUKUS countries advised the International Atomic Energy Agency (IAEA) that a critical objective of their cooperation will be to maintain "the strength of both the nuclear non-proliferation regime and Australia's exemplary non-proliferation credentials."⁴⁴

One important task for the AUKUS partners will be to determine whether any other countries should be allowed to participate in the broader technology development programs being advanced by the agreement. In an interview with the Australian Strategic

Policy Institute (ASPI) in November 2021, Japan's ambassador to Australia said, "We have been told there are some instances or areas where AUKUS members may need Japanese cooperation and participation and we are more than willing to do our contribution."⁴⁵

With two AUKUS members in NATO, it is relevant that the recently released NATO Strategic Concept commits the alliance to "promote innovation and increase our investments in emerging and disruptive technologies to retain our interoperability and military edge."⁴⁶ This too could create a basis for expanding AUKUS cooperation, although hopefully without a loss of focus and pace, which are key aspects of the AUKUS strategy.

Next Steps

A defining event in AUKUS's short history will be in March 2023 when officials are projected to bring to the President and the two Prime Ministers the plan for how Australia can acquire nuclear-propelled submarines. Australia's new Defence Minister and Deputy Prime Minister, Richard Marles, has said that he hopes to achieve three key outcomes at that time. The first is an identified submarine type, which amounts to a choice between the U.S. *Virginia*-class or British *Astute*-class SSNs or their design successors. Second, it is expected that the advice in March 2023 will identify a realistic time frame for the Australian submarine acquisition. Finally, Marles has said that he wants to understand options for an interim conventional submarine replacement if there is a gap between the end of life of the *Collins*-class submarines and the arrival of the SSNs.⁴⁷ The Australian Defence Organisation is working on the third of these options in parallel with the AUKUS study.

At this stage, there is little on the public record indicating timelines for developments in the other technology areas. A potential critical waypoint will be the AUSMIN Ministerial meeting, which is due to be held in Australia toward the end of 2022. Given the priority that recent AUSMIN meetings have put on strengthening interoperability between the ADF and U.S. forces and on shared technology development, we should expect that the United States and Australian governments will put a high priority on the AUKUS agenda's leading to the quickest possible deployment of new military capabilities.

What Could Go Wrong?

For all its promise, a lot could happen to derail AUKUS. The agreement is too disruptive of existing policy processes to have come from officials, and AUKUS would not have proceeded without the personal commitment of President Biden, Boris Johnson, and Scott Morrison. On May 21, 2022, Morrison's government was defeated in Australia's federal election. The new centre-left Labor government of Anthony Albanese has pledged to continue with AUKUS, although there are elements of the Labor Party that oppose nuclear propulsion. Labor depends on support from minor parties in the Senate, which in some cases are adamantly opposed to AUKUS and the alliance with the United States.

Whatever the views inside the Labor Party, AUKUS was popularly received by Australians. A poll conducted in March 2022 found that 52 percent of those surveyed thought AUKUS would make Australia safer, while 70 percent surveyed were in favor of acquiring nuclear propelled submarines.⁴⁸

As for Boris Johnson, in addition to having become deeply unpopular with British voters, he narrowly survived a vote of no confidence in his leadership from Conservative Party members of Parliament in early June and was finally forced to resign on July 7.⁴⁹ The Conservative Party is going through lengthy mandated processes to select a new party leader and therefore Prime Minister by October 2022. It would be surprising if a new Conservative Prime Minister opposed AUKUS, but beset with domestic and international problems, a new British PM might not give AUKUS the priority that Boris Johnson did. The British Labour Party maintains support for the U.K.'s own submarine-based nuclear deterrent (although this is a contested position within the party) and has also indicated support for AUKUS.⁵⁰

While President Biden has indicated an intention to run for a second term, his age is giving rise to speculation about his capacity to continue in office. All three of the original AUKUS leaders could therefore be out of office before the agreement delivers tangible progress on any defense capability plan. Would a re-elected Donald Trump continue AUKUS? It must be said that while Trump was skeptical of NATO, in office he was a strong supporter of the alliance with Australia and bilateral partnership with the U.K. Much could depend on how Trump or any future Republican President might choose to engage with Beijing.

A further risk is that once the 18-month study into Australia's nuclear propulsion options is concluded in March 2023, U.S. officials might conclude that Australia does not have the capacity or resolve to adopt nuclear propulsion. By then, the Albanese government will have a clearer sense of the cost involved. A Labor government might conclude that the cost is too high, although against that, Labor would have to balance the negative implications for wider alliance cooperation.

Alliance relationships work best when they are delivering practical outcomes that benefit all parties. In short, AUKUS needs some practical results, including in areas where the fast delivery of capability will show the value of each country's changing long-standing industrial and procurement practices. While that is clearly the aim of officials working on AUKUS delivery, we should not underestimate the challenges. Will the U.S. Congress, for example, really support the early delivery of a Block IV *Virginia*-class SSN to Australia ahead of the U.S. Navy's own requirements? To date, congressional backing for AUKUS has been vocal and impressive, but in all three countries, local industrial and political perspectives will have to be acknowledged.

On balance, there is more for the AUKUS countries to gain by continuing cooperation under the agreement than there is by backsliding. Biden's personal investment in AUKUS is such that a failure to deliver tangible outcomes would damage the Administration's position, particularly in the Indo-Pacific region, weakening future options for the U.S. military posture in the Western Pacific. For Australia, the costs of an AUKUS backdown would likely have an election-losing consequence for any Australian government. The U.K. has perhaps the least to lose if AUKUS fails to deliver, but London has much to gain if it can shape a closer industry and technology relationship with Washington.

Conclusion

Speaking at Singapore's Shangri La Dialogue in June 2022, U.S. Secretary of Defense Lloyd J. Austin summed up the value of AUKUS:

That's another reason why our new security partnership with Australia and the U.K. is so important. AUKUS won't just deliver nuclear-powered submarines. It holds out the promise of progress across a range of emerging tech areas that can bolster our deterrence, from AI to hypersonics.⁵¹

The defining words here are surely “the promise of progress.” AUKUS offers a remarkable new stage of alliance cooperation that will substantially lift Australian defense capabilities and strengthen allied military forces in the Indo-Pacific with exotic new technology. If AUKUS succeeds, it will be transformative. If for whatever reason AUKUS fails, that would do lasting damage to the United States’ position in the Indo-Pacific and to the position of the U.K. and Australia as America’s closest allies. The next 12 months will be hugely consequential as officials work to deliver a viable path forward.

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Recruiting the All-Volunteer Force: New Approaches for a New Era

Richard Brady

The National Defense Strategy defines the enduring mission of the U.S. Department of Defense (DOD) as providing combat-credible military forces to deter war and protect the security of our nation. This requires the fielding of sufficient capable forces to defeat America’s enemies and protect the American people and our vital national interests.¹

In 1973, the U.S. military undertook a dramatic change in how it populated the services, moving from a model that relied on a combination of young Americans who wanted to join and those who were drafted by order of the government. The volunteer or recruited model has been a feature of the military since the country was founded, and the services have made all sorts of efforts to attract young men—and later, women—to join the military. Recruiters have appealed to a sense of patriotism, a desire for experience or education, health care benefits, or even a steady paycheck.

During periods of war, when the size of the military needed to be increased dramatically and very rapidly, the country employed a draft to fill the ranks, especially when casualties from combat needed to be replaced even by the unwilling. But the Vietnam war, occurring as it did during a period of great social and political upheaval in the U.S., led to a great rethinking about the military and what it needed to be. While not always the case, compelling draftees to serve in a controversial war during a time of domestic discord led to disciplinary problems in the military and declines in unit cohesion, effectiveness, and morale. The all-volunteer force (AVF) model was meant to improve the professionalism of the force, which it has, but it also depends on success in convincing young Americans in large numbers to join the force.

We are now seeing some substantial problems. Changes in American culture, the rise of new technologies used by American youth to interact with the world around them, and fewer opportunities to be exposed to the military are making the recruiting effort extraordinarily difficult. Beyond making it harder to meet annual recruiting goals, this potentially calls into question the AVF’s viability and demands a number of improvements to and adaptations within the “accessions enterprise” if we are to continue to have the most competent, professional military possible.

Military accessions—the process of recruiting, qualifying, and conducting initial entry training—is vital to our national security interests. Its operating environment is constantly evolving, and the organizations involved must respond in kind to remain relevant and accomplish their missions. This is particularly true of the recruiting portion of the accession environment, as recruiting tends to be the most visible and significant aspect of accessions. Recruiting is constantly affected by changing applicant demographics and expectations, service requirements and demands, accession policies, threats and security requirements, and technologies.

The accession enterprise is made up of three components:

- The service recruiting commands;
- The United States Military Entrance Processing Command (USMEPCOM); and
- The service recruit training sites.

Each component has a vital role in supporting the DOD mission by ensuring and supporting the quality and quantity of the AVF. Given some significant changes in the recruiting environment, all participants in the process must adapt their systems, processes, organizations, and mindsets to meet the annual requirement of recruits in an AVF.

The military accession enterprise is experiencing structural, political, social, and technical shifts on a scale not seen since the all-volunteer force was adopted in 1973. It has been 50 years since the U.S. last drafted people, and the military services must address these shifts if they are to continue to be successful in populating our military with young Americans who are willing to serve our country.

Military recruiting involves actions and activities taken by a service to identify and attract individuals in sufficient numbers to meet organizational needs. These actions include marketing, advertising, influencing, and educating to generate a pool of desirable candidates, enhance their interest and attraction to military service, and increase the probability that these individuals will enlist. Among the organizational needs to be met by this process are the end strength objective for each service (how large it needs to be) and personnel with the aptitude and skills required to serve in technical fields.²

DOD recruiting data highlight the challenge involved in accomplishing the accession mission.³ Service recruiting productivity and resultant USMEPCOM and service recruit training throughput continue to be challenged by the COVID-19 pandemic, which has resulted in limited access to high school students and large student gatherings. But the COVID-19 challenges tell only part of the story. The COVID-19 pandemic exacerbated systemic issues—changing demographics, propensity, standards, technology, and methods—within the accession environment that had been building for years, and it will take more than the end of the pandemic to resolve them.

The services have limited levers to influence near-term recruiting results. For applicants, these levers include waiving tattoo policies, weight standards, and education standards and providing higher enlistment bonuses. Recent headlines indicate that service recruiting commands are attempting to use a mix of these levers to improve recruiting outcomes in fiscal year (FY) 2022.⁴ Similarly, the services can increase recruiter productivity in the

near term through promotion and duty assignment preferences, monetary incentives, and involuntary extension of productive recruiters.⁵

The more important levers reside at the policy and societal levels where the quality and quantity of military service inductees can be properly balanced with a focus on long-term outcomes and costs to the accession enterprise. These levers include medical policies and standards, testing policies and standards, and youth propensity to serve. An appreciation for the role these levers play requires an understanding of the complex interplay of the organizations involved as well as the history of accession standards.

A Balance of Interests: The Accession Triad

The first leg of the accession triad includes the military service recruiting commands. Under Title 10 of the United States Code:

The Secretary concerned may accept original enlistments in the Regular Army, Regular Navy, Regular Air Force, Regular Marine Corps, Regular Space Force, or Regular Coast Guard, as the case may be, of qualified, effective, and able-bodied persons who are not less than seventeen years of age nor more than forty-two years of age.⁶

The service secretaries carry out this mission largely through the recruiting force with oversight from service headquarters.

In terms of a supply chain, the service recruiting commands are the first step in a long process that eventually results in military servicemembers being fielded to operational commands and adding to military readiness. Collectively, the service recruiting commands employ more than 20,000 recruiters worldwide to meet their annual recruiting requirements. Within the accession triad, service recruiting results receive the most visibility, as annual goals are used by both the public and private sectors to gauge military readiness and the willingness of young Americans to serve their country in uniform.

In 1976, the Secretary of Defense established the United States Military Entrance Processing Command, the second leg of the accession triad. Initially established as a Department of the Army field operating agency under the jurisdiction of the Deputy Chief of Staff for Personnel, USMEPCOM was led

by a commanding general who was also commanding general of U.S. Army Recruiting Command. This arrangement remained in place until 1979 when USMEPCOM became a DOD field operating activity reporting to the Office of the Under Secretary of Defense for Personnel and Readiness. This arrangement gave the Secretary of Defense greater oversight of the accession process through USMEPCOM's mission of evaluating applicants by applying established DOD aptitude, medical, and moral standards during processing for military service.

The Secretary of Defense's authority over USMEPCOM and the accession process helps to ensure equality of opportunity for all eligible applicants for military service. The DOD uses common entrance qualification standards for enlistment, appointment, and induction across all military services. This helps to avoid inconsistencies and inequities linked to ethnicity, race, religion, or gender. Moreover, this enables the judgment of suitability for military service on the basis of an applicant's adaptability, potential to perform, and conduct.⁷

The third leg of the accession triad is the service recruit training mission. The services, including the U.S. Coast Guard, maintain nine recruit training sites with the mission to transform civilian volunteers into professional servicemembers who are disciplined, fit, acculturated, and combat ready. To increase the likelihood of success, the service recruit training commands desire new recruits who are at high levels of medical and mental readiness before the start of training.

All components of the accession triad—recruiting, USMEPCOM, and recruit training—must work cohesively to enlist approximately 250,000 men and women into the U.S. armed forces annually. This requires not only the integration of policies and systems, but also the balance of incentives and desired outcomes at each step of the process. Recruiting has the dual mission of quantity and quality with the former taking precedent over the latter. USMEPCOM has a near singular focus on quality and adherence to accession standards. Recruit training focuses on individual recruit readiness, which is a function of quality and training standards.

Because of the divergent incentive structure, there is a natural tension among the three elements of the triad: recruiting, USMEPCOM, and recruit training. This tension has generally led to positive outcomes for the accession enterprise, allowing it

to meet quality and quantity metrics in most years. However, when recruiting quantity metrics begin to fall short, as experienced in FY 2022, the tension builds, upsetting the balance between quality and quantity.

The military services must enlist a sufficient quantity of recruits to fill units in the operating forces and maintain readiness. If the quantity of recruits falls short, then the services must restructure operational units to ensure combat effectiveness.⁸ In terms of cold, hard metrics, quantity is valued more than quality. This has been true in both peacetime and in war. But starting in the early 20th century and as medicine and cognitive testing evolved, it became more difficult to ignore the quality aspects of recruits and the medical and mental fitness impacts on readiness.

Evolution of the Accession Process

Today's modern accession standards originated with the United States' entry into World War I. The declaration of war signed by President Woodrow Wilson on April 6, 1917, set in motion what would become by the end of the war the largest coordinated system of human resource selection, classification, training, and assignment ever implemented. During the 18 months the nation participated in World War I, uniform standards were devised to screen out the medically unsuitable and to assess the aptitude capabilities of enlistees. Medically, screening for tuberculosis was a priority as TB was a leading cause of death at the time. Height and weight standards were also first applied with uniformity during the World War I era.⁹ The application of these standards resulted in far more rejections of prospective servicemembers for underweight than for overweight.

World War I also witnessed the advent of aptitude testing. The Army Alpha test consisted of eight subtests and served as a prototype for later test development. The Army Beta test was one of the first paper-and-pencil tests to evaluate the aptitude of recruits who had little or no schooling or who did not speak English. Both tests were eventually replaced by the Army General Classification Test (AGCT).

More than 20 years later, World War II presented the nation with an even more monumental mobilization effort. By the time the wartime selective service laws expired in 1947, more than 10 million men had been inducted into the military services. The physical standards for induction were first published by

the War Department in 1940.¹⁰ They were used by local draft board physicians and physicians at Joint Army and Navy Induction Stations. The physical standards changed as the war progressed, as medical science advanced, and as the needs of the War Department evolved. The most extensive changes involved dental and visual acuity standards and the PULHES physical classification system, all of which are still in use today.¹¹

In 1948, an interservice working group was created to develop a single aptitude test for use by all services. This effort resulted in the introduction in 1950 of the Armed Forces Qualification Test (AFQT). The AFQT served as a screening device, determining an applicant's overall capacity to absorb military training, and provided a uniform yardstick with which to predict the individual's potential for success while in service.

The AFQT did not aid in job classification. For this, the services employed their separate examinations or specialized tests. In 1974, the DOD selected the Armed Services Vocational Aptitude Battery (ASVAB) as the single instrument of choice to screen applicants both for enlistment and for occupational classification testing. This streamlined the testing process and enhanced the individual service's ability to match applicants with jobs and provide job guarantees to applicants who qualify. In 1976, the same year USMEPCOM was established, a revised version of the ASVAB became the enlistment eligibility test DOD-wide.¹² Refined and improved versions of the ASVAB continue to serve in the 21st century.

Medical fitness standards continue to be refined to keep pace with current trends in public health and advances in medical science and military requirements. Audiometric standards were added and hearing tests became routine.¹³ Screening for HIV was mandated in the 1980s for all persons entering the services.¹⁴ USMEPCOM incorporated International Classification of Disease (ICD-10) codes in 2015,¹⁵ and updated standards related to transgender applicants and the pandemic diseases were added between 2017 and 2021.¹⁶

Today, the DOD regularly evaluates the medical and testing standards applied to accession based on emerging science, research, and advances in technology. These efforts, intended to balance cost and performance in military enlistments, are nonetheless influenced by politics and public opinion. The shifts in policy governing military service

for transgender individuals between 2018 and 2021 and the COVID-19 medical standards and vaccine policies of 2020 and 2021 are cases in point. While these policies are of interest from a societal or public health perspective, their impact on military readiness is hotly debated. One thing is quite clear, however: They increase both the cost and the level of effort needed to recruit military personnel.

Levers of Control: Medical, Testing, and Propensity

The United States Army is projected to miss annual recruiting goals in FY 2022 and FY 2023, falling short by as many as 40,000 new recruits. General Joseph Martin, Vice Chief of Staff of the Army, identified the unprecedented challenges presented by the COVID-19 pandemic environment, the labor market, and competition with private companies as key factors that negatively impact recruiting.¹⁷ These challenges have affected recruiter productivity by largely prohibiting large group events, curtailing widely attended sports or school events, and limiting the impact of traditional incentive schemes like bonuses. The Army, Army Reserve, and Army National Guard are the recruiting bellwether for all of the military services, accounting for nearly 50 percent of the annual DOD accession goal of 250,000 recruits.

The traditional model of recruiting, which was effective before the COVID-19 pandemic, will not suffice in a post-COVID environment. Understanding this requires understanding the structural issues that determine whether a potential recruit desires to serve and is qualified to join. Finding medically fit, academically proficient, and motivated men and women is the foundational issue in military recruiting.

Medical. DOD Instruction 6130.03, Volume 1, "Medical Standards for Military Service: Appointment, Enlistment, or Induction," establishes baseline accession medical standards.¹⁸ All applicants complete the same accession medical history process, which requires self-disclosure of medical history, authorization given to the military to access personal medical records, and a physical examination by a licensed medical professional.

Uniform accession medical standards reduce the risk of long-term negative outcomes both for the servicemember and for the military services. The intent is to not aggravate any preexisting physical or mental health condition that might lead to the injury or death of the servicemember or a long-term cost

to the government from a permanent disability. The stress of military service can result in a reoccurrence of some previous condition, whether resolved or unresolved. All components of the accession enterprise have a shared goal: finding young adults to meet the mission requirements of the military services and ensuring that they have every opportunity to pursue a successful military career.

Accession medical standards are based on advances in medical science, changes in public health, operational needs, and prerogatives of the DOD and military services pertaining to sociopolitical or cultural issues. They are designed to ensure that individuals are physically and psychologically qualified and capable of performing the strenuous military duties that are often associated with wartime activities. This requires the applicant to be available for worldwide duty without restriction or delay; able to tolerate exposure to stressful, dangerous, and harsh environments; and able to operate dangerous, sensitive, or classified equipment.

Applicants with conditions that would normally disqualify them are reviewed on a case-by-case basis by the relevant service to determine whether a medical waiver can be issued. Each service has its own waiver policy that typically calls for more information about the condition of the individual and treatments available to mitigate risk associated with the medical condition. This additional information helps the service to make a risk-informed decision on the applicant. Conditions that are more rarely waived include those involving behavioral health, including self-mutilation, suicidal attempts or gestures, major depression, bipolar disorder, or other similar conditions.

As important as the military recruiting and accession processes are, they rely heavily on a patchwork of outdated technology and paper-based data collection for medical history. Until recently, this process was seen to serve both the needs of DOD and those of the services even though it was based on the assumption that the medical record provided by the applicant was complete and accurate. Based on this assumption, the DOD thought it was able to apply stringent accession medical standards, and this gave the impression that high quality standards were being met even though the services were recruiting applicants with largely unverifiable medical histories.

Various studies and reports over the years identified this shortfall in validating applicant disclosure

of medical history, which led to Existing Prior to Service (EPTS) attrition (early discharge of the servicemember because of undisclosed medical problems revealed during the servicemember's first enlistment) and high costs to the DOD at recruit training and during first-term enlistment.

USMEPCOM data consistently show that almost 50 percent of all EPTS attrition in all services is due to applicant nondisclosure of medical information.¹⁹ The principal reasons for EPTS in all services are (in order) psychological, orthopedic, and asthma (pulmonary). Applicants for military service undergo a USMEPCOM medical screening that includes a physical exam; urinalysis for protein, glucose, and illicit drugs; hearing; and vision.²⁰ Applicants complete a report of medical history as well as behavioral questionnaires, both of which require the applicant to disclose any conditions, particularly in behavioral health, that would normally be disqualifying.

For various reasons, from willful nondisclosure to poor recall, applicants tend not to reveal such information. According to a 2016 Accession Medical Standards Analysis and Research Activity (AMSARA) report, "the great majority of EPTS discharges are for medical conditions that were not discovered or disclosed at the time of application for service, with concealment by the applicant being the most common scenario."²¹ Since these instances of nondisclosure are not uncommon, obtaining applicant medical and/or prescription records helps USMEPCOM medical providers to make the appropriate qualification decisions. In addition, the services, through their Service Medical Waiver Review Authorities (SMWRA), are better informed when conducting risk assessments during waiver reviews. In most cases, the relevant military medical authorities are able to acquire this important information, but the time needed to do so also means that it takes longer to process the applicant.

Between 1997 and 2017, the Government Accountability Office (GAO) made several recommendations to improve recruit medical screening processes at USMEPCOM. The GAO's 1997 report recommended that DOD develop methods to verify applicant medical history to decrease issues of nondisclosure that could lead to recruit injury, attrition, or even death.²² Its 2017 report highlighted concern with the lack of electronic interfaces between USMEPCOM and electronic medical information

holders that would otherwise make it easier for Military Entrance Processing Stations (MEPS) to obtain medical history information.²³

In 2016, USMEPCOM was directed to gain access to authoritative health information through a fully automated and electronic health record system to reduce the number of EPTS discharges and respond to the various problems noted in government reports. USMEPCOM conducted assessments, pilots, and initiatives between 2016 and 2020 to obtain this information and prepare for implementation. These efforts resulted in a system-of-systems approach that began with formal pilot programs in 2020 and an implementation plan in 2021.

Medical modernization in USMEPCOM encompasses multiple systems that collectively provide access to an applicant's health information and electronic health records. The systems include:

- **MEPCOM Integrated Resource System (MIRS 1.1).** MIRS is a cloud-based, enterprise processing system that provides centralized control and interface for accessions.²⁴ Deployed in 2021, MIRS features increased maintainability, usability, security, and scalability compared to legacy systems. It supports medical processing through the scheduling and reporting of medical exams.
- **Health Artifact and Image Management Solution (HAIMS).** HAIMS provides global visibility and access to records and images generated during health care delivery.²⁵ With access available at all MEPS and service recruit training sites, HAIMS supports the digitization and transmission of accession health records while reducing personally identifiable information (PII) and personal health information (PHI) exposure.
- **Joint Longitudinal Viewer (JLV).** JLV provides an integrated, read-only view of electronic health records from the DOD, Department of Veterans Affairs (VA), and health information exchanges.²⁶ JLV primarily contains health information on prior service applicants and the dependents (spouses and children) of military servicemembers. It utilizes electronic health records held by DOD and VA to provide prescription history for beneficiary populations.

- **Prescription Medication Reporting System (PMRS).** A commercial application used primarily by the insurance industry, PMRS provides pharmacy history reports on individuals, including prescription drug dosage and refill information.²⁷ PMRS primarily covers insured applicants who have no prior military affiliation and is compliant with both the Health Insurance Portability and Accountability Act (HIPAA) and the Fair Credit Reporting Act.
- **Military Health System (MHS) GENESIS.** MHS GENESIS is the next-generation DOD, VA, and Department of Homeland Security (for U.S. Coast Guard) electronic health record that covers accession through retirement.²⁸ MHS GENESIS is a fully digital system that leverages authoritative data and reduces reliance on paper-based processes.

Collectively, these systems provide end-to-end electronic health record coverage and access to authoritative health information while fully digitizing the accession medical process in a cloud-based environment. From an enterprise standpoint, they improve qualification decisions, reduce recruit training attrition (EPTS), and enhance policy formation at the DOD and service levels.

In December 2021, USMEPCOM initiated the Medical Review of Authoritative Data (MROAD) program as the first step to address the problem of applicant nondisclosure. MROAD makes it possible for the military to obtain applicant prescription histories that are used to identify medical conditions contributing to avoidable attrition.²⁹ MROAD leverages two complementary systems: JLV and PMRS. The data obtained from JLV and PMRS reports allow for a more comprehensive picture of applicants' medical histories.

In early 2020, USMEPCOM used MROAD to assess the use and impact of JLV and PMRS in the medical evaluation process. Only records of applicants already shipped to recruit training were reviewed so that the assessment did not affect actual qualification decisions. After reviewing the records of 1,545 applicants between April and June 2020, USMEPCOM found that nearly 7 percent of applicants had a prescription history suggesting non-waiverable medical conditions.³⁰ Further analysis indicated that approximately 83 percent of applicants would be

fully qualified during the physical exam with an additional 10 percent receiving service medical waivers.

The net impact on qualifications confirmed that applicants were not disclosing potentially disqualifying conditions, as the disqualification rate increased by nearly 7 percent overall. It was estimated that the savings associated with better qualification decisions totaled nearly \$1 billion per year for the DOD and services at a financial cost of only \$5 million per year. Interestingly, the results of the review also revealed that an additional 21,000 applicants need to be recruited each year to offset the number that are medically disqualified during prescreening for the services to meet their annual recruiting goals.

The individual applicant findings were somewhat more startling. When the prescription history of applicants who had already assessed and shipped to recruit training during 2020 were reviewed, it was found that many had undisclosed, significant mental health conditions that would not be compatible with military service or success at recruit training. Examples included:

- An applicant with 232 prescription fills for multiple psychiatric medications,
- An applicant with over 100 prescription fills for ADHD and anti-depressives, and
- An applicant who was prescribed lithium for bipolar disorder.

Such cases would not normally be granted a waiver for enlistment by the military services, yet they somehow “slipped through the system.”

The decision to implement MROAD in actual qualification decisions was made in 2021. DOD developed several courses of action (COA) that balanced the need for medical modernization with the realities of the recruiting environment. While varying somewhat in their implementation start date and the use of medical history reports during the course of the accession process, all of the COAs recommended better use of both electronic and paper medical records to determine whether an applicant needed a more comprehensive physical examination.

Perhaps not surprisingly, the positions of agencies involved in the decision to implement recommendations varied greatly, depending on their missions and roles in the accession supply chain.

- USMEPCOM had processes and procedures in place to implement the use of PMRS and JLV when directed. This initiative addressed the historical problem of applicant nondisclosure of medical history and would have allowed USMEPCOM medical providers to make better informed risk-based decisions. The use of authoritative health information would also reduce the variance in medical decision-making and EPTS attrition, nearly 50 percent of which is due to applicants failing to disclose medically disqualifying information.
- Service recruiting commands were hesitant, preferring to implement MROAD in FY 2023. The ongoing COVID-19 pandemic, inability to gain access to schools and conduct large-scale events, and a young, less experienced recruiting force had created challenges to meeting recruitment goals. Recruiting commands were concerned that implementation of more stringent medical screening practices would decrease the pool of eligible applicants and increase the workload for recruiters. Any additional barriers to entry were seen as counterproductive.
- The Council on Recruit Basic Training, an organization made up of the commanders and commanding generals of the service recruit training commands, supported medical modernization efforts if they reduced EPTS attrition at the initial entry training sites. Identifying medically disqualifying conditions would arguably prevent injury or death, minimize attrition rates, and increase graduation rates. Furthermore, applicants approved through the waiver process would sustain fewer injuries/illnesses if preventive measures were available.
- Service medical review waiver authorities largely favored the use of authoritative health information in the accession process because it provided a more holistic picture of an applicant’s medical history and allowed for better determinations in cases involving medical waiver requests.

The DOD directed the implementation of MROAD beginning in FY 2022³¹ against the strong reservations of the services. USMEPCOM was

directed to provide implementing procedures to the services before the initiation of MROAD and to conduct an assessment of the program after six months of use. Military applicant medical disqualification rates began to increase immediately following the implementation of MROAD in December 2021. Additionally, the increase in the quantity of medical history that MEPS medical providers needed to review increased the timeline for medical evaluations. These two factors—higher disqualification rates and longer timelines—increased the risk of missed recruiting goals for the service recruiting commands. The services voiced their concerns in early 2022, and DOD decided to pause the MROAD program in anticipation of the deployment of MHS GENESIS.³²

USMEPCOM deployed MHS GENESIS in the second and third quarters of FY 2022. Similar to the deployment of MROAD, the services strongly objected to the deployment of MHS GENESIS. They continued to be concerned about the negative impact that increased medical disqualification rates would have on service recruiting efforts, particularly in a year when all military services are struggling to meet their recruiting goals. Despite these concerns, determining that the improved quality of military applicants outweighed the services' concerns about quantity and given the difficulty of the recruiting mission in FY 2022 and the likelihood that the services would miss recruiting goals in any event, DOD determined that FY 2022 was the best time to deploy MHS GENESIS.

The deployment of MHS GENESIS marked the most significant change in medical qualification in a half-century and was the result of decades of work and research. USMEPCOM moved from a paper-based system to a modern health care system that provides “a single health record for service members, veterans, and their families”³³ as well as better, more responsive access to authoritative health information. Its use not only has the direct impact of improving the quality of recruits enlisted in the military, but also provides improved insight into the overall health of the U.S. armed forces. These long-term benefits should not be outweighed by the short-term impacts being experienced by the service recruiting commands in meeting their quantity goals.

Cognitive and Non-Cognitive Testing. The ASVAB is the world's most widely used multiple-aptitude test battery and became so widely used

because of the evolutionary process by which it was developed and implemented—a process in which the U.S. armed forces have played a central role.

The process of administering standardized tests at the beginning of the 20th century was time-consuming and costly and required highly trained administrators. In 1917, American Psychological Association (APA) President Robert Yerkes urged the APA to contribute to the war effort by helping to find a way to assess recruits.³⁴ The APA formed numerous committees, one of which was charged with developing a group intelligence test that could identify men with low intelligence and those who were well-prepared for special assignments or higher-level training.

Their efforts resulted in the Army Alpha and Beta tests, introduced in 1917.³⁵ The Army Alpha was a written test for literate recruits. It had various parts, including analogy recognition, missing number fill-ins, and sentence unscrambling. These types of questions are still common in modern IQ tests. The Beta version was used for men who did not speak English or were illiterate. It also had several parts, including a maze, number work, and picture completions. The Alpha and Beta tests could be administered to large groups and took less than an hour to complete. By the end of World War I, more than one million people had taken the Army Alpha and Beta tests.

The Army used the tests for two primary reasons: to improve the assigning of new recruits and to allow military leaders to gain a better understanding of their soldiers' individual abilities. The first tests were just the beginning of the journey for intelligence and aptitude testing within the U.S. military.

During World War II, each service used its own assessment procedures before an individual's induction. The War Department also began to use the Army General Classification Test and Navy General Classification Test to classify enlisted personnel.³⁶ These tests included questions on vocabulary, arithmetic, and block counting. More than nine million people took these tests during the war.

In 1948, Congress passed the Selective Service Act, which mandated that the newly formed DOD should develop a uniform screening test to be used by all of the services. In response, DOD developed the AFQT.³⁷ DOD began to administer the AFQT in 1950 and continued to administer it until the mid-1970s. The AFQT consisted of 100 multiple choice questions in vocabulary, arithmetic, spatial relations,

TABLE 1

Armed Forces Qualification Test: Categories and Score Ranges

SOURCE: Armed Services Vocational Aptitude Battery, “Understanding ASVAB Scores,” <https://www.officialasvab.com/applicants/scores/> (accessed August 9, 2022).

Category	Score Range
I	93–99
II	65–92
IIIA	50–64
IIIB	31–49
IVA	21–30
IVB	16–20
IVC	10–15
V	1–9

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and mechanical ability. DOD used the AFQT to measure the “general trainability” of draftees and volunteers for all of the armed services.

In 1966, the DOD began to develop a single battery for all of the services. In 1968, the DOD first offered the ASVAB at no cost to high schools and postsecondary schools. By 1976, DOD introduced the ASVAB as the official aptitude test for all of the services.³⁸ Since that time, the DOD has improved the ASVAB program, most notably with the inclusion of the Career Exploration Program (CEP). Administered to over 500,000 high school students annually, the CEP is used by school counselors to encourage students to increase their level of self-knowledge and understand how that information is linked to military and civilian occupational opportunities.

For recruiters and potential recruits, the ASVAB test’s most important score is the AFQT, which is computed using scores from four subtests: Arithmetic Reasoning, Mathematics Knowledge, Paragraph Comprehension, and Word Knowledge. The AFQT score is a percentile ranging from 1–99 and is normed based on a sample of 18-year-old through 23-year-old youth that was collected in 1997, resulting in a bell curve in which an AFQT score of 50 represents an average result. The AFQT scores are further broken into eight categories, as depicted in the accompanying table.

The military services are required to report the number of military applicants enlisted under each category. The service recruiters are strongly encouraged to enlist AFQT Category I, II, and IIIA applicants and to limit AFQT IIIB applicants. Generally,

the services will not enlist applicants below Category IIIB without a waiver.

The difficulty involved in finding sufficient numbers of AFQT Category I, II, and IIIA applicants has led the services to explore non-cognitive testing as an alternative way to assess American youth for their potential to succeed in military service. These non-cognitive tests, the most notable being the Tailored Adaptive Personality Assessment System (TAPAS), identify behavioral skills and attributes like grit, resilience, or coping that predict success in an endeavor. Nearly all of the military services have administered or are administering the TAPAS test to military applicants, and the Army was administering it on a limited basis as early as 2012. However, none of the military services has fully integrated the TAPAS scores into its enlistment-related decision-making.

Service recruiting commands and advocacy groups have asked that applicants be allowed to use electronic calculators when taking ASVAB tests and that testing be provided in a language option other than English (for example, in Spanish). The thought is that the use of calculators and testing in a native language will increase the pool of qualified applicants. However, these proposals present multiple challenges. ASVAB testing questions have not been developed with calculators in mind, and the test has not been normed with applicants who used calculators. As a result, allowing calculators to be used in ASVAB testing would likely have only a marginal impact on the number of qualified applicants. In addition, military training is conducted

in English, so applicants who are not proficient in English would likely struggle with and possibly fail in training because of their inability to comprehend the training materials.

The most viable way to increase the pool of qualified applicants would be to use a blend of cognitive and non-cognitive tests to determine suitability and enlistment. For example, ASVAB Category IV applicants who would otherwise not be considered for enlistment could be granted a waiver if they have a high TAPAS score. As all the services are currently administering the TAPAS test to prospective recruits, this blended approach could be implemented quickly and at a fraction of the cost of other options. The blended approach represents a step-increase in testing capability, increasing the enlistment eligibility (qualification) of the current and prospective pool of recruits while also improving the classification of recruits to improve success rates in military service.

Propensity. While the DOD as a whole and the military services individually develop and implement policies to identify high-quality prospects for military service and increase the odds that such service will be successful, they also work to understand the attitude of youth toward military service. This is key to marketing efforts that link the military to American youth.

One of the DOD's greatest challenges is a significant decline in the propensity to serve among America's youth and a corresponding negative trend in views of the value of military service among key "influencers" that shape their opinions. This decline has been influenced by a combination of factors such as:

- A shrinking military footprint in many areas of the country (resulting in less opportunity for youth to have personal contact with anyone in the military);
- Low unemployment rates (plenty of job opportunities in the civilian sector);
- Improved access to college and higher education; and
- Years of prolonged overseas conflict for the military (implying that anyone joining the military would have a similar experience).

These factors have created conditions in which the intrinsically motivating elements of military service have become less self-evident to the youth market while the sacrifices of service in terms of physical, psychological, and quality-of-life consequences remain top-of-mind. Today's youth view military service as fraught with risk and sacrifice without unique rewards or advantages. The distinguishing outcomes that youth associate with joining the military often include physical injury, constant deployment, family separation, post-service unemployment, and trouble reintegrating into society. These views are often reinforced by the media, national headlines, and family influence.

Moreover, the increased political polarization of America has crept into perceptions of military service. The military is portrayed negatively as either a breeding ground for racist, extremist, or insurgent behavior on the one hand or weakened by "woke," fragile, and social experimentation policies on the other. Both portrayals, neither of which is either true or productive, undermine youth propensity to serve and therefore military recruiting.

To counter these challenges and help reimagine the military for today's youth, the DOD initiated a series of influencer media campaigns. The messaging was intended to increase awareness of the opportunities of military service, advocate for the benefits of public service, and overcome the misinformation with respect to the risks associated with military service.

The Joint Advertising, Market Research and Studies (JAMRS) program is the DOD office for military advertising, market research, and studies related to recruiting.³⁹ JAMRS uses annual surveys to explore the perceptions, beliefs, and attitudes of American youth as they relate to joining the military. Understanding these factors is critical to success in sustaining an AVF and helps to ensure that recruiting efforts are directed in the most efficient and beneficial manner.

JAMRS survey results show a steady decline in the general propensity to serve in the military among youth ages 16–21 between 2018 and 2021, reaching a low of 10 percent in the summer of 2021.⁴⁰ At low levels of propensity, all resources supporting the recruiting mission must work harder for the services and DOD to make annual recruiting goals. For the first time, a majority of youth have never considered the military as an option, even though economic hardships and uncertainties persisted throughout the COVID-19 pandemic.

Additionally, only 23 percent of America's youth are eligible to enlist in the military without a waiver.⁴¹ Disqualifying factors include overweight, drug use, adverse medical conditions/history, adverse mental health condition/history, low aptitude and education, poor conduct, and having dependents (a spouse, child or children, or other family members who depend on the potential enlistee for support). Nearly half of all youth who are ineligible are so for multiple reasons. This situation is exacerbated by low youth propensity and the difficulties recruiters have in engaging youth in a fragmented social and cultural landscape with limited resources.

Most youth do not seek information about serving in the military and are not motivated to look past the stereotypes presented in our culture. Emergent concerns around sexual harassment and assault in the military are at an all-time high: Nearly one-third of eligible youth cite this as the main reason why they would not consider joining the U.S. military. Significant growth in the number of media platforms, including traditional media, social media, and digital media, requires outreach resources to work harder and be targeted so that they reach intended markets more effectively.

The disconnect between the youth population and the military has been exacerbated by current events, creating a perfect storm for military recruiters. The restrictions on in-person engagements imposed because of the COVID-19 pandemic have left recruiters at a disadvantage in cultivating and maintaining relationships with both the broader market and the low-propensity segments of that market. As many recruiters will relate, it is much easier for a potential applicant to “ghost” them, either by not responding to efforts to contact them or by ignoring follow-on efforts once an initial contact is made, if they have met only online. Additionally, many recruiters lack the social media skills and authorities to engage with potential applicants in the digital platforms where they are most likely to be found.

Nonetheless, recruiting remains a very personal business. Unlike transactional sales, recruiting for military service is more akin to a serial sales model where a recruit must be sold multiple years of service. This requires face-to-face interactions not only with the prospective recruit, but also with his or her family, friends, and other influencers. For most successful recruiters, this is not a “9 to 5” job; it is one that requires significant evening and

weekend engagement to achieve recruiting goals. Individual recruiter engagement with prospective applicants is therefore extremely important and must be measured across multiple metrics to ensure that the front end of the accession pipeline remains productive.

Market indications are problematic for military recruiting in both the short and long terms. Many youth aspire to a lifestyle that maximizes work-life alignment, which they do not perceive as being available with military service. The military recruiting services have not adjusted their messaging to account for this change in youth attitudes. Doing so will come at increased cost, but it will also help to attract high-quality, eligible, and diverse youth. Experience has shown that support for AVF recruitment requires adequate and sustained resources. The services must have the resources to make timely investments in the number of recruiters, marketing and advertising efforts, and enlistment bonuses to mitigate the adverse effects of such a challenging environment.

Modernizing Military Accessions

The military accession process must evolve to achieve the quality standards and quantity requirements that are needed to maintain military readiness. Industrial age accession practices, based on large-scale batch processing, need to be replaced by data-driven and targeted strategies. The COVID-19 pandemic served as an inflection point for the accession enterprise, highlighting systemic issues in the accession model while prompting the development of potentially transformational programs to modernize the process. At present, the military services are failing to leverage new tools to achieve their recruiting goals at the very time when American youth are increasingly ineligible to serve and have less desire to serve.

While challenging, the recruiting environment does present an opportunity to emerge from the COVID-19 pandemic with a new accession model that is built on modern medical standards and technologies, integrated cognitive and non-cognitive testing, and the ability to adapt to changing youth attitudes and behaviors. The current incentive structure, which tends to favor quantity of recruits over quality of recruits, does not support this transition. History has shown that the accession enterprise can evolve when there is sufficient dissatisfaction with

the current state, when there is a compelling vision for a future state, and when initial steps are taken toward that future state.

The medical technologies, in terms of authoritative health information and electronic health records, and the cognitive and non-cognitive testing methodologies are in place to be fully integrated into the accession process. The only obstacles that remain are the policy and political will to do so and the institutional resistance to change. Failure to act at this moment will delay implementation for at least another generation and continue to jeopardize military readiness.

Political agendas and public opinion will continue to play a role in the accession process, but their negative manifestations can be marginalized when all of the components needed to identify, engage, recruit, and induct new servicemembers are aligned on outcomes. Understanding the primary levers of control through medical and testing standards, as well as a deep understanding of changing youth attitudes and behaviors, will allow the accession enterprise to achieve its goals in any political, economic, or social environment.

Conclusion

The accession enterprise must build the resilience that is similarly expected of military servicemembers. Recruiting the AVF cannot be a reactive activity; it must be a proactive, initiative-driven effort that engages American youth and convinces them of the value and nobility of serving their country in uniform.

Removing impediments is critical to making progress in this endeavor, and implementing a host of modern systems within the medical screening and recruit processing systems is a huge step forward. Similar efforts are needed in the recruiting system and should receive priority attention not just from senior defense officials, but also from influencers in education, civic organizations, and the sports and entertainment industries. These are the sectors of American society that are in the closest and most regular contact with our youth. If such efforts are not made, the viability of the AVF and, consequently, the security of the country will come into question.

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Determining the Real Cost of the Tools of War

John G. Ferrari, Major General, U.S. Army (Ret.)

A popular low-cost airline advertises one-way flights from New York City to Los Angeles starting at \$61, an undeniable bargain. When you go to book the flight, you realize it is a 13-hour trip, compared to the six-hour nonstop advertised by competitors. Then you notice the five-and-a-half-hour layover in Miami, in a direction the opposite of where you are traveling.

When you continue with your booking, it becomes clear that to choose your seat, bring any sort of personal item on the plane, and check a bag, you will have to spend another \$65—four bucks more than the cost of the flight itself. A carry-on and one-time waived change fee will cost you an additional \$15. Finally, for the right to check in with an agent at the airport, you will be squeezed for an extra \$10. On the payment page, your \$61 flight will have become nearly triple what you would have paid to be afforded the same amenities provided on most other flights (with the exception of complimentary in-flight beverages and snacks), and you have become the beneficiary of an unexpected five-and-a-half-hour pit stop in a Florida airport.

The Department of Defense (DOD) weapons systems and personnel cost estimates and the unnamed low-cost airline have many commonalities including misleading up-front and fixed costs, misunderstood timelines, and operational costs that are often ignored. Why make the comparison? The American public is consuming information from various sources that often mix up, confuse, and make erroneous cost projections for various DOD programs. Just as they need to be better consumers of airline flight information, American taxpayers need to be more well-informed about defense capabilities and better consumers of defense information and security.

With regard to defense costs, there are four key problems with respect to both weapons systems and personnel:

- The failure to include operating and support costs,
- Undefined timelines,
- Poor or nonexistent updating of estimates, and
- Abuse of the English language.

It is clear that some of the most prominent programs and personnel costs in the U.S. military today suffer from inconsistent and incomplete estimations, with one prominent exception: the much-maligned F-35 fighter. As complicated as the estimation process and DOD estimation guidelines are, once he or she knows where to look, anyone can determine where programs fall victim to some of the more common estimation pitfalls.

Although submitting incorrect estimations could eventually lead to bad policy decisions, it is safe to assume that few to none of these inaccuracies are the result of malicious intent. Some estimations, such as those for the F-35 program and the cost of the Iraq War, have serious political implications that may incentivize the cherry-picking of numbers, but consistent problems in DOD estimations result from a number of systemic and procedural issues. This analysis is not meant to forgive misguided budgeting but seeks rather to explain that even the “facts” may not be accurate in the end, whether miscalculations are caused by inclusion or by omission of data. As the U.S. seeks to strengthen the military’s budget, it is critical that policymakers have the right information

at the right time so that they can make the best decisions and Americans can get the most national defense for their tax dollars.

Using and Understanding the Right Defense Budget Terms

How much money does Congress provide for our national defense? This is a seemingly easy question, yet most get it wrong, and they do so mostly because there are three different sets of numbers that get transposed in normal conversation. What the United States spends on national defense is not the same as what the Pentagon spends, which is not the same as how much money is appropriated by the Defense Appropriations Subcommittees of Congress. Understanding the difference between, for example, “basic economy” and merely “economy” is key to understanding what our money is buying.

To start with, the term “national defense”—in the case of resourcing—encompasses much more than the Pentagon and includes programs run by other departments such as the nuclear program in the Department of Energy. This number is often called the “050” budget line number and aligns with the National Defense Authorization Act. For the Pentagon specifically, its funding is often called “051.” But just to make it slightly more confusing, in the congressional appropriation process, the defense appropriation does not include either the Pentagon funds for Military Construction/Family Housing, which are provided by the Appropriations Committee’s Military Construction, Veterans Affairs, and Related Agencies Subcommittee, or the non-Pentagon National Defense funds, which are provided by the Energy and Water Development and Related Agencies Subcommittee.

Table 2 is a helpful guide to understanding these numerical discrepancies and explains why the following sentence incorrectly compares budget resources: “A budget of even \$770 billion [051] would be a significant increase when compared to the \$728.5 billion enacted in law for the Defense Department in FY22 [defense appropriation less military construction].”¹

This is just one example (albeit a simple one) of how the word “defense” has three different meanings depending upon who is using it and when. Now imagine this playing out across different programs or in the context of real versus nominal dollars. Not being specific with defense budget terms can

complicate the analyses of and justifications for billions of dollars in national security decisions. One should never be afraid to ask what is meant by a word: Words matter.

PAUC vs. APUC. Anyone who wants to know how much specific weapons systems or munitions cost should be prepared to be dazzled by two different combinations—PAUC and APUC—and be prepared for both to be used interchangeably or, worse yet, not identified.

PAUC stands for Program Acquisition Unit Cost, which is set in statute and used to define cost reporting requirements to Congress.² It is simply calculated by adding together all of the developmental costs for a program, including program-specific military construction; adding it to the projected cost of production; and then dividing that sum by the total number of systems intended to be procured throughout the system’s lifetime. If you want to make a system appear affordable, be extremely optimistic in how many you plan to acquire: The more you “intend” to buy, the more you spread the development costs, thus driving down the appearance of the per unit price. In this case, imagine you are the airline, trying to raise money from investors. If you assume lots of people on your aircraft for each flight, you can market yourself as a low-cost airline. However, if the passengers do not show up, you are now a high-cost airline.

Within DOD, analyzing the PAUC is important for programs with large up-front development costs and high projected quantities. As a smart consumer of DOD acquisition data, never take the PAUC at face value without understanding those two factors.

The second acronym is APUC: same letters, but this time they stand for Average Per Unit Cost. The APUC is calculated by taking the actual projected cost of production and dividing it by the proposed quantity. Since inflating the quantity does not get you a lower average in this case, how does this number get misused? It is called the “learning curve.” The learning curve occurs when a program assumes that the cost of production will magically decrease over time. Since there is both an art and a science to forecasting the learning curve effect in forecasted pricing, this is an area in which you should be extremely skeptical when comparing different systems.

To see it in practice, consider the recent budget documents for the F-35 and F-15EX. In 2023, the F-35 jets are Block 4 models, and the fly-away cost

TABLE 2

Funding Provided to the Department of Defense

	2021 Enacted	2022 President's Budget	2022 Omnibus	Change, 2021 Enacted to 2022 Omnibus
DOD, Defense Appropriations	\$695.2	\$705.2	\$728.5	4.8%
DOD, MILCON Appropriations	\$8.5	\$9.8	\$14.9	75.3%
Total DOD (051)	\$703.7	\$715.0	\$743.4	5.6%
Non-DOD National Defense (DOE/Other)	\$37.1	\$37.9	\$38.6	4.0%
National Defense Budget (050)	\$740.8	\$752.9	\$782.0	5.6%

SOURCE: Elaine McCuster and John G. Ferrari, “4 Initial Defense Highlights from the 2022 Omnibus Appropriations Bill,” American Enterprise Institute, AEIdeas Blog, March 11, 2022, <https://www.aei.org/foreign-and-defense-policy/4-initial-defense-highlights-from-the-2022-omnibus-appropriations-bill/> (accessed August 11, 2022).

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(APUC) is about \$91.6 million each or \$5 million more than the Block 3 jets, which is straightforward. If the Air Force bought 48 jets, the gross weapons system cost (PAUC) of each fighter would have been \$108 million. By reducing the number of F-35s purchased/denominator to just 33 F-35As, the gross weapons systems cost (PAUC) increases by almost \$8 million to \$115.5 million.

Why would the Air Force do this? Because they want to buy more F-15EXs. Reducing F-35 quantities makes the \$120.2 million PAUC for the F-15EX seem almost even. In other words, \$120.2 million per plane seems a lot more justifiable to Congress when the other option is nearly the same price anyway. Buying only 33 enables the Air Force to level the cost comparisons. All of the math is accurate, but knowing how the costs are calculated is just as important.

Missile Defense Agency: How Excluding Costs “Looks” Cheaper

A common fallacy holds that projected cost estimates are guided by and adhere to a common set of rules and standards and that they cannot be skewed by the agency providing them. The Missile Defense Agency (MDA) has its own acquisition authority

and funding lines; therefore, it does not go through the same bureaucratic process that other agencies must go through inside the Pentagon. Before the Federal Aviation Administration cracked down on the airlines, some of them excluded such things as the Passenger Facility Charge, Flight Segment Tax, September 11 Security Fee (Passenger Civil Aviation Security Service Fee), and Transportation Tax from their advertised fares. Unfortunately, we have no version of the FAA for program costing; therefore, as with a resort fee at a hotel, you need to ask about other costs.

At its core, the MDA is only supposed to procure systems, and after it is done fielding them, the intent is for the systems and all associated costs to be transferred to one of the military services. Therefore, MDA estimates tend to be limited to just the MDA’s costs—not lifetime costs. A February 2022 Government Accountability Office (GAO) report highlights this reality, noting that the U.S. Missile Defense Agency’s cost estimates included “a number of shortcomings...such as its comprehensiveness, accuracy, transparency, and traceability.”³

With regard to cost omissions, one needs to be aware that the MDA is omitting certain operational

and sustainment costs from its estimates. Why is this important? Because operations and sustainment costs can often reach 70 percent of lifetime-program costs, which means that omitting or adjusting these estimates has an enormous impact not just on current funding levels, but also on future funding levels. This has hampered the MDA because, in reality, the agency has not transferred many programs to the services. Therefore, over time, the MDA finds itself spending more funds on sustainment, which is not in its mission statement, and less on research and development and procurement, which are why it exists. This error, in effect, mortgages our future to pay for the present.

The GAO also notes that the MDA is inaccurately reporting flight test cost estimates. Two recent Terminal High Altitude Area Defense (THAAD) tests cost a combined \$20 million, but the flight test estimate was only \$2 million.⁴ This discrepancy is not isolated to the Army's THAAD system. The GAO also "found a \$1.5 billion increase in development costs for the Aegis Weapon System Spiral 5.1 program between 2019 and 2020 baseline reporting," while "MDA only reported a \$664 million increase—a difference of \$851 million."⁵ Why is this important? Because those costs are inaccurately represented elsewhere in the budget, which means that policymakers are using bad information when assessing the cost-benefit of one system versus another.

Is the MDA doing anything malicious? Not necessarily. For the most part, it is doing estimates only for those costs that apply directly to its mission set rather than after it transfers the program to the services. The MDA will also state that, regarding test costs, assessing fixed costs across programs may not be worth the effort. In any event, an observer's understanding of the costs for various MDA systems would be just over one-third of the actual cost: \$1.3 billion reported by the MDA versus "at least \$3.5 billion" uncovered by the GAO.⁶

However, just because it is not malicious doesn't mean it is not a problem. Anticipating ongoing systems costs certainly needs to be included in program estimates to help the decision-makers prepare for future years' defense spending.

Constellation-Class Frigate: The Guide to Wishful Thinking

Much like the MDA, the Navy has its own unique way of calculating costs. The Navy places all of its detailed design/nonrecurring engineering (DD/NRE)

costs in the procurement of the first ship for a specific class. Even taking that into account, it appears that the Navy then engages in a bit of wishful thinking on how costs can be reduced for the new class of ships, relying on intuition rather than on past data. This is analogous to someone who checks the price of an airplane ticket six weeks out and then uses that estimate to set aside funds for a ticket he intends to purchase the night before he flies.

In 2020, the Navy estimated that the *Constellation*-class frigate would cost about \$870 million per ship, or \$8.7 billion for the 10-ship project;⁷ Eric Labs, one of the top Congressional Budget Office (CBO) naval analysts, separately predicted that the program would cost \$1.2 billion per ship, or \$12.3 billion for the entire program.⁸ Historically, the Navy has "almost always" underestimated the cost of its shipbuilding projects.⁹ The Navy was able to weave together a wishful narrative that, according to the Congressional Research Service, could be true because the "FFG(X) is based on a [n Italian] design that has been in production [in Italy and France] for many years" and "[l]ittle if any new technology is being developed for it."¹⁰ So what actually happened?

From fiscal year (FY) 2021 to FY 2022, the Navy's estimate of the cost per ship increased by 14 percent. Specifically:

In the Navy's FY2021 budget submission, the FFG-62 class ship to be procured in FY2022 (i.e., the third ship in the program) had an estimated procurement cost of \$954.5 million. In the Navy's FY2022 budget submission, the ship has an estimated procurement cost of \$1,087.9 million—an increase of \$133.4 million, or 14.0%, over the figure in the Navy's FY2021 budget submission.¹¹

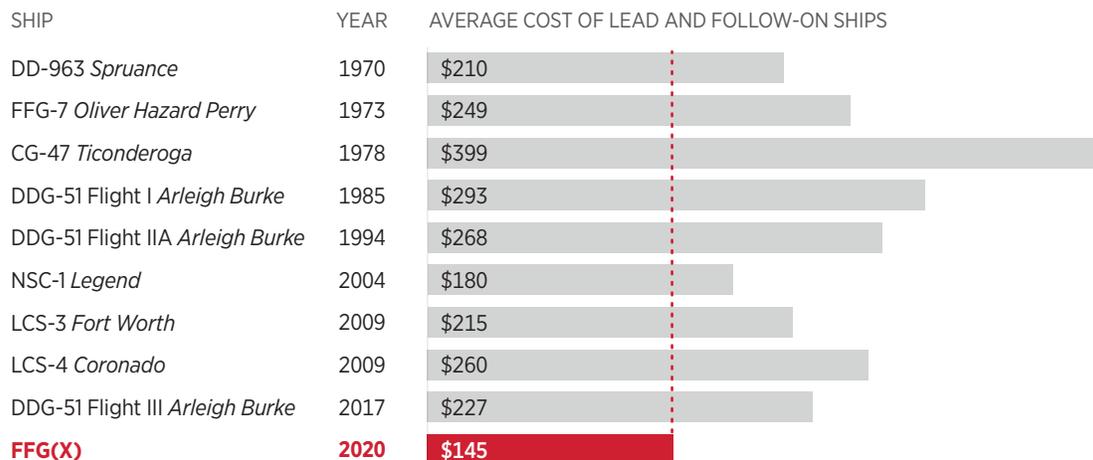
This increase came about as a result of preparation and testing costs that were not previously included in the estimates. Looking forward, "if FFG-62s were to wind up costing about the same to construct per thousand tons of displacement as other recent U.S. military surface combatants, then the third and subsequent FFG-62s could cost 17% to 56% more than the estimate for those ships shown in the Navy's FY2021 budget submission."¹²

The military services are not immune to wishful thinking, and they also know that getting the proverbial camel's nose under the tent is a certain way to

CHART 1

Pound for Pound: Comparing the Cost of the Navy's New Frigate

Every surface combatant built since 1970 cost more by weight to produce than the Navy expects its new FFG(X) to cost. Figures shown below are costs per thousand tons of displacement in millions of 2020 dollars.



SOURCE: Figure 1, “Cost of the Navy’s Surface Combatants per Thousand Tons of Lightship Displacement,” in Congressional Budget Office, “The Cost of the Navy’s New Frigate,” October 2020, p. 6, <https://www.cbo.gov/system/files/2020-10/56669-New-Frigate-Program.pdf> (accessed August 11, 2022).

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keep a program. Very few people get promoted for saying that they will run acquisition programs that cost more than previous programs; therefore, the inherent bias to “try for” savings is not malicious in intent but is instead rational inside a large bureaucracy. But that is not to say this rationale doesn’t desperately need a cleanup.

Littoral Combat Ships: Forgetting People and the Price of Having Them

The Navy is already decommissioning its initial purchase of the Littoral Combat Ship (LCS) fleet just 14 years after the first ship set sail and, amazingly enough, even as a ship is finishing construction. What went wrong? A lot. For the purpose of this analysis, however, we will confine ourselves to the cost projections for operating costs, which turned out to be outdated and inaccurate according to the GAO.¹³

The initial plan called for the ship to have about 40 people with maintenance done by contractors. The Navy estimated total operating costs per year per ship at \$50 million. In reality, the cost over time

was closer to \$71 million—a 42 percent miscalculation. While the difference between \$50 million and \$71 million might seem relatively small, if you account for a 42 percent mistake over a long period of time for a large fleet of ships, the cost increase gets very large, very fast.

How did the Navy get this so wrong? It turns out that outsourcing maintenance to contractors drove up the cost.¹⁴ The initial estimate of 40 crew members nearly doubled in reality to about 70, and before the Navy decided to terminate the program, the number of sailors needed was about to grow even more. Cost projections based on bad assumptions or preferred assumptions that turn out to be wrong introduce flawed data for programs; the result is policy decisions and budget commitments that prove to be terribly costly for the service and the taxpayer.

Optionally Manned Fighting Vehicle: Failing to Account for Uncertainty

One of the Army’s signature modernization programs is the Optionally Manned Fighting Vehicle

(OMFV). Being optionally manned means that it could operate autonomously, a task that has never been accomplished and for which there are almost no past cost data. To fund this program in the near term, the Army is slowing down procurement of its existing systems, in essence trading current combat power for future combat power.

However, will the Army be able to afford the new program, or is it doing as it did with the Future Combat Systems and other past efforts to build ground combat systems: setting itself up for having neither current nor future ground combat capabilities while spending tens of billions of dollars? If one is to believe the GAO, the Army is substituting the precision of point estimates to mask uncertainty, which in the past has led to failure “due to immature technology and changing and complex requirements at a cost to taxpayers of roughly \$23 billion.”¹⁵ In effect, reality displaces optimistic projections over time, revealing the true cost of systems that are consistently higher than originally presumed.

In the case of the OMFV, the consumer of the Army’s cost estimates needs to grapple with two important pieces of uncertainty. First, as discussed above, the Army has tried this before and failed to the tune of \$23 billion. One has to ask: Why is this time different? The second question is: If this has never been done before, as we have never built an optionally manned combat platform, how can the cost estimate even be accurate?

Given these complicating factors, it might have made more sense for the Army to structure this program as a series of smaller-duration, less risky demonstration projects that can prove out the cost, technology, and feasibility of the system. The GAO did give the Army high marks for following the cost estimation process, but at \$46 billion (the projected cost of the program), the uncertainty error is enormous.¹⁶ As we saw with the Navy LCS, there really may be no way to know what the actual cost will be.

The equivalent of this, for our airline ticket purchaser, is that you are going to buy an airline ticket for a flight 10 years from now and agree to pay based on the purchase price of aircraft that have yet to be purchased, the future unknown price of jet fuel, and the potential costs of developing the flight to have either a real pilot or no pilot at all. At this point, it is an open-ended commitment to spend money. Maybe this is less like buying a plane ticket than it is like buying a ticket to Mars.

Reserve Forces: The Cost of Active vs. Activating

In the past decade, both the U.S. Air Force and the U.S. Army have had financial disputes with their National Guard forces that have led to congressionally chartered commissions, both of which were triggered during periods of declining budgets and potential force structure reductions.¹⁷ The cost discussions are often difficult to understand, with both sides making “accurate” statements that lead to “different” conclusions. How can this be? It depends on how you blend personnel costs, equipment costs, and operating costs along with assumptions on Reserve use during peacetime for operational rotation missions versus wartime surge capacity. These five different variables can be, and often are, blended differently and then compared together as if they were the same.

The first and most frequently used costs are those for personnel. Since Reserve personnel are part-time personnel, it is a mathematical fact that those that are not activated are less expensive than full-time personnel. However, depending on how often and for what purpose the services activate their Reserve Component forces, they could cost more than the equivalent of an Active unit. This is due to the time—and therefore the resources—needed for mobilization and post-mobilization efforts. If used for the occasional surge operation, the costs of the Reserve over time tend to be less than those of their Active counterparts. But if used nearly continuously for operational missions (continuous boots on the ground), the costs tend to be higher.

Equipment costs, though often not discussed in relation to Reserve components, are relevant depending upon whether one treats equipment as a sunk cost because the equipment already exists or as a procurement cost that should be included in the Reserve’s total value/expense. The National Commission on the Future of the Army began over a dispute about the Apache helicopter’s force structure. Because the Army did not have enough Apaches and needed more funds to buy more aircraft, the price became a central component of the conversation.

When related to low-density, high-cost weapons platforms like the Apache, costs become more relevant because they can dwarf other investments like personnel or operations. To compare, the cost of 100 cargo trucks might be nearly negligible within the Army’s total budget for accounting purposes, but the

cost of additional Apache helicopters at \$13 million apiece mounts up significantly and quickly. (The less expensive trucks, however, also can add up to significant dollars if the quantity is high enough.) In other words, it matters what type of Reserve unit one is discussing, because the equipment within one type of unit can account for much more in dollar terms than the equipment in others does.

Emerging from all of these studies over many years are two fundamental premises when discussing the Active Component/Reserve Component force mix:

- “Part-time” force structure, meaning the capability delivered by traditional Reservists and Guardsmen who do not serve continuously on active duty, costs less than the force structure provided by “full-time” personnel.
- Reserve Component force structure, especially traditional Reservists, costs less than that of the Active Component, but Reserve Component forces are not always less expensive when conducting operations than are Active Component forces.

If you are trying to figure out how much it costs to travel from New York to Los Angeles, it matters whether you are flying on a private jet or a commercial jet, taking the train, or getting on a bus. For the discussion of Active versus Reserve Component costing, it matters whether you are including equipment costs, operational use, and wartime surge, broken out by various types of units.

The Cost of War: Who’s Asking?

According to the Special Inspector General for Afghanistan Reconstruction’s most recent report:

DOD’s latest *Cost of War Report*, dated September 30, 2021, said its cumulative obligations for Operation Enduring Freedom and Operation Freedom’s Sentinel in Afghanistan, including U.S. warfighting and DOD reconstruction programs, had reached \$849.7 billion.... State, USAID, and other civilian agencies report cumulative obligations of \$50.1 billion for Afghanistan reconstruction, which when added to the DOD amount results in \$136.9 billion obligated for Afghanistan reconstruction through that date....¹⁸

As of March 2021, the Department of Defense estimated that emergency/overseas contingency operations (OCO) spending for the wars in Iraq, Syria, and Afghanistan totaled \$1.596 trillion;¹⁹ as of June 2022, it estimated that the total had reached \$1.637 trillion.²⁰

The cost of a war is perhaps the most challenging of all cost estimates. There are, off the bat, many necessary clarifying questions such as:

- In what time span do you quantify the war?
- When do residual costs end?
- Do you count related but indirect war costs? For example, do you count related activities in Syria as part of the Iraq war’s costs?
- Does it include personnel costs, which have to be accounted for regardless of whether the servicemember is at home or abroad?
- Are you measuring what was spent that otherwise would have not been spent, or also the cost of assets and resources that would still have been costly without the war? For example, a plane is flown in peacetime if only for pilots to maintain their skills and certification.
- Is one to account for direct economic costs?
- What about costs associated with deaths, the climate, etc.?
- Do you know how you measure those?
- Do you count associated medical care for veterans of those wars?

Any estimate that professes to have determined the *actual* cost of war involves many subjective decisions about what to count and what not to count. Estimating the cost of the Iraq War is a chief example of this dilemma. The Brown University Costs of War Project has estimated that from FY 2001–FY 2022, the wars in Iraq and Syria cost a total of \$2.058 trillion (exclusive of future veterans’ care). If one includes future veterans’ care, total costs rise to \$3.158 trillion.²¹ A much less aggressive and comprehensive estimate by the Congressional Research Service puts

obligations for Iraq at 51 percent (\$759 billion) of total DOD OCO obligations from 9/11 through FY 2018.²² This would be the simplest number because it includes the fewest factors in estimated war costs.

This is very similar to trying to calculate externalities into the cost of a flight to differentiate it from the price you are actually paying. For example:

- What is the price of the carbon emissions from the flight?
- What about the cost of the taxpayer-subsidized airport?
- If the airline goes bankrupt, what pension costs will the government have to pay for in the future?
- What about the food stamp costs for the people cleaning the airplane because they do not make a living wage?
- Have we calculated the environmental damage caused by production of the jet fuel?
- While we are at it, how about the human cost of extracting the titanium needed in war-torn countries to build the aircraft?

All of a sudden, the “cost” of your flight diverges wildly from the “price” you pay for the ticket.

Such is the case with the cost of war. It encompasses not only weapons systems and personnel costs, but also the accounting difficulties within both. The question of what to count and what is being accounted for leads to incredible variance between cost estimates—whether based on projected interest or whether or not to include veterans’ care. The key here is transparency: By knowing how it is totaled, one can better assess the components of that total, whether and how it compares to others, and what capabilities the funds physically provide.

F-35: Most Expensive or Most Impressive?

The F-35 aircraft is one of the most advanced and ambitious programs that DOD has undertaken. It also is heralded as the most expensive program ever undertaken. As this is the last of the cases we will examine, it is interesting to see how the F-35 compares to some of the other programs discussed in this essay.

First, the cost is estimated over a 66-year life cycle, with a current estimate in excess of \$1.7 trillion.²³ (By contrast, the MDA did not estimate operational costs over the lifetime of the missiles and supporting systems it purchased.) Of the \$1.7 trillion, the procurement of 2,456 aircraft accounts for just under \$400 billion, while the cost of sustaining the planes over time hits nearly \$1.3 trillion. This is very important, as no other DOD program has a 66-year operating cost estimate.

Second, this program has updated its cost estimates more times than almost all other programs combined. Over the course of the program, the GAO alone has issued an extensive series of reports examining the F-35’s ongoing cost estimates and the “significant challenges DOD faced in sustaining a growing F-35 fleet.”²⁴ In April 2021, for example, the GAO reported that the Air Force needs to reduce estimated sustainment costs per plane by \$3.7 million by 2036 or face \$4.4 billion in costs beyond estimates.²⁵ Each time the GAO issues a report, the cost estimates are updated. For most programs, the cost estimates are traditionally frozen in time, so this is likely the first living cost estimate in DOD’s history.

Many worry that the armed services will be unable to afford the F-35’s sustainment. This should certainly be worrisome, as this critical project faces a grim future. But in relation to the thesis of this analysis, the forewarning and guidance on reducing future expenses make this program’s cost accounting also very impressive. As a result of expansive reporting from DOD and other U.S. government agencies on current costs and program updates and estimates, the F-35 program is likely the most well-accounted major weapons program in DOD history. One cannot help but wonder what the cost would be for every other major acquisition program across DOD if the same criteria and program updates that have been applied to the F-35 program were applied to them.

Finally, in comparing F-35 procurement costs with procurement costs for other aircraft, it is obvious that other systems do not have the same in-depth cost accounting. This makes an apples-to-apples comparison impossible for anyone but the most determined budget analyst.

In a recent and relevantly titled article, “Air Force’s Math on the F-15EX and F-35 Doesn’t Add Up,”²⁶ a comparison of the two fighter platforms reveals the impressive nature of F-35 program

cost counting. The Administration cuts the F-35 procurement quantities for FY 2023 because the F-15s are “less expensive to buy and to fly” than the F-35. The Air Force’s cost data for these two weapons systems prove this to be “patently false.” The F-35’s “flyaway” cost includes all of the equipment needed to meet mission requirements. The “cheaper” F-15 estimate provided by DOD fails to include offensive systems that are included in the F-35’s “sticker” price to meet the same requirements. And while the F-35 program might be a record due to its inclusion of all elements, for FY 2022, the gross weapons systems cost—including all necessary packages, equipment, and support depots—brings the F-15EX to \$120 million²⁷ compared to the fully loaded F-35A’s \$98.2 million.

Because of the F-35’s comprehensive cost estimates, the program has been able to see where changes need to be made. The fighter’s mission-capable rate has continued to rise in recent years, and DOD has reduced sustainment and readiness expenditures and timelines. Reform efforts include increasing the availability and production of spare parts, improving depot-level repair, and decreasing customer wait times.

Increased transparency may increase the apparent cost, but in the long term, it results in better decisions and informed savings. The same cannot be said with any certainty for other aircraft procurement programs because no other such program has been similarly assessed.

Conclusion

When you purchase an airline ticket these days, sites like Google Flights attempt to standardize the pricing by allowing you to adjust the ticket price for expenses like carry-on baggage and picking your seats while also measuring your carbon footprint. But even that tool is not necessarily sufficient because some airlines, such as Southwest, are simply

not on their search engine, while others use techniques like fare ghosting or providing discounted rates to other sites. In essence, *caveat emptor*—let the buyer beware. The same is true when you read a paper, news story, or official document about how much anything in DOD costs: Know that what you read is likely not everything you should know.

First, there is no consistent standard for the updating of lifetime budget costs, which is especially problematic when actual inflation rates vary heavily from those anticipated numbers. In these cases, the estimates become obsolete. Lifetime budgets are sometimes not updated when estimates for the procurement of individual units unexpectedly increase, as in the case of the FFG-62.

Next, the updated standards for budget estimation are not high enough, and there is no consumer protection board to hear complaints or to assess penalties for bad information. Even though services consistently underestimate initial and lifetime costs of personnel and weapons systems, there is no system for ensuring adjustments before the release of official estimates, which are almost always incomplete. Think of this as “in-flight meals not included” the next time you book your trip. The remedy for this is firmer definitions regarding budget estimations, something akin to the MSRP sticker on a new car—which in reality is often much more than the price you end up paying the dealer.

Perhaps most important, the consumers of this information should channel their inner “Sy Syms.” Sy ran a series of discount clothing stores in the Northeast, and his slogan was “An educated consumer is our best customer.” From reporters to analysts to the American public, asking the right questions, understanding partial answers—and when the answers are only partial—and then acting on the information will ensure that as a nation, we make better decisions and smarter investments regarding our national security.

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