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A woman in military uniform, wearing a headset and safety glasses, stands on a silver step ladder inside the fuselage of a large aircraft. She is looking upwards towards a large, complex engine component. The interior of the aircraft is metallic and shows various panels, rivets, and a circular air intake. The lighting is bright, highlighting the textures of the metal and the woman's uniform.

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Focus on U.S. Transportation Command

Project Convergence

2022 Essay Competition
Winners

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Cover 2 images (top to bottom): Seaman Domenica Scott stows away line on flight deck during sea and anchor detail as USS *Paul Ignatius* departs Naval Station Rota, Spain, after brief stop for fuel, August 3, 2022 (U.S. Navy/Aaron Lau); Boatswain's Mate Seaman Buckley Mitchell handles line on fantail as USS *Abraham Lincoln* moors at Naval Base Guam for port visit, March 2, 2022 (U.S. Navy/Aleksandr Freutel); Seaman Shawn Chirico heaves in line alongside fellow Sailors at fantail onboard aircraft carrier USS *Nimitz*, Pacific Ocean, May 17, 2022 (U.S. Navy/Caylen McCutcheon)



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Senior Airman Grace Tupper, crew chief with 172nd Maintenance Group, Jackson, Mississippi, inspects C-17 Globemaster III engine after aerial refueling training sortie at Air Station Barbers Point, Hawaii, July 12, 2022 (Air National Guard/Jared Bounds)

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The Surrender Monument, Vicksburg, Mississippi, 1900 (Detroit Publishing Company/Library of Congress)



Executive Summary

A local county in Virginia is reckoning with what to do to protect a monument to Confederate soldiers and sailors that was placed on public land by private organizations many years ago. This is setting up a drama that has already played out in the Commonwealth's capital, Richmond, with the very public removal of such monuments in the aftermath of George Floyd's death. The citizens of that county are concerned that someone might do harm to the monument.

Something that might not have been settled at Appomattox in 1865 seems to linger in the collective consciousness of the Nation. What seems hardest for some to deal with is what citizens of the same country owe to each other long after the

guns of the Civil War were silenced, long after the failed Reconstruction period ended with the rise of Jim Crow laws and a shifting of political party allegiances in the south and north of our country, even two generations after the Civil Rights legislation of the 1960s. Is the U.S. Civil War over? If not, can it ever be resolved in a way that unites the Union as Abraham Lincoln had hoped?

As I am reading Donald Miller's brilliant book *Vicksburg*, I am learning a great deal more of the actual social, political, and economic as well as military aspects of the war and this campaign that many historians believe was the one that truly broke the back of the Confederate states. What becomes clear, if one needed reminding, is that the

1862–1863 Vicksburg campaign was as close to total war as any experienced before or since in our country for the combatants and noncombatants alike. A key participant, Major General William Tecumseh Sherman, said that “war is hell.” He was not just remarking on the harsh conditions the soldiers on each side endured. The citizens of the Mississippi were among the first to experience the U.S. military instrument being used to destroy an economy, a way of life, based on a foundation of slavery. Positive views on slavery were not exclusive to the supporters of the Southern cause. Wars are rarely as simple as the division between two opposing sports teams and should not be treated as such, especially after the bullets stop flying.

But many of those who lost their way of life in the South eventually came to believe the myth of the “Lost Cause” as the “true” history of the war. I see the book *Lost Cause of the Confederacy* as like the thousands of social media efforts devoted to bending reality to one’s personal desires to gain something at the expense of another, creating a whole new virtual world of misinformation, myths, and “alternative facts,” each wielding its own caustic power in the minds of people. If we are unwilling to challenge historical myths with the best facts we can uncover and discuss, then the path forward as a society becomes unclear and potentially disastrous, as we have seen in the attack on the Capitol last year.

While some may seek to look only forward, I would offer that war—any war—leaves its mark on society and must be considered in everyday life, especially the unfinished work of the postwar period and any efforts to return to the prewar status quo. Today’s military and our recent veterans, with their experiences in Iraq and Afghanistan, know well what war and its aftermath look like. Our record is worth examining. Without doing so, the next war will likely rise out of the unintended coals of the past. I offer, as others have, that the current Russian invasion of Ukraine is based solely on the myths Putin believes are true. As a result, these myths become deadly both at an individual level as well as at a global one. To some, making war is easier than keeping the peace.

Our Forum offers two engaging articles that ask us to consider what might happen next in the world of conflict. First, while much has been said lately about the rise of flying machines without pilots on board, Jonathan Bell provides leaders and planners the issues and options to consider when countering the growing swarm of drones in the air. Next, a relatively new but important word, *lawfare*, or the use of the law as a weapon of war, is increasingly a part of Great Power competition, and Stephen Schiffman assesses the readiness of the joint force to respond.

The 16th annual Secretary of Defense and 41st annual Chairman of the Joint Chiefs of Staff (CJCS) Essay Competitions once again provided us

with three outstanding student compositions for your analysis. The competitions brought the 31 faculty judges some 97 essays to consider, and the submissions were considered by the “ancient” judges as some of the finest student writing in recent years. As this year’s final judging was in person for the first time in 3 years, NDU President Lieutenant General Michael Plehn, USAF, was on hand to welcome and thank the judges for their efforts.

The winner of the Secretary of Defense National Security Essay Competition, Jeffrey Graham of the National War College, writes about how building up the relationship of the United States with India is key to securing that theater. Winning the Strategic Research Paper category of the CJCS Strategic Essay Competition, Ryan Tate of the U.S. Army War College advocates for more transparency in the use of deterrence in the cyber domain. Taking first place honors in the Strategy Article category of the CJCS Essay Competition, Kimberly Sandberg, Kevin Pickard, Jr., Jay Zwirblis, and Speight Caroon, a student team from the Joint and Combined Warfighting School at the Joint Forces Staff College, make a compelling argument for the use of health diplomacy in the current strategic environment.

As the one military journal dedicated to the joint force, we are fortunate enough to highlight the work of the combatant commands. This issue’s Special Feature brings the latest from the U.S. Transportation Command (USTRANSCOM). For a view from the top of the command, my interview with General Jacqueline Van Ovost should help readers see the global scope and reach of USTRANSCOM in supporting national command authorities, the regional commands, as well as our allies and partners. Each of the command’s components and the staff offer their takes on how USTRANSCOM operates, starting with the Air Force’s Air Mobility Command’s Michael Minihan, who discusses airpower and its contribution to joint victory. David Bassett and James Regan describe the work of the Navy’s Military Sealift Command who work the

heavy lifting for the joint force. Bruce Busler, who directs USTRANSCOM’s Joint Distribution Process Analysis Center, describes how the command has adapted to meet the demands of changing national defense strategies since the end of the Cold War. Completing the team discussion, Fred Teeter gives insight into how the Army’s Surface Deployment and Distribution Command provides sustainment to the joint force. I want to thank General Van Ovost and her team for sharing their insights into this best of teams.

Features has three diverse and valuable articles that cover emerging areas of interest to the joint force. A constant concern for commanders and their units in any conflict, recent efforts to achieve Joint All-Domain Command and Control through experimentation are highlighted by James Richardson, as he details the Army’s efforts in Project Convergence. Food competition is often at the root of conflict, especially among the fishing fleets of the world, as Scott Apling, Martin Jeffery Bryant, James Garrison, and Oyunchimeg Young help us understand the issues involved when these activities violate international law. As longtime readers of *JFQ* will know, medical issues related to operations and strategy are found in these pages, and George Barbee offers a look into the future of military medicine and its impact on our planning and execution of the joint fight.

Rounding out this edition, Dagvin Anderson, Philip Buswell, and Andrew Caulk give us an outstanding Recall article that discusses their information versus kinetic operations as a part of their campaign experiences in Somalia. We also help you find the best books to read with three valuable reviews.

With this 107th edition of the Chairman’s journal, we invite you to comment on war, peace, and the in-between, as that is where you will always find the joint force. *JFQ*

—William T. Eliason,
Editor in Chief



Drones sit in takeoff position before drone swarm demonstration during NATO's Counter-Unmanned Aircraft Systems Technical Interoperability Exercise in Vredepeel, Netherlands, on November 10, 2021 (Courtesy NATOChannel)

Countering Swarms

Strategic Considerations and Opportunities in Drone Warfare

By Jonathan B. Bell

One of our most important duties as professionals is to think clearly about the problem of future armed conflict.

—GENERAL DAVID PERKINS¹

The Department of Defense (DOD) and the U.S. Government face a significant national security

Colonel Jonathan B. Bell, USA, is Director of Operations and Training (J3) for Joint Region Mariana, Guam.

challenge in adversarial use of small unmanned aircraft systems (sUAS). The available technology to create swarms of these capabilities results in multilayered and unmanageable threats. This article addresses ways to prepare for and respond to this looming challenge,

colloquially known as “drone swarms.” Driving this concern are underlying questions that challenge conventional thinking and practice. Some of the unanswered issues include the potential capability of sUAS swarms against U.S. interests and the reciprocal response.

No approach to date has adequately addressed America's potential responses to the strategic risk of drone swarms. Although DOD strategy includes some ways to counter the threat of enemy drones, it does not fully confront the challenges that it must solve the strategic problem posed by future armed drone swarms.² To mitigate this emerging risk, the United States requires a coordinated approach to tackling the technical, legal, and doctrinal issues.

Strategic Links

Current U.S. strategy documents provide overarching requirements for securing and advancing national interests. However, the emerging threats and underlying drone swarm technology threaten U.S. posture. For example, the 2017 National Security Strategy states, "We will maintain a forward military presence capable of deterring and, if necessary, defeating any adversary."³ With the extensive commitment of U.S. military forces worldwide, adversaries could employ drone swarms to challenge U.S. interests in many areas; if so, the U.S. military could not credibly project power to deter and defeat these same adversaries.

Additionally, the National Defense Strategy acknowledges the changing character of warfare, with actors more rapidly and easily accessing technology, including artificial intelligence (AI), autonomy, and robotics.⁴ Then-Secretary of Defense James Mattis illustrated the concern domestically in 2018 by acknowledging that the homeland is no longer a sanctuary and that we must anticipate attacks against "our critical defense, government, and economic infrastructure."⁵ Drone swarms pose a significant national security strategic risk, and countering this emerging threat presents the United States with challenges and opportunities in three key areas: technology, law, and doctrine.

Setting the Stage: Emerging Trends

The literature on adversarial sUAS employment reveals the potential for innovative ways to change the character

of warfare. The technological revolution enables actors to employ drones to achieve national objectives. The recent war over the contested region of Nagorno-Karabakh in the South Caucasus region illustrates this reality. Azerbaijan's employment of sUAS significantly aided its victory by supporting its air and ground campaign against Armenia, which had more conventional air and ground forces, including fighter aircraft and tanks.⁶ Moreover, the war illustrated the advantage of using sUAS to destroy air defense systems, ground forces, and armored vehicles with relatively inexpensive air capabilities.⁷ The systems can avoid enemy air defense systems by virtue of their relatively small sizes and slower speeds, and they offer less prosperous states potential military advantages in conventional conflicts.⁸ This rebalance of power suggests that states may employ sUAS in future conflicts more often to coerce their enemies, enable diplomatic concessions, and achieve national security objectives. Remotely piloted aircraft are instruments that have changed the character of warfare, and innovative uses of small drones illustrate the evolutionary next step, with a low cost and a high reward potential.

Beyond the current application of sUAS, future development of these air vehicle trends toward greater sophistication, with advances in *AI*, *autonomy*, and *machine learning*. These terms may cause some to think of fictional works, such as *Angel Has Fallen* (2019), a movie in which small propeller-driven drones launch from ground-based tubes to attack the U.S. President and his Secret Service detail.⁹ However, major military powers currently pursue this capability.

The China Academy of Electronics and Information Technology tested the launch and employment of multiple sUAS in swarm formations from both ground-based and airborne launchers in September 2020.¹⁰ Additionally, the U.S. Navy's Office of Naval Research and the Defense Advanced Research Projects Agency have conducted extensive testing in recent years, using large numbers of drones in coordination with each other to perform reconnaissance,

fly in formation, or potentially drop munitions on targets.¹¹ A September 2020 exercise revealed that Russia also continues to pursue integrated teaming with three models of sUAS to strike ground targets.¹² Although that is not drone swarming per se, a Russia expert notes, "At this point there is lots of research in Russia on the UAV [unmanned aerial vehicle] swarm use, and there is testing and evaluation of such concepts."¹³

Civilian development of drone swarms shows that this is a dual-use technology. Demand for drone capabilities has increased over the past few years, as companies have programmed hundreds and sometimes thousands of sUAS for choreographed displays. For example, Intel set the world record for the largest number of drones in one display, with 2,066 in 2018. Intel's specific model of drones flew in numerous events, including the 2018 Winter Olympics and the halftime show at the 2017 Super Bowl.¹⁴ Recently, a drone show displayed swarm-like capabilities for President-Elect Joe Biden's Delaware victory celebration.¹⁵ A nefarious actor might conceivably seize control of these existing masses of drones and wreak havoc on events involving heads of state or large crowds. Iran demonstrated unusual sophistication with a drone attack against one of Saudi Arabia's largest crude oil stabilization plants in September 2019 and is also experimenting with employing masses of drones against 50 targets simultaneously.¹⁶ These trends in both military and civilian applications of drone swarms portend a future in which U.S. power can be challenged. Although actors have not yet employed true small drone swarms against adversaries, such an application of the technology may not be far off.¹⁷

Strategic Risks and Implications

States should plan to employ drone swarms after careful consideration of their risks and implications. Some literature acknowledges the conceptual application of drone swarms in certain strategic military contexts. For example, one strategy expert theorizes that armed fully autonomous drone swarms (AFADS), a subset of drone

swarms, could be considered a weapon of mass destruction (WMD).¹⁸ A U.S. Army wargame applied methodology to demonstrate how drone swarm weapons might provide operational advantages in parallel attack.¹⁹ One of the originators of the DOD directives on the employment of autonomous systems states:

Deploying fully autonomous weapons would be a weighty risk, but it might be one that militaries decide is worth taking. Doing so would be entering uncharted waters. . . . Hostile actors are actively trying to undermine safe operations [in wartime]. And no humans would be present at the time of operation to intervene or correct problems.²⁰

China may be willing to assume this risk; it is developing autonomous weapons capable of making decisions independent of a human operator. Former Secretary of Defense Mark Esper noted this distinction between U.S. and Chinese approaches to autonomous weapons development.²¹ Several commentators have asserted that AFADS offer military advantages, including the freedom to strike traditional air defenses covering strategic assets or to conduct surveillance against nuclear and supporting capabilities.²²

States must consider the strategic implications of autonomous weapons programs. An actor's employment of a drone swarm against an adversary could result in an unintended escalation, and an unexpected AI decision could inadvertently result in an enemy's counterattack or a diplomatic crisis. International discussions have not addressed the strategic considerations in terms of "crisis stability, escalation control, and war termination" with the use of fully autonomous weapons.²³ Many experts agree that autonomous weapons systems may provide operational advantages during crises or armed conflicts, particularly in gray zone or hybrid warfare, but the strategic risks require policymakers to consider these dangers now to avert catastrophic results later. Fully autonomous weapons systems increase the risk of miscalculation and/or misinterpretation, which may result in uncontrolled escalation among both state and nonstate competitors. This includes an increased

threat of the use of WMDs.²⁴ Despite the inherent risks and consequences of employing autonomous drone swarms, these capabilities present actors with military and strategic options to achieve national objectives. Partial autonomous drone swarm weapons with a human in the loop could present risks, albeit to a lesser degree, to adversaries as well.

Important Terms

Key terms and the scope of analysis will clarify misconceptions. Irving Lachow, writing in the *Bulletin of the Atomic Scientists*, defines *swarming drones* as "distributed collaborative systems . . . flocks of small unmanned aerial vehicles that can move and act as a group with only limited human intervention."²⁵ Another definition of swarming specifies the military application: "large numbers of dispersed individuals or small groups coordinating together and fighting as a coherent whole."²⁶ According to DOD Directive 3000.09, autonomous weapons systems, "once activated, can select and engage targets without further intervention by a human operator."²⁷ The National Academies of Sciences, Engineering, and Medicine specify drone swarms as 40 or more sUAS where the group acts as a unit with individual behaviors, all members do not know the mission, members communicate with one other, and each sUAS "will position itself relative to other sUAS."²⁸ These innovations include applications of AI, autonomy, and machine learning, along with advancements in sUAS, designated by DOD as groups 1, 2, and 3, that behave as a whole for missions including intelligence, surveillance, and reconnaissance and offensive attacks.²⁹ This threat will be referred to as drone swarms for the rest of this article.

Technical Feasibility

Countering drone swarms involves three areas of both challenge and opportunity for DOD and national agencies tasked to defend the homeland. For the first, technology, DOD's efforts focus on material solutions. In fiscal year (FY) 2021, DOD initially planned "to spend

at least \$404 million on counter-UAS (C-UAS) research and development and at least \$83 million on C-UAS procurement."³⁰ All military Services pursue a variety of cutting-edge technology solutions to detect, track, identify, and defeat targets. Material solutions for detection include radar as well as electro-optical, infrared, and acoustic sensors; all are limited in their effectiveness by the surface area characteristics and relative speeds of small drones.³¹ Another technique involves the detection of radio command signals that an operator might require to control the drone.³² Defeat mechanisms include methods such as jamming, spoofing, guns, nets, directed energy, and standard air defense systems.³³ However, current capabilities present operators with mixed results and primarily target smaller numbers of drones that do not exhibit swarm behaviors.³⁴ Other methods, including high-powered microwaves (HPM), which the U.S. Air Force and DOD are testing in operational settings, may offer more effective capabilities against drone swarms, but proprietary challenges could limit their effectiveness.³⁵ Admittedly, DOD may be pursuing more advanced HPM weapons with smaller infrastructure footprints, such as the Leonidas system, but the present research is limited to unclassified sources.³⁶

The DOD counter-sUAS (C-sUAS) strategy rightly acknowledges the changing character of warfare that drone swarms present but does not specifically address the technology risk.³⁷ Significant limitations of the current technology considering the near-future requirement to counter drone swarms present a challenge to the industry. Moreover, DOD may not be focused on the emerging threats of drone swarms. Rather, development and acquisition efforts indicate an emphasis on sensors and weapons to defeat current sUAS. The DOD FY 2021 budget for C-UAS is an indicator of the near-term financial costs of developing current equipment and may not account for technology innovation required to meet the future demand. If so, this approach may prove inefficient and cause significant risk

in an environment of declining budgets for DOD during and after the COVID-19 pandemic. The speed at which states are developing drone swarm technology indicates a more rapid rate of maturation than that of the equipment to counter such threats.

Observers note the need for rapid innovation to mitigate rising threats, but the current defense industrial base faces barriers to change, including military culture and new commercial technology testing.³⁸ One of the more common problems with rapid innovation originates in the acquisition of commercial products, in which intellectual property becomes an impediment to system employment. This

problem becomes acute when companies' equipment or software cannot necessarily interoperate, leaving the C-sUAS operator without the fused, timely, and useful information necessary to defeat a target.³⁹ Military culture does not necessarily reward innovative thinkers and can be a barrier to rapid change. Although DOD's current C-sUAS strategy identifies the threat of drone swarms, it does not adequately address how DOD must overcome the technology risks of high cost and sluggish innovation to counter them.

Lawful Acceptability

The second source of risk from the C-sUAS strategy originates in the seams

found in the patchwork of legal constraints, particularly in the homeland.⁴⁰ The protections that current laws afford U.S. citizens in the homeland also inhibit DOD in its protective capabilities on military installations from drone threats. Drone swarms exacerbate the risk such constraints create, given the multiplying effects of their threat capabilities and the restrictions on detecting them. The C-sUAS strategy rightly asserts that key DOD stakeholders must collaborate with partners for success.⁴¹ This imperative should drive legislative solutions to broaden authorities in the domestic environment in which this counter-drone equipment operates.



Staff Sergeant Noah Straman, assigned to Headquarters and Headquarters Company, 37th Infantry Brigade Combat Team, fires DroneDefender during Operation Northern Strike, at Camp Grayling, Michigan, August 14, 2022 (U.S. Army/Benhur Ayettey)



Marine Corps Corporal Chance Bellas, combat engineer with Littoral Engineer Reconnaissance Team, 9th Engineer Support Battalion, 3rd Marine Logistics Group, assembles small unmanned aircraft system VAPOR 55 during Balikatan 22, at Claveria, Philippines, March 30, 2022 (U.S. Marine Corps/Melanye Martinez)

The C-sUAS strategy correctly highlights the significant legal challenges of operating counter-drone capabilities in the homeland, asserting, “Many existing laws and federal regulations were not designed to address sUAS as threats, and the continued rate of technological change makes it difficult for the legal authorities to keep pace.”⁴² Current law does not allow for timely detection of potential drone threats, which may originate from outside a military installation. The Secretary of Defense and Armed Forces designees are authorized by 10 U.S. Code (USC) section 130i to take all kinetic or nonkinetic actions to “disable, damage, or destroy” an unmanned aircraft system that poses a threat to a “covered facility or asset.”⁴³ This legal limitation prevents an operator from defeating a potential drone threat before it reaches the target.

Although 10 USC 130i authorizes DOD to “detect, identify, monitor, and track unmanned aircraft, without prior consent . . . by means of intercept or other access of a wire, oral, or electronic communication,” it does not specify whether this authority extends beyond a base’s boundary; if it did, it would provide a tactical advantage for the defender.⁴⁴ The new authorities are unclear also about whether DOD can collect the required information about drones outside its jurisdiction without violating intelligence oversight directives. Moreover, collecting such information against a potential drone swarm threat might amplify the liability. Detecting targets also requires distinguishing between hostile and friendly drones, and processing specific information related to legitimate civilian aircraft could be problematic given current authorities.

In accord with the C-sUAS strategy, DOD must act multilaterally and share threat information with law enforcement agencies, as permitted by 10 USC 130i.⁴⁵ One way in which this may be possible is during national security special events (NSSEs), when the Federal Bureau of Investigation (FBI) could have the temporary authority to counter drones without first obtaining warrants. The Preventing Emerging Threats Act of 2018 authorized both the Department of Homeland Security (DHS) and the Department of Justice (DOJ) “to mitigate the threat that unmanned aircraft . . . poses to the safety or security of facilities or assets, through a risk-based assessment.”⁴⁶ In recent cases, the FBI worked with the Federal Aviation Administration (FAA) and successfully countered over 200 drones during FY 2020 at events including the 2020 Super

Bowl, the 2019 World Series, the 2020 Rose Bowl Game, Washington, DC's "A Capitol Fourth," and New York City's New Year's celebration.⁴⁷ The FBI also worked with DHS and state and local law enforcement in Georgia to confront 54 drone incursions during the 2019 Super Bowl; at least six were confiscated during the temporary flight restriction around the stadium.⁴⁸

The language of the Preventing Emerging Threats Act of 2018 text closely resembles the authorities in 10 USC 130i, but it remains unclear how DHS, DOJ, and DOD could work together practically. First, the NSSEs are temporary, and the advantage of early warning of threats through coordination between the agencies would almost be negligible without permanent authorities. An adversary would likely not launch a drone swarm attack against DOD assets during a NSSE. Second, if DOD identified a threat outside its jurisdiction and warned DHS or DOJ, it is unlikely Federal, state, or local law enforcement would have the time and capabilities to interdict a drone swarm threat.

Local law enforcement and private entities have even fewer authorities to counter drones. According to a recent advisory from DHS, DOJ, the Department of Transportation, and the Federal Communications Commission, non-Federal public agencies and private persons who employ counter-drone technology could violate Federal laws. The law defines drones as aircraft, and any instrument to disrupt or destroy a drone could trigger liability involving the Aircraft Sabotage Act and the Aircraft Piracy Act.⁴⁹ Those who use radio frequency detection may be liable to lawsuits involving the Pen/Trap Statute (18 USC §§ 3121–3127) and the Wiretap Act (Title III, 18 USC §§ 2510 *et seq.*) depending on whether the capability records or intercepts electronic communications between the drone and controller.⁵⁰

Finally, the collateral effects may cause local law enforcement or private entities to reconsider employing these capabilities. Jason Knight advanced an analysis of considerations for police agencies in urban areas and references examples

in which counter-drone technology interferes with legitimate ground and air activities.⁵¹ Current authorities do not provide the comprehensive legal foundation for the early warning capabilities that DOD requires to counter a drone swarm. Although multilateral coordination may provide defenders an advantage in certain situations with host nations or in contingency locations, the homeland provides adversaries with advantages in potential attempts to employ a drone swarm against critical infrastructure, given DOD's legal limitations.

Doctrinal Suitability

The final impediment to the C-sUAS strategy stems from an important but overlooked facet about effective employment of counter-drone equipment. The strategy correctly asserts the need for doctrine to be developed as technology matures, but simply acknowledging enterprise needs does not address the significant challenge of planning for *who* might operate the equipment.⁵² Identifying doctrinal needs now will mitigate capability gaps in the future. The U.S. Army must assume a greater role in defending air bases from the drone swarm threats of the future.

One of the unique aspects of employing counter-drone capabilities is that it includes operating in all domains. Specifically, the immense challenge of targeting and mitigating adversaries in the air requires a clear-eyed assessment of division of labor among the three primary mission areas: air defense, force protection, and airspace control. Extracting principles of employment from these mission areas should be valuable for planning strategic uses of counter-drone capabilities. Joint doctrine is based on current force structures and responsibilities for helping solve complex problems.⁵³ Planning for ways to counter drone swarms requires a deeper assessment of the roles and responsibilities in joint doctrine.

Doctrine must account for training the operators of future equipment that will function in all domains. Operating in the air domain requires personnel who are fully knowledgeable and proficient in air defense, force protection, and airspace

control. Designing and resourcing a force structure that evolves in tandem with technology and equipment will more efficiently deter and counter advanced threats. This development will then drive authoritative guidance for counter-drone-swarm doctrine and is part of the Joint C-sUAS Office (JCO)'s responsibility as DOD's executive agent.⁵⁴ Additionally, the JCO will "coordinate development of joint operational concepts and joint doctrine for C-sUAS" and leave to the individual Services responsibilities in the other domains.⁵⁵ However, this description of responsibilities fails to account for the current challenges of roles among DOD's Service departments in airspace control, force protection, and air defense against the drone swarm threat. A force protection military professional focused on countering ground threats does not have the requisite knowledge to counter air threats while avoiding friendly aircraft. Training these personnel in the relevant characteristics of the airspace environment, electromagnetic spectrum, space operations, and weather will yield more effective employment of capabilities against drone swarms. Overlapping shared responsibilities in air defense, particularly between the U.S. Army and U.S. Air Force, can solve this doctrinal challenge. However, the Services have relied on force protection specialists instead—which presents risks to the enterprise.

Doctrinal discussions also include debates on roles and missions, especially in the air defense of air bases. The wars in Vietnam and Iraq forced senior military commanders and the Services to allocate capabilities to traditional missions at the expense of defense of air bases supporting strategic and operational objectives.⁵⁶ The Army and Air Force especially have wrestled over specific roles in area and point air defense missions since the end of World War II. A 2020 RAND study highlighted the current debate:

Today, the U.S. Army is responsible for providing point AMD [air and missile defense] for Air Force bases and other fixed facilities, but years of neglect from both services have resulted in capability and capacity shortfalls. . . . Army leadership has

*understandably prioritized mobile short-range air defense for its maneuver units over fixed facility defenses.*⁵⁷

Until the Army adequately prioritizes resources for the air defense of main operating air bases both at overseas locations and in the homeland, strategic and operational objectives are susceptible to increased risk of exploitation by drone swarms. Additionally, the Air Force will likely continue to advocate and acquire C-sUAS capabilities absent doctrinal resolution. The Air Force may achieve its longstanding desire to assume a greater lead in tactical air defense—which would contradict the JCO’s mandate to avoid duplication of effort and gain efficiency.⁵⁸ Similarly, the other Services will likely continue acquiring equipment and experimenting, which may not be optimal or effective without cross-domain and functional coordination.

The RAND report also details the misalignment of Army and Air Force roles in air defense. Of note, the table fails to show that commander, Navy Installations Command, employs master-at-arms personnel for shore-based C-sUAS capabilities, indicating misalignment of force structure and prioritization compared with air defense when afloat. A 2020 congressional research report poses an important question in the context of this debate: “Are planned SHORAD [short-range air defense] force structure and capabilities adequate to meet predicted future challenges?”⁵⁹ The report suggests that the Army’s plans for 18 more battalions of air defense capabilities divided between Active and Reserve

components may be inadequate for the needs of Army forces supporting both the European Deterrence Initiative and the Pacific Deterrence Initiative.⁶⁰ These capabilities include countering the sUAS threat but do not include the assumed mandate to defend critical Air Force assets and main operating bases. Although Joint Publication 3-0, *Operations*, calls for integrating offensive and defensive capabilities to achieve air superiority and force protection against enemy unmanned aircraft, it does not specify roles and missions to the Services.⁶¹ This doctrinal ambiguity increases the danger of under-resourcing the SHORAD enterprise to counter the multiplying effects of future drone swarms.

The emerging development of technology and increased likelihood of actors employing drone swarms necessitates a reevaluation of doctrine and Service roles. In fact, the Air Force Chief of Staff has urged the Office of the Secretary of Defense to direct a review of roles and missions among the Services to determine lead organizations for joint warfighting concepts such as long-range precision fires and logistics under attack.⁶² Both of these concepts are relevant to the protection of strategic assets from potential drone swarm attacks. Furthermore, DOD’s lack of doctrinal guidance may also indicate a need to assess interagency concepts and methods to employ similar capabilities in civilian jurisdictions. The JCO and its DOD strategy will provide essential elements for continued doctrinal development, but more work must focus on aligning Services’ roles and resources.

Recommendations

A new DOD approach to counter drone swarms must address the risks of rapid technology development, the legal seams adversaries could exploit between civilian and DOD protection of critical infrastructure, and the doctrinal challenges inherent in air defense, airspace control, and force protection. As the 2018 National Defense Strategy noted, the homeland is no longer a sanctuary and remains a target from enemy drone swarms, potentially with intercontinental range capabilities.⁶³

Adversarial trends must drive the defense industrial base to relatively low-cost, rapid, and AI-enabled technical solutions. The Third Offset Strategy, which originally sought to incorporate future technologies, offers a particularly useful approach for mitigating this risk. This strategy explored ways in which swarming drones, hypersonic weapons, AI, and human-machine teaming could best combine to offer distinct advantages in combat, but it did not solely focus on material and equipment.⁶⁴ Rather, it considered how best to integrate human creativity with technological precision. When applied to countering drone swarms, human-machine teaming concepts can provide an advantage in the air defense enterprise. A solution should include a range of sensors fully integrated with AI software to identify potential targets more rapidly and with a greater confidence level. U.S. Army TRADOC Pamphlet 525-3-1, *The U.S. Army in Multi-Domain Operations 2028*, identifies these characteristics as desirable for AI and high-speed data processing

Table. Examples of Well-Aligned and Not Well-Aligned Service Responsibilities for Air Defense

	Example 1: Fleet Air Defense Afloat		Example 2: Ground-Based Air Defense of Air Force Bases	
	Navy	Marine Corps	Army	Air Force
Service assigned responsibility?	Yes	Shared with Navy when afloat	Yes	No
Service with greatest stakes?	Yes	Shared with Navy when afloat	No	Yes
Service priority?	Yes	No	No	Growing
Dedicated force structure?	Yes	When afloat	No	No
	Well-aligned		Not well-aligned	

Source: Alan J. Vick et al., *Air Base Defense: Rethinking Army and Air Force Roles and Functions* (Santa Monica, CA: RAND, 2020), 99, available at <<https://doi.org/10.7249/rr4368>>.



Marine Corps Lance Corporal Dmitri Shepherd launches drone while conducting infantry platoon battle course during Bougainville II, Pohakuloa Training Area, Hawaii, October 14, 2021 (U.S. Marine Corps/Brandon Aultman)

to improve “human decision making in both speed and accuracy.”⁶⁵

Worthy investments in this human-machine technology could include AI-enabled autonomous swarm drones to mitigate or destroy enemy swarms through dogfighting. Georgia Tech University conducted this kind of experiment in collaboration with the Naval Postgraduate School in 2017.⁶⁶ Additionally, DOD’s low-cost-per-shot developmental capabilities include nonkinetic, direct energy weapons such as the tactical high-power microwave operational responder (THOR) and hybrid defense of restricted airspace (HyDRA) programs.⁶⁷ THOR presents a particularly effective capability to counter drone swarms because of its larger cone of influence compared with a HyDRA laser. However, when deployed in tandem and coordinated with an integrated command

and control (C2) interface that teams AI with a human in the loop, the system could prove more effective at a lower cost than standard air defense capabilities.

C2 capabilities must enable faster targeting, connect sensors to defeat mechanisms, and allow the human operator to select more effective weapons rapidly. Recent reporting suggests the JCO is pursuing these capabilities and may require each of the Services to develop its own C2 systems for eventual integration into the U.S. Army’s Forward Area Air Defense Command and Control system.⁶⁸ Other C2 systems include the U.S. Navy’s CORIAN (Counter-Remote Control Model Aircraft Integrated Air Defense Network) capability and the U.S. Air Force’s Multi-Environmental Domain Unmanned Systems Application Command and Control.⁶⁹ However, these specific systems do not appear to tie in to

the Advanced Battle Management System or proposed Joint All-Domain Command and Control (JADC2) architecture at this time. Recent and nascent efforts demonstrate an initiative to tie sensors to shooters to counter drone swarms using the JADC2 concept in the North Atlantic Treaty Organization.⁷⁰ The future JADC2 architecture could conceptually enable a human operator to take command of an enemy drone swarm network for his or her own purpose.⁷¹ Regardless of the innovation, the Third Offset Strategy offers a potentially valuable approach to the problem of countering future lethal autonomous drone swarms.

Pursuing disparate and Service-specific C2 capabilities without considering the future drone swarm threat or AI development activities would waste time and taxpayer funds. Instead, DOD should integrate the



Naval Aircrewman (Helicopter) 2nd Class Daniel Ayres, assigned to Helicopter Sea Combat Squadron 21, fires GAU-21 .50 caliber machine gun in MH-60S Seahawk at target drone during live-fire exercise with amphibious assault ship USS Essex, Pacific Ocean, April 18, 2021 (U.S. Navy/Sang Kim)

counter-drone-swarm C2 capabilities that it has already developed for FY 2021 into the JADC2 architecture more quickly.⁷² Congress tasked the Secretary of Defense to assess integrated air and missile defense C2 systems, which include C-UAS capabilities, and to determine whether they are compatible with the emerging JADC2 architecture.⁷³ This framework meets the congressional preference for autonomous or semiautonomous capabilities with low operating and sustainment costs.⁷⁴ Although interoperability, intellectual property, data management, and information assurance remain challenges, integrating C-sUAS C2 systems into the JADC2 architecture will yield faster kill chains and potentially less costly programs. JCO director Major General Sean Gainey recently acknowledged this open architecture approach as one that might pay significant security dividends later.⁷⁵

Second, working within the existing legal framework in the homeland, DOD

must advocate for more authorities at fixed sites to defend critical infrastructure. Congress must grant increased powers to the Secretary of Defense both during contingencies and in peacetime. The proposal must include the authority for operators to identify potential targets outside a base's boundary. An operator should also have the legal support to warn local and Federal law enforcement agencies in near real time.

Fortunately, the FAA is pursuing several initiatives to counter enemy drones. These plans include incorporating drones into the national airspace system to distinguish between friendly and enemy drones.⁷⁶ DOD should actively encourage both the FAA and the National Aeronautics and Space Administration to continue their respective drone industry initiatives, including the Unmanned Aircraft System Traffic Management study, in order to "identify services, roles and responsibilities, information

architecture, data exchange protocols, software functions, infrastructure, and performance requirements for enabling the management of low-altitude uncontrolled drone operations."⁷⁷ These increased authorities, combined with enhanced capabilities, could close the legal gap between civilian and military jurisdictions to protect both national infrastructure and critical DOD assets.

Finally, DOD must aggressively hone doctrine through wargaming and exercises to determine the most appropriate roles and functions in the air base air defense enterprise. As drone technology matures and presents friendly forces with more complex problems, establishing the right force structure early will more effectively meet the challenge. This will allow the required training and appropriate resourcing to meet congressional demand for effective and low-cost equipment. As the RAND study noted, no single course of action but, rather, a combination provides

the solution. A realignment of roles and functions, however, is essential to success.⁷⁸ The pursuit of appropriate joint doctrine will provide the foundation for a strong and risk-based model to counter drone swarms in the future and avoid the strategic mistakes of the past. JFQ

Notes

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President Volodymyr Zelensky reviews military plans during working trip to Dnipropetrovsk region, July 8, 2022, to counter Russia's invasion and crimes against Ukrainian state (President of Ukraine)

Great Power Use of Lawfare

Is the Joint Force Prepared?

By Stephen R. Schiffman

The joint force is in a period of introspection, realizing, after 2 decades of counterinsurgency operations, that it has lost its monopoly on power. When military professionals and scholars discuss the ways the character of war has changed, they focus most on the blurring of traditional elements of conflict—that is, the gray

zone.¹ U.S. adversaries have become increasingly adept over the past quarter-century at achieving their goals in a manner that is deliberately designed to remain below the threshold of conventional military conflict and open interstate war. One such method, the use of lawfare, involves using law as a weapon to achieve a particular objective. The application of law as a means and method of war is not new. However, in today's era of Great Power competition, Russia and China expertly combine lawfare with information operations,

while the U.S. Government, possessing substantial capacity, has no overarching lawfare strategy. This article serves as a primer on the topic of lawfare, discusses its use by Russia, China, and the United States, and finally, reviews ways in which senior leaders must respond with changes to the organization of legal capabilities.

History of Lawfare

Lawfare, although a relatively new term, has always been particularly well-suited to competition below the threshold of

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Aerial photo taken from Philippine military plane shows alleged ongoing land reclamation by China on Mischief Reef in Spratly Islands, South China Sea, west of Palawan, Philippines, May 11, 2015 (Reuters/Ritchie B. Tongo)

conventional military conflict. Indeed, the use of law as a weapon of war arguably goes back to the early 1600s, when Hugo Grotius, the so-called father of modern international law, promoted the idea of the freedom of the seas.² He thereby secured seafaring trade routes for the Dutch East India Company, an objective that Dutch military power could never have obtained in open conflict with Portugal's naval command.³ As other nations accepted his premises, not only was the concept of international law born but also a new method for achieving aims against an adversarial country without war.

Lawfare has always thus been intricately linked to information. The term *lawfare* was popularized shortly after September 11, 2001, in an essay by then-Colonel Charles Dunlap, Jr., USAF. Now a noted scholar on the law of armed conflict, retired Major

General Dunlap, a former Deputy Judge Advocate General of the Air Force, defines lawfare as “the use of law as a means of accomplishing what might otherwise require the application of traditional military force,” particularly by “those unable to challenge America’s high-tech military capabilities.”⁴

General Dunlap originally focused on the Taliban’s unlawful positioning of forces in or around protected places in hopes of deterring attacks or, even more preferable, using disinformation to accuse the United States and its allies of harming innocent civilians.⁵ In response to such actions, the United States and its partners created targeting restrictions beyond what is required by international law, giving the Taliban operating space that it could not have achieved on its own.⁶ Nonstate actors have mimicked such conduct throughout the Middle East, with a common scenario:

- Insurgents fire on U.S. or allied troops from mosques in clear violation of international law.
- U.S. and allied forces return fire in a proportional manner in accordance with international law.
- Prepositioned collaborators record the response.
- The conspirators release the recording via the Internet.⁷

Hamas’s intentional employment of civilians in harm’s way and subsequent cries of war crimes against Israel are some of the most effective of such tactics.⁸

This reliance on information has led some scholars to argue that lawfare is merely a specific form of strategic communications.⁹ However categorized, in today’s increasingly complex operating environment, the traditional elements of conflict are often overtaken by legal norms. And lawfare—if defined as the

use of law to accomplish an otherwise military objective—does not require the degree of asymmetry that impeded the Netherlands in the 1600s and nonstate actors over the last two decades of counterinsurgency operations.

Great Power Competition Through Lawfare

Russia is quite practiced at exploiting international law to expand its power. As Christi Bartman, an instructor of public law and judicial process at Bowling Green State University, noted, “The concept [of lawfare], if not the terminology, was in use by the Soviet Union long before the term became known.”¹⁰ As early as 1933, the Soviet Union devised to insert the state crime of aggression into a treaty with Afghanistan, Estonia, Latvia, Persia, Poland, Romania, and Turkey to obtain a measure of predictability regarding the conduct of those nations.¹¹ Similar accords—for example, the Rome Statute, which established the International Criminal Court and uses nearly verbatim language to the 1933 treaty—have often given Russia a degree of consistency from other countries, even when it has no intent to abide by the agreements itself.¹² As long as its own offensive actions are not against a party to the North Atlantic Treaty Organization or otherwise overt enough to garner broad political consensus as armed attacks, Russia has enjoyed the Alliance’s dependable decision not to respond with force—inaction that is consistent with international law.

Both the Soviet Union and, more recently, the Russian Federation have gone much further, blurring legal lines to exploit the uncertainty that ensues, creating challenges for those “who adhere to international law within good faith and the commonly agreed frameworks established under and governed by the principles of the rule of law.”¹³ Through both domestic and international propaganda, Russia has “worked exhaustively to place the face of the aggressor on the United States” in Korea, Vietnam, and Syria.¹⁴ In fact, in the Syrian conflict, Russia has simultaneously argued that its military action

is authorized under the United Nations Charter because the government of Syria requested Russia’s assistance, while also condemning U.S. and coalition activity as violating international law.¹⁵ Its “peacekeepers” are therefore able to accomplish the Kremlin’s strategic objectives in the Middle East and confound coalition forces without openly engaging them.

It is Russia’s active use of propaganda, in conjunction with treaties, that has best allowed it to manipulate and exploit the international legal system and achieve military and political objectives.¹⁶ One prime example is the Soviet Union’s invasion of Poland and Finland in 1939. Shortly after Germany invaded Poland in that year, the Red Army responded by declaring Poland a collapsed government and annexed portions of the country for the Soviet Union before moving on to Finland.¹⁷ The Soviet Union’s justification was the “self-defense of Leningrad and a ‘request’ by the ‘government’ of Finland”—disinformation that it used repeatedly, for example, in Afghanistan, and that in more recent years the Russian Federation has used in both Georgia and Ukraine.¹⁸ In February 2022, Russia unleashed the largest assault in Europe since World War II when it invaded Ukraine on multiple fronts. Its claimed goal is to demilitarize and de-Nazify Ukraine, or, in other words, to protect ethnic Russians from supposed genocide by Ukraine’s government. The country thus has a long history of claiming a legitimate legal basis for the use of force—self-defense against another nation’s aggression—to carry out illegitimate actions not supported by facts.

For its part, China has been more innovative in the way it actively interprets laws, giving it the capability to restrain adversaries and seize the political initiative. In an address prepared for the 19th Party Congress in 2017, Chinese President Xi Jinping specifically called for China to shape rules to its advantage.¹⁹ As far back as 1996, People’s Republic of China (PRC) President Jiang Zemin advised a group of Chinese international law experts that China must “be adept at using international law as a weapon.”²⁰ And the concept

has been a part of Chinese doctrine nearly as long; the People’s Liberation Army (PLA) published a book in 1999, written by two PRC colonels, that “repeatedly referenced the concept of using law as a weapon, sometimes referring to it as ‘legal warfare.’”²¹ Since then, the PLA has published at least three books that deal exclusively with the concept of lawfare.²² Finally, domestic laws such as the 2005 Anti-Secession Law are intended to provide the legal justification for any move against Taiwan (or other desired territory).²³

However, China’s primary *modus operandi* is to reinterpret international laws, particularly regarding the sea, space, and cyber domains, in a way most favorable to its interests and least beneficial to its adversaries.²⁴ In their own words, Chinese strategy involves “arguing that one’s own side is obeying the law, criticizing the other side for violating the law, and making arguments for one’s own side in cases where there are also violations of the law.”²⁵ This strategy is most obvious in China’s actions in the South China Sea. The country continues to expand its presence in the coastal waters, attempting to deny warships and aircraft of the United States, Japan, and other countries access to the region through intentional interpretation of international law that is favorable to China but counter to international norms. When the United States or its allies do respond, China, like Russia, claims the other party is the aggressor.

Although popular opinion in the West is not swayed by China’s arguments of legitimacy, China is not dissuaded, and its methods have intensified. In particular, China has spent decades and enormous resources building up contested “rocks” and “low tide elevations” into artificial islands, some now complete with military installations, to expand its territory and, more importantly, its territorial seas.²⁶ Claims that such manufactured islands are territory entitled to exclusive seas are viewed as less than dubious by nearly every other nation, an opinion affirmed as a categorical defeat for China in the 2016 Permanent Court of Arbitration decision in *Philippines v. China*.²⁷

However, each passing day that its assertions are not answered makes them more customary, if not international law. China uses the same methods in space and the cyber realm, consistently accomplishing strategic objectives in all three domains while remaining below the threshold for open armed conflict. No doubt China is watching closely both Russia's invasion of Ukraine and the international response.

U.S. Lawfare

The United States has a long history of employing the law legitimately through traditional commercial means, sanctions, influence, and criminal prosecutions to achieve tactical, operational, and strategic objectives. For example, in both Operation *Desert Storm* and Operation *Enduring Freedom*, exclusive contracts were used to keep commercial satellite imagery from falling into hostile hands.²⁸ The U.S. Government uses similar economic pressure in the form of sanctions to prevent "foreign terrorist organizations from receiving material support."²⁹ Likewise, sanctions have been effectively used against Iran and North Korea. As General Dunlap noted, when the coalition invaded Iraq in 2003, "sanctions crippled the Iraqi air force to the point where fewer than one-third of its aircraft were flyable . . . grounded just as effectively as if they were shot down."³⁰ Many U.S. leaders and scholars have even suggested, in response to the 2022 invasion of Ukraine, transferring assets lawfully seized from Russia directly to Ukraine.³¹ Moreover, regarding the specific creation of international law, no one nation has historically been as dominant as the United States. Finally, criminal prosecutions round out the U.S. Government's lawfare arsenal and have been used to address the threat of Soviet espionage during the Cold War, combat terrorism, and fight possible corporate espionage by Chinese telecom giant Huawei.³² Yet the joint force lacks the ability to address the expanding use of lawfare by Russia and China.

Commendably, some of the values inherent in democracies make it impossible to compete with the united and

coordinated approaches of autocracies. Each of the identified U.S. actions represents legitimate capabilities of other agencies of the government, because—unlike the tyrannical regimes of Russia and China—the Department of Defense (DOD) and civilian agencies are intentionally separate. Likewise, U.S. respect for Western values prohibits the harmony of action Russia and China can impose on their own respective private sectors. Under these circumstances, it is obvious that U.S. military and interagency community efforts are not as coordinated as their adversaries.

It is regrettable, however, that, as law professor Orde Kittrie notes in his book *Lawfare*, the United States has "no lawfare strategy or doctrine, and no office or interagency mechanism that systematically develops or coordinates U.S. offensive lawfare or U.S. defenses against lawfare."³³ As stated, China has adopted lawfare as a major component of its strategic doctrine. And in response to some of the most effective applications of lawfare— Hamas's placement of civilians to either check Israel's use of force or claim that Israel has committed war crimes when noncombatants are injured—Israel has created an office specifically focused on addressing legal warfare.³⁴ But despite the same tactic having been used against coalition forces in Iraq and Afghanistan, and the warnings similar to those that General Dunlap has been sounding for two decades, the joint force can only "react to contact" and take some cues from the Department of Justice (DOJ).

Recommendations

Given the extent and effectiveness of peer competitors, the joint force must develop the capability to analyze, anticipate, and blunt the various lawfare strategies employed by Russia and China through senior leader emphasis and changes to the organization and development of military attorneys. Combatant commanders must possess the capability to identify the various lawfare strategies in use and respond appropriately. To be clear, the United States should never consider the sorts of ille-

gitimate applications of the law that its competitors use or, for that matter, that they claim the United States is engaged in. However, there is much that can be done without any ethical compromise. First, senior leaders must come to terms with the threat posed by adversarial use of lawfare and emphasize the challenges and opportunities. Next, joint doctrine should recognize the existence of lawfare, its use by adversarial powers, and the need for executive agents to steward a joint capability to address oppositional lawfare. Finally, changes must be made to the organization and development of judge advocates and DOD civilian attorneys.

At the most senior levels, for coordination purposes, Congress should establish a joint Department of State/DOJ-led organization stewarding the Nation's whole-of-government lawfare efforts. Similarly, both agencies must be better prepared to combat foreign actors' legal disinformation, to say nothing of other types. However, the 2019 National Defense Authorization Act specifically requires the Secretary of Defense to evaluate U.S. military capabilities to compete against its peer adversaries. Since U.S. adversaries use coordinated lawfare, military legal professionals need to be able to observe and understand, forecast, and provide advice.

Within the joint force, lawyers are often not involved in strategic planning, partly because they are not viewed as planners and partly because they are spread thin, having diverse focuses and suffering constant turnover that present severe challenges for even the finest attorneys. Most often, fellow leaders do not know what they are missing by excluding a lawyer's opinion. Nearly all U.S. military leaders receive training in strategic thinking relatively late in their careers, and judge advocates, because their expertise is in law, are often not given the same opportunities as their line brothers and sisters to pursue strategic broadening. This leads to situations in which attorneys may merely be ignorantly excluded from the discussion. Thus, senior leaders must not only highlight the threat but also emphasize the assets available.



Israel Defense Forces soldiers during May 2021 rocket attacks on Sderot, Ashkelon, Ashdod, Jerusalem, and other communities by Hamas and Palestinian Islamic Jihad (Courtesy Israel Defense Forces)

Furthermore, more opportunities should be available for all U.S. military leaders to train in strategic thinking earlier, updated curriculums should emphasize the importance of legal assets in strategic planning, and, in his role as global integrator, the Chairman of the Joint Chiefs of Staff (CJCS) should have a more robust legal support team.³⁵ Although currently the CJCS Legal Counsel operates with approximately 20 percent of the staff as the General Counsel to the Office of the Secretary of Defense,³⁶ a future empowered Joint Staff legal office would come complete with an honors program. Like the honors programs of the Army General Counsel and the Chief Counsel of the Army Corps of Engineers, this office would recruit junior field-grade judge advocates (majors and lieutenant commanders) into a strategy-focused national security law career.

This Joint Staff Legal Honors program would not only support the efforts of the CJCS as global integrator but also develop significant expertise early in a judge advocate's career. Under the Army's Judge Advocate development model, military attorneys attend standard professional military education—a basic course, a graduate-level course, intermediate-level education not specific to attorneys, and finally the graduate-level senior Service college—but none of those educational opportunities are tailored to an expertise in lawfare.³⁷ A select few may be chosen to pursue an advanced law degree from a civilian institution, but again, the chosen coursework varies across the core competencies; even fewer will focus on national security law.³⁸ Like other officers, however, judge advocates traditionally change assignments approximately every 2 to 3 years, hardly conducive to developing the regional

expertise necessary to understand the specific strategies and implementing actions of Russia and China. Civilian attorneys provide continuity and some specialization, both at commands and at the Services' General Counsels' Offices, but their strategic-level training, such as from the senior Service colleges, is not necessarily commensurate with that of their nonlawyer colleagues. A Joint Staff Legal Honors program would address this training gap.

Such an office should also be significantly maintained with the wealth of experience held by Reserve Component attorneys. These judge advocates can lend their expertise to new recruits while building the office without Active Component growth. Rookie attorneys should do tours in the Pentagon focused on national strategic-level legal issues under the leadership of these experts. After their initial tours, some

should be sent to obtain an advanced degree in national security or international law, while others should complete follow-on assignments at geographic combatant commands.

Additionally, new initiatives to establish regional expertise should become the norm, particularly among those attorneys selected to serve at geographic combatant commands. As General Dunlap notes, the “legal machinations of Russians waging hybrid war are not necessarily the same as China’s legal warfare in the South China Sea or the Islamic State’s ruthless exploitation of human shields to ward off high-tech weaponry.”³⁹ Finally, each of the Services should utilize a more purposeful assignment of its highly qualified Reserve Component attorneys at strategic-level organizations. The U.S. Army Judge Advocate General’s Corps has recently begun to implement some of these strategic talent management programs in response to the current operating environment. Only through systemic emphasis and organizational change of this sort can the joint force address its competitors’ expanding use of lawfare.

As the joint force undergoes its self-examination, senior leaders must give sufficient importance to the U.S. capability to compete with adversaries’ use of lawfare. If the United States continues to rely solely on the disorganized efforts of other partners in the whole of government, it will continue to put the country at a military disadvantage. Lawfare is a strategic weapon system that has impacts both on the world stage and on the ground. To end the continuing degradation in comparative power, senior leaders must take notice, and attorneys in uniform must be better equipped and prepared to analyze, anticipate, and blunt the various lawfare strategies employed by Russia and China. JFQ

Notes

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NDU Press and the NDU Foundation Congratulate the Winners of the 2022 Essay Competitions

NDU Press hosted the final round of judging on May 12–13, 2022, during which 31 faculty judges from 18 participating professional military education (PME) institutions selected the best entries in each category. There were 97 submissions in this year’s three categories—the second most entries ever. First Place winners in each of the three categories appear in the following pages.

Secretary of Defense National Security Essay Competition

The 16th annual competition is intended to stimulate new approaches to coordinated civilian and military action from



a broad spectrum of civilian and military students. Essays address U.S. Government structure, policies, capabilities, resources, and/or

practices and provide creative, feasible ideas on how best to orchestrate the core competencies of our national security institution.

1st Place

Jeffrey D. Graham, Department of State

National War College

“Building an Enduring U.S.-India Partnership to Secure a Free, Open, and Prosperous Indo-Pacific Region”

2nd Place

Lieutenant Colonel Steven J. Curtis, USA

U.S. Army War College

“A New Character: Rethinking Intelligence for 2035”

3rd Place

Lieutenant Colonel Kevin J. Consedine, USA

U.S. Army War College

“Be All You Can Be . . . Like Your Parents”

Chairman of the Joint Chiefs of Staff Strategic Essay Competition



This annual competition, in its 41st year in 2022, challenges students at the Nation’s joint PME institutions to write research papers (5,000 words) or articles (1,500 words) about significant aspects of national security strategy to stimulate strategic thinking, promote well-written research, and contribute to a broader security debate among professionals.

Strategic Research Paper

1st Place

Lieutenant Colonel Ryan Tate, USA
U.S. Army War College

“Transparent Cyber Deterrence”

2nd Place

Commander Von P.H. Fernandes, USN; Lieutenant Colonel Nita McQuitery, USAF; Major Lucas Hoffman, USA; and Major Ashley Gunn, USAF

Joint Forces Staff College–Joint and Combined Warfighting School

“The World in 90 Minutes or Less: Rocket Logistics and Future Military Operations”

3rd Place

Lieutenant Commander Stephanie Pendino, USN; Major Robert K. Jahn, Sr., USA; and Mr. Kirk Pedersen, Defense Intelligence Agency

Joint Forces Staff College–Joint and Combined Warfighting School

“Declaratory U.S. Cyber Deterrence: Bringing Offensive Capabilities into the Light”

Strategy Article

1st Place

Captain Kimberly Sandberg, USN; Captain Kevin Pickard, Jr., USN; Lieutenant Colonel Jay Zwirblis, USAR; and Lieutenant Colonel Speight H. Caroon, USAF

Joint Forces Staff College–Joint and Combined Warfighting School

“Health Diplomacy: A Powerful Tool in Great Power Competition”

2nd Place

Major Lim Wonho, Republic of Korea Air Force

Air Command and Staff College

“Implications of South Korea’s Growing ‘Middle Power Identity’ in the East Asia Policy”

3rd Place

Captain Jonathan J. Park, USAF

Marine Corps University–Expeditionary Warfare School

“Traumatic Brain Injuries: Improving the U.S. Military’s Diagnoses Process”

Joint Force Quarterly Maerz Awards

In its 7th year, the *JFQ* Maerz Awards, chosen by NDU Press staff, recognize the most influential articles from the previous year's four issues. Five outstanding articles were chosen for the Maerz Awards, named in honor of Mr. George C. Maerz, former NDU Press managing editor.

Forum

Daniel E. Rauch and Matthew Tackett
“Design Thinking,” *JFQ* 101 (2nd Quarter 2021)

JPME Today

Anand Toprani
“Hydrocarbons and Hegemony,” *JFQ* 102 (3rd Quarter 2021)

Commentary

Montgomery McFate
“The Myths of Lyme Disease: Separating Fact from Fiction for Military Personnel,” *JFQ* 100 (1st Quarter 2021)

Features

Brent D. Sadler
“Avoiding Great Power Phony Wars,” *JFQ* 102 (3rd Quarter 2021)

Recall

Frank G. Hoffman
“Wartime Innovation and Learning,” *JFQ* 103 (4th Quarter 2021)

Joint Doctrine

Michael Clark, Erik Jorgensen, and Gordon M. Schriver

“Read the Manual: Reversing the Trends of Failure in NATO Humanitarian Interventions with Airpower,” *JFQ* 103 (4th Quarter 2021)

Distinguished Judges

Thirty-one senior faculty members from 18 participating PME institutions took time out of their busy schedules to serve as judges. Their personal dedication and professional excellence ensured a strong and credible competition.

Front row, left to right: Dr. Brandy Lyn Brown, Marine Corps War College; Dr. Jeffrey A. Turner, Joint Forces Staff College–Joint Advanced Warfighting School; Dr. Nicholas M. Anthony, Jr., Joint Forces Staff College–Joint Combined Warfighting School; Dr. David P. Hadley, College of International Security Affairs; Dr. Elizabeth D. Woodward, Air War College; Dr. Richard P. Samuels, Air War College; Dr. John G. Terino, Air Command and Staff College; Dr. Jim Chen, College of Information and Cyberspace; Carl J. (“CJ”) Horn III, Air Force Cyber College; Dr. Robert T. Davis II, Command and General Staff College; Ms. Leigh Caraher, U.S. Army War College; Dr. Antulio J. Echevarria II, U.S. Army War College;

Dr. Charles Chadbourn, U.S. Naval War College; Ms. Caroline V. Schweiter, NDU Press. Back row, left to right: Dr. John J. Church, NDU Press; Dr. Todd Holm, Marine Corps War College–Electronic Warfare School; Dr. Jeffrey D. Smotherman, NDU Press; Dr. Sinan Ciudad, Marine Corps Staff College; Dr. Thomas Sheppard, Marine Corps Staff College; Dr. James R. Van de Velde, Eisenhower School for National Security and Resource Strategy; Mr. John O’Brien, College of Information and Cyberspace; Dr. William T. Eliason, NDU Press; Dr. Mark A. Bucknam, National War College; Captain Alex J. Lega, USAF, Air University Global College of PME; Dr. Amy R. Baxter, Air University Global College of PME; Dr. Paul J. Springer, Air Command and Staff College; Ms. Joanna E. Seich, NDU Press; Ms. Shira Klapper, NDU Press. Not shown: Dr. Donald W. Chisholm, U.S. Naval War College; Dr. Grant R. Highland, Joint Forces Staff College; Captain Todd S. Glasser, USN, National War College; Dr. James Kiras, School of Advanced Air and Space Studies; Dr. Nicholas E. Sarantakes, U.S. Naval War College; Dr. Naunihal Singh, U.S. Naval War College; Dr. Mark G. Sorensen, Command and General Staff College; Dr. Donald Stoker, Eisenhower School for National Security and Resource Strategy.





Boatswain's Mate 2nd Class Kelvin Tyler directs Indian Navy Sea King Mk42B helicopter into position to touch down on flight deck of guided-missile destroyer USS *Sterett* during cross deck landing exercise as part of Malabar 2020, Indian Ocean, November 20, 2020 (U.S. Navy/Drace Wilson)

Building an Enduring U.S.-India Partnership to Secure a Free, Open, and Prosperous Indo-Pacific Region

By Jeffrey D. Graham

The United States has a national interest in a free, open, and prosperous Indo-Pacific region, where international laws, rules, and norms are

respected, state sovereignty is secure, and nations pursue economic growth in an environment of fair competition. A free and open Indo-Pacific underpins the security of the American homeland and U.S. allies, continued U.S. economic growth, and preservation of the rules-based international order.¹ China poses the greatest threat to this

interest by using its growing economic and military power to deprive the United States of intellectual property and military secrets, to limit economic and security choices for countries in the region, and to attempt to rewrite the rules governing the Indo-Pacific. By partnering with India, the United States can achieve the political aim of

Jeffrey D. Graham, Department of State, wrote this essay while a student at the National War College. It won the 2022 Secretary of Defense National Security Essay Competition.



U.S. and Indian special operations forces conduct military freefall training from U.S. Army CH-47 Chinook helicopter during Rim of the Pacific 2022 exercise, Wahiawa, Hawaii, July 15, 2022 (U.S. Army/Timothy Hamlin)

a free, open, and prosperous Indo-Pacific region where a robust U.S.-India economic and security partnership counters China's aggressive behavior, disregard for international law and norms, and efforts to recast international institutions.²

To achieve this aim, the United States should create an enduring U.S.-India economic partnership that drives India's growth, increases bilateral trade and investment, and offers alternative public goods to countries in the Indo-Pacific region; support India in becoming a net exporter of security in the region; and leverage India, as the world's largest democracy and supporter of the existing rules-based order, to strengthen regional institutions and set norms and standards. In addition to countering China's coercive behavior, achieving these objectives takes advantage of opportunities presented by India's growing market and expanding middle class to drive U.S. prosperity.

To succeed, the United States must account for India's fierce independence and its domestic political and economic challenges, while committing the necessary human and financial resources to aggressively advocate for and support reform in and cooperation with India. This strategy takes advantage of China's missteps in the region, is closely aligned with the *Indo-Pacific Strategy of the United States*, draws on multiple existing U.S. Government lines of effort, and builds on two decades of U.S. interest in deepening cooperation with India. This strategy also gratefully acknowledges and borrows from many excellent ideas already put forward by government agencies, think tanks, and scholars, and recognizes that U.S. interests in India go far beyond simply countering China's coercive behavior. In taking a narrow approach, it attempts to highlight those key lines of effort—especially opening and growing India's economy—that are most likely to achieve success in securing a free, open, and prosperous Indo-Pacific, and to do so in a manner that relies not on new initiatives or significant budgetary increases, but on intense, focused, strategic engagement.

China, India, and the U.S. Domestic Context

China's behavior and choices are driven by the Chinese Communist Party, which seeks to ensure regime survival by delivering economic growth that outpaces demands for political rights, maintaining social stability, recovering what it claims to be China's historic territory, and restoring China to the top of the regional order and among the Great Powers.³ China's remarkable economic growth since the 1980s (aided by rampant theft of intellectual property) has lifted hundreds of millions into its middle class and secured vast sums of foreign exchange. This has fueled China's military modernization and rise toward Great Power status. Under the leadership of Chairman Xi Jinping, this rise has been accompanied by neo-Leninist reforms to tighten domestic control and by increased threats to prevent Taiwan from declaring independence.⁴ China's militarization of the South China Sea and creation of a blue-water navy are intended to assert control over essential shipping lines and natural resources and to complicate the U.S. defense of Taiwan. China has weaponized trade and tourism, exacting punishment for perceived slights. Beijing's creation of new regional bodies and financial institutions, its efforts to internationalize the renminbi, and its push for greater influence within multilateral institutions flow from its sense that its history, population, and economy warrant a larger global role.⁵

China faces economic headwinds, however, from an aging population, rising labor costs, and excessive debt, leading to efforts to promote domestic consumption and to support self-sufficient industries.⁶ China uses its Belt and Road Initiative (BRI), offering massive investments often paired with debt-trap financing, to secure resource inputs, construct overland shipping routes, and employ excess capacity, while providing cover to build dual-use maritime ports.⁷ While many countries in the Indo-Pacific rely on China's market for growth, its aggressive behavior has driven neighbors

to turn toward the United States for assurances of regional security.⁸

Like China, India believes its population, history, and economy warrant a larger global role. Traditional leader of the postcolonial nonaligned movement and geographically isolated, India was long preoccupied by nuclear-armed rival Pakistan, which received support from both the United States and China. The shift in U.S.-Pakistan relations during the war on terror prompted Delhi to look more favorably on Washington.⁹ India maintained long-simmering tensions with China over land borders and India's decision to host the Dalai Lama and Tibetan refugees. A series of tense confrontations, including a 2020 clash in the Galwan River Valley that left 20 Indian soldiers dead, forced a shift in India's calculus.¹⁰ Beijing's decision to provoke Delhi in the midst of the COVID-19 pandemic, as well as China's BRI and pursuit of dual-use ports situated in India's neighbors, has furthered mistrust of China's intentions.¹¹ To balance China's ambitions, India has increased engagement with Southeast Asia and embraced the Quad with Australia, Japan, and the United States.¹² At the same time, India's large trade imbalance and deep links to China's economy, China's control of transboundary water flows, and India's need to maintain rapid economic growth check Delhi's willingness to push Beijing.¹³ China is mindful of India's rise but sees India as below it in the regional order and expects India to respect its superiority.¹⁴

Economically, India's rapid growth is driven by an enormous and expanding population that is young, diverse, English-speaking, and well educated. Yet India also faces headwinds, continuing to lag far behind China because of failure to enact needed economic reforms, tensions between ambitious climate targets and the need to vastly expand energy access, widespread corruption, and a cautious approach to trade.¹⁵ This translates to a smaller middle class, a less attractive market for global goods, and fewer foreign reserves to fund influential overseas investments. India's federalist democracy with strong state governments, its diverse population, and its active civil society

make political consensus difficult. The rise of Hindu nationalism under Prime Minister Narendra Modi and the ruling Bharatiya Janata Party (BJP), and the BJP's tolerance for anti-Muslim violence, has dampened the vibrancy of India's pluralistic system.

The shift in the U.S. strategy toward China from cooperation to competition has led to a broad U.S. consensus on India's potential as an alternative market and partner in countering China's aggression.¹⁶ The United States should not assume, however, that India will be completely compliant. India's geopolitical constraints, complex politics, need for continued rapid economic growth, and legacy of nonalignment and nonintervention mean that it will continue to take a cautious approach.¹⁷ As the U.S. Mission to India's own public-facing strategy notes, the relationship remains "hampered by suspicion, hesitation, and a surprising lack of cooperation" that undermine common interests.¹⁸ The broad scope of the relationship, ranging from defense to economics to shared values, as well as the large Indian diaspora community, means India has a diverse set of U.S. constituencies that could be in tension with one another. Congressional disagreement over U.S. immigration policy, especially as it relates to visas for Indian students and highly skilled workers, is already an irritant. Polarization of U.S. domestic politics and weakening of democratic institutions could erode India's perception of the United States as a role model.¹⁹ U.S. inflationary pressures and uncontrolled deficit spending could derail strategic focus or prevent necessary investments in the relationship. On the flip side, failure by India to take climate targets seriously, the BJP's turning a blind eye to Hindu extremism, or continued Indian recalcitrance toward economic reforms and trade talks could dampen U.S. enthusiasm. Of particular concern are India's purchase of U.S.-sanctioned weapons systems from Russia and its refusal to criticize Russia for its invasion of Ukraine.²⁰ Washington's view that allies and partners should be in lockstep with U.S. policies across the spectrum could create unrealistic expectations for independent-minded India.²¹

Economics Drives Security: A Theory for Achieving Success

Economics drives security, especially in Great Power competition, and a stable rules-based order undergirds and reinforces prosperity and security.²² China's coercive economic policies deprive the United States of valuable intellectual property and military secrets, while limiting economic and security choices for countries in the region. The United States must support India's reform efforts because only a richer India can be an effective counterweight in the region. Increasing the openness of India's market will encourage U.S. businesses to diversify supply chains, decreasing China's control of critical industries and emerging technologies while directly supporting American prosperity. Partnering with India to create choices and drive standards for the region will reduce countries' dependence on China and limit its ability to coerce behavior. Partnering with India to increase security in the Indo-Pacific will further decrease China's ability to intimidate its neighbors and threaten key maritime shipping routes, thus increasing stability and security. By leveraging India, as the world's largest democracy and supporter of international norms, the United States can shore up the rules-based order regionally and globally, limiting China's ability to rewrite rules and standards.

U.S. efforts to accomplish these objectives should run in parallel with support for India's economic opening and growth, enhancing the chances of success for supporting India's evolution into a net exporter of regional security and provider of alternative public goods as well as its role in bolstering the regional rules-based order. Supporting India's long-term growth is an ongoing task, while other tasks should be focused on a 5- to 10-year horizon given the urgency to counter China's aggression, though some increased military engagement will take longer than 10 years. Given Indian sensitivities, this strategy does not emphasize information campaigns to publicize U.S.-India cooperation to counter China, instead encouraging the United

States to lead through tangible actions. This strategy assumes that such actions, once accomplished, would be amplified through existing information and public diplomacy channels.

This strategy makes several key assumptions:

- there will be no major war in the Indo-Pacific in the next 10 years
- China's economic growth will slow but will continue to outpace India's
- the race for maritime dominance of the Indian Ocean will intensify in the next decade
- low-level China-India border tensions will persist
- India will maintain strong adherence to the United Nations (UN) system, will avoid formal alliances and coalitions of the willing, and will not choose to isolate Russia
- BJP will remain in power through at least 2029 and will continue to take halting steps toward economic reform and liberalization
- U.S. support for India will remain strong while U.S. views of China will grow increasingly negative
- Quad evolution will continue but be limited by India's unique worldview.

Creating an Enduring U.S.-India Economic Partnership

The first and primary objective of this strategy is for the United States to help India grow while opening its market to increased U.S. trade and investment, while also working together to offer higher quality alternatives to the region in infrastructure, health security, and climate resilience, among other areas. UN Sustainable Development Goal indicators can track India's overall growth, while progress on domestic and trade- and investment-related reforms can be tracked by the many steps needed to reach a free trade agreement and bilateral investment treaty. The United States should aim to see significant progress on trade, investment, and energy-related reforms over the next 5 to 10 years, a critical period in shoring up the Indo-Pacific and blunting China's influence.²³ Joint initiatives

and successes should be publicized in a positive, pro-India tone rather than a counter-China tone.

First, the United States should support India's domestic economic reforms to drive sustainable growth. India's ability to counter China's aggression and serve as an alternative market and manufacturing source for supply chains depends on its continued economic growth, and a richer India will be better placed to provide security and public goods to the region. While the United States cannot fix India's many problems, it can provide targeted advocacy and assistance to India's own efforts, building goodwill and accelerating reform. Working through the U.S. Agency for International Development (USAID), the United States should support India-led efforts to improve underlying basic conditions, including access to quality health care, potable water, and education, which will foster growth by improving public health and extending lifespans.²⁴ At the same time, led by the Office of the U.S. Trade Representative (USTR) with support from other agencies, the United States should discuss, advocate for, and provide technical assistance on a broad range of non-trade-related economic reforms to policies identified by the BJP, the U.S. Government, and others as impediments to growth.²⁵ This includes reforms in debt, commercial dispute resolution, land acquisition, price controls, privatization, and taxation. USTR should also support financial regulatory reforms, with advocacy from the Departments of State and Commerce and technical support from USAID.²⁶ Led by the Department of the Treasury, the United States should support ongoing banking- and insurance-sector reform, including development of capital markets.²⁷

The United States should support India-led improvements to infrastructure under the U.S.-India Economic and Financial Partnership, given infrastructure's essential role in facilitating growth. Building on the U.S. International Development Finance Corporation (DFC)'s equity investment in India's National Infrastructure and Investment Fund, Treasury can provide technical



President Joe Biden participates in bilateral meeting with Indian Prime Minister Narendra Modi, Tuesday, May 24, 2022, at Kantei, in Tokyo (The White House/Adam Schultz)

support for the issuance of municipal bonds for urban infrastructure projects, while USAID can support implementation of international-standard environmental, social, and corporate governance policies for infrastructure development.²⁸

Second, the United States must support India's energy transition. India needs to vastly expand energy access to support economic growth and bring electricity to hundreds of millions while meeting ambitious climate targets. U.S. support for India's planned reforms and changes to its energy mix, including renewables, clean gas, and nuclear, will complement and drive U.S. efforts to support India's economic reforms, provide opportunities for U.S. energy and technology exports, and support India's climate agenda while improving air quality and public health.²⁹ These efforts should be aligned with the U.S.-India Climate and Clean Energy Agenda 2030 Partnership, including the Climate

Action and Finance Mobilization Dialogue and the U.S.-India Strategic Clean Energy Partnership.³⁰

Working through DFC, the Department of Energy, and USAID, the United States should mobilize financing by supporting Indian reforms to allow for green bonds and to decrease real and perceived investment risks. This effort would complement DFC's own debt financing and would benefit from other efforts to improve the overall investment climate.³¹ In addition, the United States should support India's shift in subsidies away from fossil fuels toward renewables and/or cleaner sources and encourage India to follow Indonesia in opting for G20 self-reports and peer reviews of its fuel subsidies to provide leverage for convincing domestic policymakers to support the transition.³² To assist better integration of India's "all of the above" approach to energy, the United States should provide technology for battery storage and grid

management.³³ It should encourage the central government to build a coalition of willing BJP-led state governments to increase energy trading between state utilities, leading eventually toward nationwide changes.³⁴

Because renewables alone are unlikely to meet India's energy demand, the United States should support responsible development of oil, gas, and nuclear power through provision of expertise and technology for reducing use of high-pollution fuels, carbon and methane abatement, strategic management of petroleum reserves, and advanced civil nuclear technology.³⁵

Third, the United States should work to increase the openness of India's market and decrease barriers to U.S. trade and investment. Opening India's market and decreasing barriers on both sides to trade and investment will enhance American prosperity and support supply chain diversification away from China. Led by



Admiral John C. Aquilino, commander of U.S. Indo-Pacific Command, left, Colonel Aakash Khazanchi, center, and Brigadier A.S. Randhawa, speak before wreath laying ceremony at India's National War Memorial, New Delhi, April 25, 2022 (U.S. Navy/Anthony J. Rivera)

USTR, the United States should support reforms outlined by the U.S.-India Trade Policy Forum, including Indian reforms in such sectors important to U.S. exports and foreign direct investment as agriculture, goods, services, insurance, investment, and intellectual property.³⁶ The Department of State and Department of Homeland Security should dialogue with Indian counterparts on visa issues to facilitate the two-way movement of students, professionals, skilled workers, experts, and scientific personnel—an issue important to India.³⁷

In parallel with this, USTR and Congress should decrease U.S. barriers to bilateral trade and investment, restoring India's beneficiary status under the U.S. Generalized System of Preferences and reducing tariffs in such key industries as steel and aluminum.³⁸ USTR and the State Department should resume bilateral investment treaty negotiations, paused in 2017, to increase U.S. investor confidence.³⁹ USTR and the State Department should commit to bilateral dialogue in future areas of agreement, including labor and environmental issues, to build momentum toward a free-trade agreement as a long-term goal to motivate India to make reforms.

To entice U.S. companies in critical industries to shift supply chains to India, the United States and India should provide joint incentives, which could include tax incentives from India to entice companies to move, coupled with preferential tax and tariff incentives from the United States for critical technology products made in India. Given that India's decision to make economic reforms is often tied to major business deals, U.S. Government investments could nudge India to make broader economic reforms.⁴⁰ This effort should be supported by the Department of Commerce's U.S.-India CEO Forum and U.S.-India Commercial Dialogue.

The fourth component of achieving an enduring U.S.-India economic partnership is to work with India to expand economic choices for countries in the region to reduce dependence on China. While the United States and India should not appear defensive by competing directly with China's BRI, they should play to

their strengths by using government tools to support private-sector financing of high-quality, transparent, and sustainable projects in Indo-Pacific countries. If countries rely less on the BRI, they can avoid debt traps and lessen China's influence.

To provide a framework for this effort, in the wake of the release of the U.S. Indo-Pacific Economic Framework for Prosperity, the State Department and USTR should create a similar framework built around U.S.-India economic cooperation in the region to include trade facilitation, standards for the digital economy and technology, supply chain resiliency, clean energy, and infrastructure.⁴¹

To support India's efforts to provide alternative public goods for the region, USAID and DFC can support efforts to strengthen the nascent National Bank for Financing and Development (NaBFID) as India's own development finance institution.⁴² With the NaBFID online, India could join the Blue Dot Network—an effort by the United States, Australia, and Japan—to support transparent private-sector investment in high-quality, sustainable infrastructure that complies with international laws and standards.⁴³ The National Security Council staff and the State Department should then harmonize Quad members' infrastructure programs for the region under the Quad Infrastructure Coordination Group, emphasizing that these programs follow the Build Back Better World principles of being financially, environmentally, and socially sustainable; guided by high standards and principles of good governance; and climate friendly.⁴⁴

The United States can further partner with India to support Quad initiatives in health security and climate resilience, including vaccine provision, green shipping, and hydrogen technology, demonstrating how the region's democracies can provide higher quality public goods than those offered by China.

Supporting India in Becoming a Regional Net Security Exporter

By helping India address not only its own security needs but also those of the region, the United States can decrease China's ability to threaten its neigh-

bors and violate security norms. Given China's rapid military modernization and naval expansion, U.S. efforts need to bear fruit as quickly as possible. Increases in bilateral communication and building habits of cooperation should be achieved in the next 5 to 10 years; building naval interoperability through foreign military sales and targeted training will take longer. This objective should build on existing bilateral defense agreements and incorporate an assessment, monitoring, and evaluation framework for security assistance to measure progress toward enhanced security cooperation, using such metrics as number of new military sales, increased exercise participation, and frequency of U.S. access to Indian bases.⁴⁵ Progress should be publicized in a way that avoids a counterproductive message of "containing" China.

First, the United States should support India's growth in maritime security. Given the Indian navy's interest in partnering with the U.S. Navy, the United States can expand and deepen navy-to-navy (N2N) cooperation to assist India in addressing China's maritime threat while nudging the Indian army and air force toward further cooperation. These efforts would be led by the Department of Defense (DOD) with support from the State Department.⁴⁶ They should be aligned with India's own Security and Growth for All in the Region initiative and the Indo-Pacific Oceans Initiative.⁴⁷

The United States can expand frameworks for N2N engagement by making exchanges more routine, expanding reciprocal access to bases, and deepening India's participation in combined exercises such as Malabar, Rim of the Pacific, and Cobra Gold.⁴⁸ To support N2N engagement, the United States can link international military education and training and foreign military sales to a coordinated joint U.S.-India strategy for regional contingencies, ensuring that training and weapons sold are employed in complex exercises and combined missions. This will help ensure interoperability and build habits of cooperation.⁴⁹ This DOD effort would be supported by the State Department.

In collaboration with Japan and Australia, the United States can help India increase its undersea maritime domain awareness (MDA), an area where India has requested U.S. assistance, by establishing a sound surveillance sensor chain supported by long-range maritime patrol aircraft, modeled on an existing strategic U.S.-Japan anti-submarine warfare program in the Pacific.⁵⁰ This can bolster broader U.S. efforts to enhance India's MDA to promote regional maritime security and reduce China's ability to limit access to the global commons. To push back on China's gray zone activities, the United States can enhance civil maritime cooperation through increased bilateral coast guard activities, such as joint law enforcement and rescue exercises.⁵¹

To broadly support the preceding efforts, the two countries should establish a Joint U.S.-India Intelligence Assessment Center at U.S. Indo-Pacific Command. This would build habits of cooperation among intelligence professionals, provide a platform for bilateral tabletop exercises, and allow for joint production of regional intelligence estimates.⁵²

Second, the United States should work to expand U.S.-India defense technology cooperation. India's designation as a major defense partner in 2016 provides a legal framework for expanding cooperation in research, development, and production of defense technology, leading to increased interoperability and potential joint military sales to third parties.⁵³ Progress in this area needs senior-level engagement. The United States should reinvigorate the U.S.-India Defense Technology and Trade Initiative (DTTI) and launch a parallel public-private partnership involving the two governments and respective defense industry companies to cooperate on defense technology, with a preference for non-state-owned Indian companies.⁵⁴ The four Service-led joint working groups—in land systems, naval systems, air systems, and aircraft carrier technology cooperation—should be given specific targets and be supported by industry partners. The United States can also leverage existing DOD incubator and accelerator programs, such as the Defense Innovation Unit and the Naval Research Laboratory, to support



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U.S., Indian, Korean, and German special operations forces conduct visit, board, search, and seizure training during Rim of the Pacific 2022, Pearl Harbor, July 1, 2022 (Courtesy Royal Canadian Armed Forces/Djalma Vuong-De Ramos)

and build a similar defense innovation ecosystem in India.⁵⁵ Increased defense innovation in India would accelerate cooperation under the DTTI.

Third, the United States should continue to build habits of military cooperation among Quad members, while carefully avoiding the appearance of a military alliance.⁵⁶ The Quad remains an informal political organization, with India making clear it does not want the body to become a military alliance and China decrying the concept as an “Asian North Atlantic Treaty Organization.” As part of its push to offer alternative public goods for the region, the Quad can offer enhanced regional security without taking steps toward an alliance. Quad member countries should expand exercises in ways that allow their military operators to gain experience working alongside one another. Habits of cooperation and experience, supported by enhanced interoperability gained through other lines of effort in this strategy, will better position the Quad as a provider of security goods to the region. Quad members can also mirror the bilateral U.S.-India expansion of operationally targeted military sales and increased defense technology cooperation. An expansion of the DTTI to encompass the Quad could create a powerful alternative defense industrial community in the Indo-Pacific backed by the region’s largest democracies. The United States can lead in expanding Quad information and intelligence sharing among the four partner countries, especially for MDA. Regularizing information/intelligence sharing would facilitate strong communication channels, further trust, and foster positive habits of cooperation. This would build on the posting of liaison officers by the United States in 2019 and Australia and Japan in 2021 to the Information Fusion Centre–Indian Ocean Region maritime information hub.⁵⁷

The fourth component of supporting India in becoming a regional net security exporter is to demonstrate U.S.-India security cooperation by providing humanitarian assistance and disaster relief (HADR). To underscore the values-based

approach that defines how democracies engage their neighbors as opposed to the approach taken by self-interested authoritarian regimes, the United States and India can be regional leaders in HADR. The United States and India should create a U.S.-India HADR Center for the Indo-Pacific to plan, prepare for, and engage in activities, demonstrating benign assistance in an area where China cannot currently compete.⁵⁸ The center could be in India’s Andaman Islands, indicating a geographic centrality for the Indo-Pacific region.

Leveraging India for Democracy and the Regional Rules-Based Order

China’s efforts to recast global norms and institutions to its advantage begin in the Indo-Pacific region. Its most conspicuous moves include attempts to split the consensus-based Association of Southeast Asian Nations (ASEAN), create parallel Beijing-led institutions such as the Shanghai Cooperation Organisation and Asian Infrastructure Investment Bank, and gain advantage over rival territorial claimants through gray zone tactics in the East and South China seas. As the region’s two largest democracies, the United States and India can strengthen regional institutions, take the lead in setting norms and standards, and demonstrate the value of democracy over authoritarianism. These efforts should be focused over the next 5 years, given threats to ASEAN’s relevance and the short time horizon for emerging domains and technologies. Success can be measured through the willingness of ASEAN bodies to speak out on norms and behavior and by the degree to which China adheres to existing norms. Public messaging on this objective should center on U.S.-India support for a rules-based regional order anchored by “ASEAN centrality.”⁵⁹

First, the United States should work with India to strengthen ASEAN and ASEAN-centered institutions. With a population of over half a billion people and a combined economy of over \$3 trillion, ASEAN can be a powerful force in the Indo-Pacific. The ASEAN-centered

regional institutions, including the 18-member East Asia Summit (EAS) and 27-member ASEAN Regional Forum (ARF), remain the region’s most significant multilateral bodies and provide venues for highlighting China’s norm-breaking.⁶⁰ This effort mutually reinforces efforts to provide economic alternatives, which can dampen China’s ability to use economic inducements to split ASEAN unity.

As part of this effort, the United States should encourage more aggressive Indian involvement with ASEAN, including in the EAS and ARF, to emphasize large country support for the sovereignty and independence of smaller countries and to encourage a rules-based approach to solving regional problems. At the leaders’ level, the U.S. President should commit to joining Prime Minister Modi at the EAS every year and schedule a high-profile U.S.-India bilateral meeting and joint statement highlighting the countries’ support for the ASEAN-centered regional architecture. At the working level, the United States should encourage India to more actively participate in like-minded meetings to align positions and ensure strong public statements.

The weakest links in consensus-driven ASEAN are the Mekong River Basin nations of Burma, Cambodia, and Laos. The United States and India can shore up those countries’ independence and resilience by better aligning the U.S. Lower Mekong Initiative and India’s Mekong-Ganga Cooperation.⁶¹ A formal U.S.-India partnership between these programs, which involve half the ASEAN countries but operate outside of ASEAN’s formal purview, could serve as an anchor for aligning with other Mekong-focused efforts by Japan, the Republic of Korea, Australia, and the European Union, and could effectively counter China’s efforts to dominate the subregion. Building on this, the United States and India, supported by Australia and Japan, could create maritime-focused initiatives parallel to the Mekong-focused programs. Bringing together the ASEAN maritime countries of Brunei, Indonesia, Malaysia, the Philippines, and Singapore, such



U.S. Marines and Sailors play tug-of-war with members of Visakhapatnam Government Home for Girls as part of exercise Tiger Triumph, in Visakhapatnam, India, on November 15, 2019 (U.S. Marine Corps/Armando Elizalde)

initiatives could provide venues for U.S.-India or Quad-led engagement on MDA, HADR, coast guard cooperation, and enforcement of international maritime law. In addition, the United States can encourage India and other Quad members to follow the U.S. lead in expanding bilateral cooperation across the ASEAN region to strengthen health security, address maritime challenges, increase connectivity, and deepen people-to-people ties.⁶² Given ASEAN sensitivities about the Quad, these activities should be done by individual Quad nations acting in alignment rather than formally as the Quad.⁶³

Second, the United States and India should work together to set and defend norms and standards in maritime and emerging domains. The United States and India can demonstrate leadership and provide diplomatic space for smaller countries by reinforcing accepted norms

and setting standards in the maritime space and in emerging domains and technologies, ensuring that the United States and its allies, rather than China, write the rules governing the Indo-Pacific.⁶⁴

For example, the United States can encourage India to stand up for maritime norms by making strong statements about international maritime law and freedom of navigation at the EAS, ARF, and other regional meetings, during bilateral visits with Indo-Pacific countries and in its own public statements. The United States should encourage India to join in freedom of navigation operations in the South China Sea. India's standing up for maritime norms in the East and South China seas would lay down a marker for China in the Indian Ocean region.⁶⁵ While China and other critics may attempt to undercut U.S. legitimacy on this issue by citing the U.S. Senate's longstanding refusal to ratify the

UN Convention on the Law of the Sea (UNCLOS), U.S. interlocutors can remind those critics that the United States follows UNCLOS as a matter of policy and is the global leader in defending freedom of navigation.

The United States and India can also work together to establish rules, norms, and standards that will govern emerging domains and technologies, including civil space, cyber, 5G telecommunications, biotechnology, and artificial intelligence. Such rules underpin the way domains and technologies are used in international trade and investment.⁶⁶ This will require collaboration in multilateral technical bodies, where China seeks to reshape definitions to suit its interests. Initial positive steps include a new U.S.-India Space Situational Awareness Arrangement and an agreement to launch a Defense Artificial Intelligence Dialogue.⁶⁷ Efforts can be amplified by Quad cooperation on the same issues.⁶⁸



U.S. Army and Indian marine commandos special operations forces conduct special operations urban combat training during Rim of the Pacific 2022, Kaneohe Bay, Hawaii, July 7, 2022 (U.S. Navy/Dylan Lavin)

A third component of leveraging India's role as the world's largest democracy is to work together to build democratic resilience in the Indo-Pacific. Democracy is under threat globally, and China's increasing confidence in the superiority of its system is furthering this trend. As the world's two largest democracies, the United States and India can meaningfully partner to shore up democratic resilience in the region. Doing so in close consultation will be more effective than if the United States acted alone.⁶⁹ Building on the December 2021 Summit for Democracy, for example, the two countries can revive the U.S.-India Global Democracy Initiative to drive a new bilateral public-private partnership to strengthen electoral systems, provide legal and technical assistance and training, and support civil society in

Indo-Pacific democracies. These efforts should be aligned with those of the UN Democracy Fund.⁷⁰ The United States and India should also work more closely together in the intergovernmental Community of Democracies by co-chairing the Working Group on Education for Democracy to produce training content and educational materials related to best practices in democracy.⁷¹

Costs, Risks, and Tests of Strategy

This strategy relies heavily on diplomatic engagement, meaning significant person-hours to advocate for and track reforms and to prepare for and participate in meetings and dialogues. This could require additional dedicated staff, especially at USTR, the

U.S. Mission to India, and the U.S. Mission to ASEAN. It also requires high-level commitment and participation in regional meetings by senior U.S. officials, up to and including the President's annual participation in the EAS—something not always prioritized. In terms of budgetary outlays, primary costs include USAID support for basic development assistance and DFC support for private-sector financing, both of which are already accounted for in U.S. foreign affairs budgets and do not require significant expansions. Similarly, military engagements involve activities that are already budgeted, such as exercises and intelligence sharing, but additional staffing resources might be required for dedicated engagement with India.

The United States may face some opportunity and trust-related costs by focusing so heavily on India and the Quad versus devoting resources directly to ASEAN countries, as the latter would prefer, though India and the Quad remain the right choice given ASEAN's current susceptibility to China's influence. Increased focus on and partnership with India will lead to increased yet manageable friction in the U.S.-China relationship. The greatest cost would be not acting at all, which would allow China to grow more influential in the region.

The greatest risk to this strategy lies with India's political will to reform and open its economy, moves that underpin further successes. Pushing India too far too fast, pressing for a military alliance, or suggesting that India's value lies solely as a counter to China could all risk undermining the strategy's broader goals, given India's fierce independence. Domestically, unhappiness in Congress over India's military purchases from Russia and its weak response to the invasion of Ukraine could endanger a sanctions waiver under the Countering America's Adversaries Through Sanctions Act and derail military ties. To mitigate these risks, the United States will need to expend political capital at the highest level and be willing to compromise to goad Modi into continuing reforms. It will also need to encourage India to distance itself from Russia and advocate with Congress regarding India's strategic importance.

The main risk from this strategy is inadvertently driving China to double down on economic self-sufficiency and military expansion by overemphasizing India and the Quad as "counters" to China, a risk that can be mitigated through careful messaging. U.S. opponents of free trade could argue this strategy will cost American jobs by supporting outsourcing to India, which can be countered factually.⁷² Others could argue that supporting defense cooperation with India will accelerate the loss of intellectual property and military secrets; while intellectual property theft remains an issue in India, the country has made progress in recent years, and serious bilateral engagement under the U.S.-India Trade Policy Forum's Working

Group on Intellectual Property restarted in June 2021.⁷³

This strategy passes the standard tests of suitability, feasibility, desirability, acceptability, and sustainability.⁷⁴ In terms of suitability, it directly advances U.S. interests in the Indo-Pacific by offsetting China's coercive behavior, intentionally builds on the principles in the *Indo-Pacific Strategy of the United States*, and draws directly from multiple ongoing lines of effort by U.S. agencies with India, the Quad, and ASEAN. In terms of feasibility, while achieving an enduring economic partnership relies on India's political will to make difficult decisions to reform and open its economy, particularly under Modi, India has expressed a clear desire to work with the U.S. military and to shore up ASEAN and the regional rules-based order. In terms of desirability, this strategy aims to achieve high gains at relatively low cost. To choose not to pursue this strategy's political aim would entail caving to China's demands for regional hegemony and crafting its own rules-based order, at great cost to U.S. prosperity and security—ceding the Indo-Pacific region to China would be the first step in ceding global leadership. In terms of acceptability, this strategy builds on the newly emerged bipartisan agreement on a more competitive approach to China as well as on an enthusiasm for working with India, which has been held by five successive administrations. It is directly in line with long-held U.S. and allied values and views toward the Indo-Pacific, including the important role of democracies, low barriers to trade, and the existing rules-based order, and follows the current U.S. President's policy approach as outlined in the *Indo-Pacific Strategy of the United States*. Finally, in terms of sustainability, while this strategy depends on India's commitment to staying the course of economic reform and opening as well as on U.S. budget support and strategic engagement over at least 10 years, India's concerns with China and U.S. support for India are both likely to continue as key drivers.

Alternative Approaches?

Possible counterarguments to this strategy's recommended approach involve

the choice of partner, the chosen approach to that partner, and the possibility of unintended consequences. One could argue that U.S. efforts to counter China would be better focused on an existing ally such as Japan or on shoring up ASEAN, given India's relations with Russia, its independent viewpoint, and its internal challenges. Japan, while also threatened and motivated by China's behavior, lacks the economic and military heft to counter China and is already unable to stop its aggression in the East China Sea. ASEAN is unlikely to alter its consensus approach, is already divided, and is composed of generally militarily weak states—without the ability to act as one, each of them would be ineffective in countering China.

In terms of working with India, one could argue that this approach relies on India to make economic reforms, about which it will be recalcitrant, whereas an alternate approach might be to focus purely on military cooperation. But India is clear it does not seek an alliance, and its history suggests the United States will be a partner of convenience. Working to grow and open India's economy, though difficult, will pay long-term dividends by creating goodwill based on reciprocal access to the U.S. market and will fund long-term increases to India's ability to project power.

Finally, one could argue that supporting India's rise will only create "another China" down the road. Because India is a democracy that adheres to the rule of law and the rules-based order, this seems unlikely. Moreover, the United States must deal with the threat it faces now rather than over-worry about threats it might face in the future.

Given China's rapid rise and relative power differential in relation to its neighbors, and the concomitant threats to a free, open, and prosperous Indo-Pacific region, no simple solution exists to ensure that international laws, rules, and norms are respected, state sovereignty is secure, and nations pursue economic growth in an environment of fair competition. The United States must follow multiple lines of effort to counter China's coercive behavior, including shoring up the U.S. lead

in innovation and as an economic partner of choice, deepening and expanding alliances and partnerships that have undergirded the region's stability for over 75 years, and preserving a rules-based order that prioritizes justice and equal treatment for states of all sizes over a return to balance-of-power politics. Partnering with India to build an enduring economic relationship that drives growth and supports India's emergence as a net security provider and a key pillar of a democracy-led rules-based order is an essential component to the U.S. approach. JFQ

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Air Force Staff Sergeant Joseph Peralta, 52nd Communications Squadron mission defense team supervisor, identifies indicator of network compromise during exercise Tacet Venari, at Ramstein Air Base, Germany, May 19, 2022 (U.S. Air Force/Jared Lovett)



Transparent Cyber Deterrence

By Ryan Tate

The United States is under constant attack from state-enabled malicious cyber actors. These malicious activities are estimated to cost the U.S. economy as much as \$242 billion annually, according to the U.S. Cybersecurity and Infrastructure Security Agency (CISA).¹ Cyber security company McAfee, in conjunction with the Center for Strategic and Interna-

tional Studies, reported that the majority of cyber attacks on the United States and its allies originate from Russia, China, North Korea, and Iran, whose governments have adopted symbiotic relationships with state and nonstate malicious cyber actors.² The U.S. national cyber strategy calls for deterrence via “the imposition of costs through cyber and non-cyber means.”³ U.S. Cyber Command (USCYBERCOM) has substantial offensive cyber capabilities, but the nature of cyberspace has blurred its contribution to cyber deterrence. Cyber deterrence against determined, resilient, and often profitable actors has remained

elusive. The U.S. Government must consider additional options that directly raise the costs of malicious cyber activities to deter them.

The 2020 Cyberspace Solarium Commission, the Department of State recommendations to the President, and a Department of Defense (DOD) task force all proposed critical actions to attain cyber deterrence. However, fundamental cyberspace challenges, such as attribution and the risk of compromise, impede implementation. General Paul Nakasone, commander of USCYBERCOM and director of the National Security Agency (NSA), stated strategic effects “come

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from the use—not the mere possession—of cyber capabilities.”⁴ Recent uses of offensive cyber capabilities illuminate new options for deterrence. Deterrence is central to U.S. defense strategy, yet malicious cyber actors persist with impunity against the United States. How can offensive cyber capabilities complement cyber deterrence?

Public disclosure is necessary for offensive cyber capabilities to deter

malicious cyber actors, nested with U.S. strategic guidance and achievable based on recent cyberspace operations. Disclosure of the targeted use of offensive cyber capabilities influences the cost-benefit decisions of malicious cyber actors. Use combined with disclosure—transparent cyber deterrence—raises the expectation that malicious actors will face consequences directly affecting them. This concept of transparency shapes

international behavior by deterring the scope and aggressiveness of malicious cyber activities and encouraging like-minded allies to act in kind. Transparent cyber deterrence is based on deterrence theory, intragovernmental and scholarly recommendations for cyber deterrence, and recent U.S. and European cyberspace-enabled reprisals against Russian interference in U.S. elections and global cyber criminals DarkSide, Trickbot, and



Air Force 2nd Lieutenant Alexis Shirley and 2nd Lieutenant Trisha Crisp, 333rd Training Squadron cyber warfare officers, complete cyber tasks in cyber escape room inside Stennis Hall, at Keesler Air Force Base, Mississippi, November 10, 2021 (U.S. Air Force/Seth Haddix)

Emotet. This article examines the strategic problem of malicious cyber activities, a framework for cyber deterrence using offensive cyber capabilities, and U.S. strategic guidance. It then recommends the concept of transparent cyber deterrence and offers a brief analysis of its suitability, acceptability, feasibility, risks, and implications.

The Strategic Problem of Malicious Cyber Activities

State and nonstate actors employ cyber activities for a variety of reasons that ultimately subvert U.S. power and asymmetrically erode U.S. competitive advantages. Emily Goldman argues the United States is facing a crisis, losing ground in cyberspace as the volume, diversity, and sophistication of threats increase and shift from exploitation to disruptive and destructive attacks.⁵ State-enabled malicious cyber activities include espionage of intellectual property, cyber crime to fund illicit activities and degrade competitors, covert influence campaigns, and disruptive attacks on critical infrastructure. General Nakasone summarizes the strategic challenge the United States faces now in cyberspace:

Today peer and near-peer competitors operate continuously against us in cyberspace. These activities are not isolated hacks or incidents, but strategic campaigns. Cyberspace provides our adversaries with new ways to mount continuous, nonviolent operations that produce cumulative, strategic impacts by eroding U.S. military, economic, and political power without reaching a threshold that triggers an armed response.⁶

The proliferation of malicious cyber activity, whether financially or strategically motivated, threatens national interests. According to McAfee, malicious cyber activities cause losses in productivity that undermine national security and damage economies.⁷ Despite advantages across the instruments of power, malicious cyber campaigns constantly undermine and erode U.S. economic and technological competitive advantages. State-enabled

malicious cyber activities range from cyberspace espionage to empowering cyber crime (for example, allowing ransomware operations based in sovereign territory) to disruptive attacks on critical infrastructure and actions that undermine the integrity of democratic institutions and processes. For example, Reuters reported that North Korea used malicious cyber activities to generate funds for its nuclear and missile programs.⁸ The cost-benefit advantages of malicious cyber activities contribute to their prevalence.

Operating costs and risks for cyber actors are low, while payoffs are substantial. British consulting firm Deloitte estimated monthly cyber-criminal operating costs between \$544 and \$3,796.⁹ Conversely, the Federal Bureau of Investigation (FBI) calculated that thefts average \$5,000 per incident.¹⁰ Malicious cyber activity benefits from more than cost efficiency. The design of cyberspace provides five advantages: choice of scale, ability to act from any location, access to tools with desired precision, surprise and reuse inherent in the deception of tools, and the ability to avoid retaliation because of opacity in origins.¹¹ FBI director Christopher Wray stated the United States must “change the cost-benefit calculus of criminals and nation-states who believe they can compromise U.S. networks, steal U.S. financial and intellectual property, and hold our critical infrastructure at risk, all without incurring any risk themselves.”¹² The United States can raise costs for malicious cyber actors directly using offensive cyber capabilities, but influencing actors’ decisions requires a focus on raising their cost expectations.

Cyber Deterrence Framework

Deterrence theory implies that it is possible to deter malicious cyber actors by creating the expectation that retaliatory costs will exceed the benefits of malicious activities. Congressional, State Department, and DOD advisory groups recently published recommendations for cyber deterrence. The 2020 Solarium Commission concluded cyber deterrence requires clear communication of consequences, costs that outweigh perceived benefits, credibility of capability

and resolve, escalation management, the ability to attribute, and a policy for when to “voluntarily self-attribute cyber operations.”¹³ The State Department stressed the need for cyber actors to be certain they will face consequences and the need for public and private communications, improved attribution, direct targeting of cyber actors, and coordinated reprisal with international partners.¹⁴ DOD’s Task Force on Cyber Deterrence proposed deterrence campaigns targeting what malicious cyber actors value. This can be accomplished using multiple instruments of power, communication of the capability and will to respond, and risk management of unintended effects, such as escalation or tool compromise. The task force predicted that this posture would lead to cyberspace norms important for U.S. legitimacy.¹⁵ Government recommendations encapsulate the primary issues debated among scholars.

Scholars debate the feasibility of deterrence in cyberspace and articulate recurrent themes on what cyber deterrence must address. Joseph Nye states cyber deterrence depends on perception, attribution, uncertainty, and escalation risks and should consider entanglement and norms.¹⁶ Will Goodman contends that real-world examples demonstrate cyber deterrence is viable, but challenges include attribution, anonymity, scalability, reassurance, escalation, and clear signaling.¹⁷ Conversely, Michael Fischerkeller and Richard Harknett argue that the uniqueness of cyberspace makes deterrence unfeasible below the use-of-force threshold, theorizing that continuous interactions encourage stable competition.¹⁸ Mariarosaria Taddeo reasons deterrence is limited by the nature of cyberspace regarding attribution, credible signaling, escalation, uncertainty of effects, and proportionality.¹⁹ Attribution, credibility, clear communication, scalability, environmental uncertainty, misperceptions, escalation, risks of compromise, unintended effects, and the question of norms are themes pervading scholarly debate. The intersection of government and scholarly recommendations informs a useful framework.

Effective deterrence requires capability, credibility, and communication. Capability is the power to project targeted, proportionate, and scalable cyberspace effects of significant cost. Credibility means malicious cyber actors believe the capability and the resolve to use it exist. Communication is the mechanism to clearly signal intent to impose consequences for specific malicious cyber activities for target audiences including cyber actors as well as allies and partners.

Critical enabling capabilities include attribution, intelligence, and operations capacity. Attribution is the ability to trace malicious cyber activities to an actor sufficiently to enable targeted reprisal, despite obfuscation or anonymity in cyberspace. Intelligence enables cyberspace attribution, assessment of effects and reactions, and identification of cyber actor interests and perceptions. Avoiding attribution and, therefore, retribution is key for malicious cyber actors to preserve favorable cost-benefit tradeoffs for cyber activities. Operations capacity is the ability to appropriately employ capabilities with communication, influencing malicious cyber actors' decisions while mitigating risk and building legitimacy.

The primary risks of cyber deterrence are compromise, unintended effects, and escalation. Compromise is the unintended disclosure of sensitive cyber capabilities and vulnerabilities or intelligence sources and methods. The inherent uncertainty and volatility of cyberspace make operations susceptible to unpredictable effects and to ambiguity and manipulation of perception. Escalation includes unintended responses that intensify conflict. Transparent cyber deterrence must address all these factors to raise expected costs for malicious cyber actors while supporting U.S. strategy.

A Strategic Approach

U.S. national security prioritizes deterrence.²⁰ President Joseph Biden's guidance is to hold malicious cyber actors accountable with proportionate costs and, along with allies and partners, to shape global cyberspace norms.²¹ The 2018 National Cyber Strategy,

issued under President Donald Trump, pursues deterrence "in concert with allies and partners—to deter and, if necessary, punish those who use cyber tools for malicious purposes" and includes criteria for "consensus on what constitutes responsible state behavior in cyberspace" and "consequences for irresponsible behavior." It states:

*All instruments of national power are available to prevent, respond to, and deter malicious cyber activity against the United States. This includes diplomatic, information, military (both kinetic and cyber), financial, intelligence, public attribution, and law enforcement capabilities. The United States will formalize and make routine how we work with like-minded partners to attribute and deter malicious cyber activities with integrated strategies that impose swift, costly, and transparent consequences when malicious actors harm the United States or our partners.*²²

Transparent cyber deterrence must enable an evident system of U.S. allies and partners that imposes proportionate consequences on malicious cyber actors to shape global norms in cyberspace.

The United States has imposed swift, costly, and transparent consequences outside of cyberspace for malicious cyber activities. The Department of Justice recently announced an indictment of four Chinese nationals for malicious cyber activities targeting the United States and its allies.²³ The Department of the Treasury retaliated for the SolarWinds attack in 2020 with broad financial prohibitions on specific Russian companies and individuals.²⁴ Reprisals against cyber-enabled interference in the U.S. elections include criminal indictments and economic designations against Russia's Internet Research Agency, revealing 15 names and specific activities.²⁵ U.S. economic and legal reprisals divulged surprising details on the identities, companies, and activities of malicious cyber actors.²⁶ This suggests that, without compromising sensitive intelligence, the United States can declassify and release sufficient information to attribute malicious cyber actors

and describe their activities publicly. Yet there remain few public details of USCYBERCOM's offensive actions to impose costs on malicious cyber actors.²⁷

USCYBERCOM is able "to compete with and contest adversaries globally, continuously, and at scale."²⁸ In 2018, National Security Advisor John Bolton confirmed the United States was conducting offensive cyber operations to defend the integrity of U.S. elections.²⁹ General Nakasone's 2019 statement to the Senate Armed Services Committee explained that USCYBERCOM imposed costs and "changed [Russia's] risk calculus for future operations."³⁰ The Director of National Intelligence declassified intelligence describing Russia's malicious activities in 2018 to influence U.S. public perceptions, assessing Russia "did not make persistent efforts to access election infrastructure, such as those made by Russian intelligence during the last U.S. presidential election."³¹ A DOD news story reported that USCYBERCOM conducted more than 2,000 operations defending the 2020 elections.³² The public record indicates U.S. cyber capabilities deterred malicious cyber activities in defense of recent U.S. elections, but details remain classified—along with their deterrence impact.

In contrast to announcements from Justice and Treasury, there is insufficient detail to understand the impacts and targets of USCYBERCOM offensive cyberspace operations. One reason to limit transparency is to minimize the chances of revealing intelligence or capability. But limited transparency also restricts the information malicious cyber actors need to recognize the threat that U.S. cyber capabilities pose to their interests. Despite their secrecy, USCYBERCOM operations offer two important observations. The first is that USCYBERCOM can deliver cyber effects using offensive cyber capabilities with acceptable risk to tools or methods. The second is that USCYBERCOM can generate numerous options to impose costs on malicious cyber actors—in other words, it can conduct offensive cyberspace operations at scale. Given such a capability, how important is transparency?



Senior Airman Robert Sleme, 62nd Cyber Squadron capabilities development manager, ensures hardware capabilities for classroom training usage on Buckley Space Force Base, Colorado, November 29, 2021 (U.S. Space Force/Andrew Garavito)

Transparency provides the communication required for successful deterrence. Public disclosure attributes specific malicious cyber activities and their consequences. This communicates a credible threat of direct reprisal in cyberspace for unacceptable behavior. It demonstrates the U.S. ability to impose significant costs on malicious cyber actors and the resolve to respond to *certain* malicious activities. This concept leverages deterrence theory and both government and scholarly recommendations. With consistency, transparent cyber deterrence will build legitimacy and shape global norms consistent with U.S. strategic guidance.

Transparent Cyber Deterrence

Transparent cyber deterrence combines the use of cyber capabilities with disclosure (that is, transparency) in the form of post factum public announcements stating the activities that elicited reprisal, specific targets with their justification, and the effects of the operation. Offensive cyberspace operations targeting malicious actors' cyberspace assets (for example, digital infrastructure and accounts) impose costs that directly influence the cost-benefit balance of malicious cyber activity. Disclosure exchanges some information to buy credibility in capability and will. This approach affords the ability to

minimize compromise, escalation, and misperception and to consider information trade-offs prior to operations. Cyberspace effects alone marginally influence cyber actor decisionmaking because of the limited observability inherent in cyberspace.

Disclosing cyberspace effects unambiguously communicates capability with intent and generates the expectation of costs for multiple actors. Transparency also builds legitimacy, documenting proportionate targeting of specific actors for their activities. Consistent reprisal for specific activities threatening national interests, such as critical infrastructure, communicates which activities are



Senior Airman Icy Walley, 919th Special Operations Communications Squadron radio frequency technician, connects antenna cable to high-frequency whip antenna at Duke Field, Florida, November 7, 2021 (U.S. Air Force/Michelle Gigante)

unacceptable. Cyberspace reprisals are unlikely to deter all malicious activities, such as cyberspace espionage. Disclosure is essential to demonstrate legitimate reprisal for unacceptable activities, shape international norms, and ensure deterrence credibility.

Analysis

The capability, credibility, and communication of transparent cyber deterrence enable a transparent system of U.S. allies and partners that imposes proportionate consequences on malicious cyber actors to shape global cyberspace norms. An analysis of the suitability,

acceptability, feasibility, and risk shows that transparent cyber deterrence can be effective. Suitability analysis explores how capability, credibility, and communication achieve a transparent system of U.S. allies and partners imposing proportionate consequences on malicious cyber actors to reinforce and shape global norms in cyberspace. Acceptability analysis focuses on the risks of compromise, unintended effects, and escalation and conformance to ethical principles and partnership practices. Feasibility analysis evaluates the ability of USCYBERCOM to meet the requirements of attribution,

intelligence, planning, and execution of transparent, persistent operations. It mitigates risks of compromise, unintended effects, and escalation and is well suited ethically to interagency and international partners and to USCYBERCOM's attribution, intelligence, and planning abilities.

Suitability. Offensive cyber capabilities can impose costs that reverse the cost-benefit balance of malicious cyber activities. CISA estimated that median per-incident cyber damages range from \$56,000 to \$1.9 million when including immediate expenses, lost revenue, and business disruptions.³³ Costs at this scale

convert most malicious cyber activities into financial losses.³⁴ General Nakasone lauded USCYBERCOM's ability to degrade malicious cyber actors and achieve decisive results.³⁵ Cyber attacks disrupt operations, impose direct damages, compel expensive recovery and replacement, and damage reputations (for example, forcing cover-ups). But what matters for deterrence is setting the expectation of facing those consequences.

FBI and Europol announcements accompanied their recent cyberspace operations neutralizing malicious cyber activities. A 2020 cyberspace operation disrupted Trickbot, a "top-tier" cyber criminal active since 2016.³⁶ Researchers reported a 68 percent reduction in Trickbot activity but assessed that the effects would be temporary and that lasting deterrence would require targeting digital infrastructure combined with releasing information about the actors.³⁷ In January 2021, Europol announced actions in eight countries, severely disrupting the cyber infrastructure of Emotet, an actor behind the 2020 targeting of U.S. state and local governments.³⁸ Researchers assessed an 80 percent reduction in infections and unprecedented adjustments as Emotet became "pickier about who they target."³⁹ In April 2021, the FBI announced that a cyber operation recaptured \$2.3 million in cryptocurrency directly from DarkSide shortly after the Russian cyber criminal's ransomware attack against Colonial Pipeline.⁴⁰ Reportedly, DarkSide suffered infrastructure disruption and announced it would avoid public targets as affiliates distanced themselves.⁴¹ Trickbot, Emotet, and DarkSide later demonstrated resilience in various degrees, but law enforcement actions reduced the scope and scale of post-recovery activities. These cases illustrate how transparently striking back in cyberspace directly imposes costs on cyber actors' assets and influences multiple actors' decisions. Stronger deterrence requires costs that exceed temporary disablement. USCYBERCOM can impose such costs and, when combining them with transparency, raise the expected costs of

targeted malicious activities for actors who have benefited from years of success and state protections.

Transparency must overcome the uncertainty, anonymity, and obfuscation inherent in cyberspace. Research on emerging military technologies with limited observability suggests capability employment is the most unambiguous way to signal a threat.⁴² The use of offensive cyber capabilities demonstrates skill while public disclosure overcomes perception challenges. Publicity establishes a credible threat to other actors, creates reputational costs, and reduces the chance for successful downplay, denial, or manipulation of events.⁴³ Publicizing a firsthand accounting of cyber reprisal links consequences to specific malicious activity and promotes desired norms.

Transparent cyber deterrence shapes global cyberspace norms, which are common expectations about acceptable behavior. The World Bank reports that voluntary government alliances develop global norms by bringing issues into public discourse when there is strong leadership, accountability, and legitimacy.⁴⁴ Relevant and credible evidence is key to building acceptability and support.⁴⁵ Public disclosure provides a transparent accounting of consequences and malicious activities, enabling global discourse on unacceptable behaviors and what constitutes legitimate reprisal. In his remarks to the European Union in 2019, Christopher Ford, Assistant Secretary of State for International Security and Nonproliferation, explained:

*Normative understandings can help anchor the policy choices of responsible states in responding to bad behavior in cyberspace—which is what normative regimes do by way of compliance enforcement. This issue of consequences is an emerging area of cooperation between like-minded states, one that is called for in our National Cyber Strategy.*⁴⁶

Disclosure demonstrates the acceptable use of offensive capabilities for deterrence, encouraging like-minded partners to contribute in kind.

The transparency of the Trickbot and Emotet operations led to formulations

of voluntary alliances imposing consequences. Microsoft coordinated with global telecommunications providers, securing court orders for additional Trickbot disruption.⁴⁷ Europol's Emotet reprisal exemplified a security community raising costs through cyberspace operations, law enforcement, and public announcements across eight countries. In his study on deterrence and cyberspace norms, Tim Stevens argues that norms-based "deterrence communities" increase the chance of deterrence and encourage the exercise of power when it serves material interests.⁴⁸ Stevens adds that global normative frameworks not backed with coordinated and credible force fail to deter nonstate actors who are the most likely to conduct malicious cyber activities.⁴⁹ The United Nations Group of Governmental Experts in Information and Telecommunications Security concluded:

*Voluntary, non-binding norms of responsible State behaviour can reduce risks to international peace, security and stability. . . . Norms reflect the expectations of the international community, set standards for responsible State behaviour and allow the international community to assess the activities and intentions of States.*⁵⁰

Publicly holding malicious cyber actors accountable facilitates cooperation from like-minded partners and an international system that curbs unacceptable behavior, cumulatively raising costs for malicious cyber actors. The United States can impose significant consequences with offensive cyber capabilities and translate those actions into deterrence with public disclosure to shape global norms.

Acceptability. It is possible to disclose the impact of an offensive cyber operation and release intelligence regarding targets without compromising methods or information. Conventional thinking is that disclosure compromises sensitive capabilities. However, FBI, Europol, and Treasury Department announcements demonstrate disclosing costs imposed with specific targets can satisfy public attribution and legitimacy requirements while protecting methods

and sources. Also, the volume of operations USCYBERCOM conducted defending the U.S. elections indicates the ability to deliver substantial effects without compromising capabilities. Last, post factum disclosure may reveal little more than the intelligence and access that are inherently compromised with a cyber strike. Transparency enables additional risk mitigation.

Transparency mitigates the risks of unintended effects from the uncertainty and limited observability in cyberspace. Disclosure communicates directly to target audiences the intended effects, targets, and actual outcomes and which activities provoked reprisal. Consistent justifications, as the FBI demonstrated, reduce uncertainties regarding intentions and thereby reduce risks of escalation. One concern with disclosure is that it risks accusations of misattribution or retaliation for reputational costs, in which case limited or private messaging may be more appropriate. However, Fischerkeller and Harknett contend that fears of escalation are unwarranted because malicious cyber activities already challenge national security and cyberspace competitive interaction stabilizes rather than escalates risk.⁵¹ U.S. actions during the Cold War suggest that creative uses of the military send strong signals that are not inherently escalatory.⁵² Disclosing information helps ensure that observers have sufficient data to assess U.S. actions, including evidence of the justification, targets, and actions that reduce opportunities for misrepresentation.

Transparent cyber deterrence upholds the Law of Armed Conflict principles of necessity, proportionality, and distinction, while ensuring that proper coordination and planning will protect partner interests. It is possible to conduct a cyberspace attack on cyber actors' logical assets while eliminating collateral damage to legitimate but unwitting host services. For example, FBI and Europol operations remediated bot access, freeing users' devices from malicious control without harming their hosts. Close coordination with law enforcement will remain fundamental in ensuring compliance with international law regarding third parties. Finally, USCYBERCOM operates closely

with interagency partners to vet targets and review intelligence equities before releasing any information, minimizing unintended effects. Transparency also encourages international partners to assess reprisals and fosters their adoption of international norms.

Feasibility. USCYBERCOM and its components provide sufficient capability to project targeted, proportionate, and scalable cyberspace effects of significant cost to malicious cyber actors. Its offensive teams degrade, disrupt, destroy, or manipulate adversary information, information systems, and networks.⁵³ The command operates a cyber mission force of 6,200 Servicemembers, including offensive forces organized in cyber national mission teams and cyber combat mission teams.⁵⁴ It also has multiple subordinate operational headquarters.⁵⁵ Additionally, USCYBERCOM is collocated with NSA and draws from the resources of the U.S. Intelligence Community to support messaging, effects, and attribution.⁵⁶ Public disclosure of USCYBERCOM operations may require a modest increase in personnel to plan and coordinate information release.

With these resources, USCYBERCOM is well positioned to deter malicious cyber actors. Michael Warner provides a brief overview of the command's offensive capabilities, from disruption of social media from the so-called Islamic State in 2016 to a "new level" in scale and scope targeting actors interfering in the 2018 elections.⁵⁷ Actions defending the U.S. elections in 2018 and 2020 demonstrate the ability to attribute malicious cyber activities and execute at scale.⁵⁸ General Nakasone affirmed USCYBERCOM's ability to impose tailored costs on malicious cyber actors.⁵⁹ In summary, USCYBERCOM has the planning, intelligence, and teams capable of generating a range of effects suitable for imposing proportionate consequences and the resources to attribute malicious cyber activities.

Risk. Public disclosure reduces the previously discussed risks of compromise, unintended effects, and escalation. There is also risk of underproducing the declassified intelligence or effects options

for reprisal. Early planning for public disclosure in most offensive cyberspace operations will maximize future options. A campaign of targeted reprisal actions will afford the best opportunity to exceed the cost-benefit thresholds of resilient malicious cyber actors. While this will require significant resources, even periodic demonstrations can shape adversary decisionmaking. Finally, interagency coordination to mitigate intelligence equities and political-military risk will remain an important requirement. Ultimately, greater risk lies in allowing malicious cyber actors to continue their activities undermining the U.S. economy.

Implications. Law enforcement and economic actions are powerful but fail to impose high enough costs to deter malicious cyber actors, particularly for actors beyond jurisdictional reach. The FBI and Europol demonstrated consequences for major ransomware operations with public announcements detailing tangible costs and specific intelligence on malicious cyber actors. They leveraged successful multinational, public-private deterrence communities targeting cybercriminals without compromising sensitive intelligence or capabilities. Yet cybercriminals continue to make fortunes and benefit from state support, building resiliency and learning to hide from the law. Malicious cyber activities targeting critical infrastructure and other interests of national security demand higher consequences.

U.S. military cyberspace operations should respond to unacceptable malicious cyber activities by imposing dramatic countervailing costs directly on actors' cyberspace assets. Such actions would send a strong message that conducting malicious cyber activities threatening national and allied interests is not cost-effective. USCYBERCOM efforts should complement legal and other countermeasures, target the most significant malicious cyber actors, and significantly deepen costs (that is, exceed disablement) for activities threatening critical infrastructure, elections, or other national interests. Transparent cyber deterrence is essential to take back the offensive advantage in cyberspace.



Senior Airman with 103rd Air Control Squadron works as his Blue Team's communication liaison during Cyber Yankee 2022, in Niantic, Connecticut, June 16, 2022 (Air National Guard/David Pytlik)

Transparent cyber deterrence creates opportunities to secure advantages in the information environment. Using offensive cyber capabilities to impose consequences in an appropriate, transparent manner exploits the relative advantages of offense in cyberspace, compelling targets to defend everywhere and discouraging other malicious cyber actors. Disclosure seizes the initiative, setting the narrative of legitimate reprisal. It provides a public account of U.S. actions with evidence that malicious cyber actors must refute. Publicity reduces actors' abilities to construct alternate stories and downplay consequences. The costs of reprisal can be significant, as discussed, and portend substantial second-order effects from

ensuing investigation and remediation. Offensive cyber capabilities are the means to impose costs on actors less susceptible to diplomatic, law enforcement, or economic actions. Additionally, consistency in public disclosure provides the ability to privately message some adversaries when it is crucial to demonstrate restraint or retain the option to escalate reputational costs. Furthermore, transparency encourages like-minded allies to reinforce acceptable behavior in cyberspace. This will create a deterrence community with the resolve and capability to raise costs for malicious cyber actors.

Conclusion

Malicious cyber actors operate with impunity, enjoying the low-cost benefits

of cyberspace and often state support. The cumulative effects of malicious cyber activities already threaten national security. Malicious cyber activities targeting national interests, such as critical infrastructure, demand higher consequences. Strategist B.H. Liddell Hart stated, "It is folly to imagine that the aggressive types, whether individuals or nations, can be bought off . . . but they can be curbed. Their very belief in force makes them more susceptible to the deterrent effect of a formidable, opposing force."⁶⁰ Offensive cyber capabilities are the means to impose costs on actors that are increasingly resistant to diplomatic, legal, or economic instruments. Using offensive cyber capabilities, the United States can alter the cost-benefit

decisions of such actors while shaping international norms.

Recent cyberspace operations suggest the United States can positively attribute malicious cyber activities, impose significant consequences with offensive cyber capabilities, and translate those actions into deterrence with calculated public communication. Transparent cyber deterrence combines transparency with the use of offensive cyber capabilities to impose dramatic costs on actors undertaking unacceptable activities. It exploits the relative advantages of offense in cyberspace to compel reprisal targets to defend everywhere while publishing evidence of the consequences, actors, and their activities. Such evidence would be difficult to ignore and would influence the cost-benefit decisions of other actors. The expectation of costly reprisal is what is required to deter the scope and aggressiveness of malicious cyber activities.

Transparent cyber deterrence implements U.S. strategic guidance, leverages disclosure to maximize deterrence credibility while minimizing the risks inherent in cyberspace operations, and shapes cyberspace norms. The United States must demonstrate offensive cyber capabilities to influence the cost-benefit decisions of malicious cyber actors. A transparent approach would also advance discourse among allies, promote international norms, and force strategic dilemmas on malicious cyber actors and their enablers who seek cost-effective strategies to attack the United States, its allies, and its partners. JFQ

Notes

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Army Lieutenant Colonel Katherine Hetz (right), general surgeon, with Charlie Company, Brooke Army Medical Center, and Ghanaian army nurse assess patient during surgical procedure at 37th Military Hospital, in Accra, Ghana, June 14, 2022, as part of medical readiness exercise during African Lion 22 (U.S. Army/Ethan Ford)

Health Diplomacy

A Powerful Tool in Great Power Competition

By Kimberly Sandberg, Kevin Pickard, Jr., Jay Zwirblis, and Speight H. Caroon

Today, China is looking to compete with the United States for influence and access across Africa. Policy experts within the

Captain Kimberly Sandberg, USN, Captain Kevin Pickard, Jr., USN, Lieutenant Colonel Jay Zwirblis, USAR, and Lieutenant Colonel Speight H. Caroon, USAF, wrote this essay while attending the Joint and Combined Warfighting School at the Joint Forces Staff College, in Norfolk, Virginia. It won the Strategy Article category of the 2022 Chairman of the Joint Chiefs of Staff Essay Competition.

Department of Defense have focused on China's effort to reach parity with the United States within traditional military domains; however, they have contributed less regarding the military policy implications of China's expansion of medical and pharmaceutical assistance, an area that likely will continue to be a key line of operation in the post-pandemic world.

In its purest form, *health diplomacy* has been characterized as a moral

imperative that carries the obvious benefit of building trust and amity that can be leveraged to develop mutually beneficial partnerships. The 2021 Interim National Security Strategic Guidance (INSSG) emphasizes continued partnership developments in Africa by investing in civil society and strengthening longstanding political, economic, and cultural connections. It also highlights the need for global partnerships to achieve national security objectives, specifically, the

need to strengthen health diplomacy to combat instability in Africa.¹ While the motivations behind China's efforts to expand health diplomacy are not entirely clear, this guidance suggests that it cannot be viewed as a purely altruistic effort to better the lives of Africans, but remains a deliberate, and not necessarily new, component of China's continuing efforts to expand its influence. Understanding Chinese health diplomacy and methods used, U.S. goals for Africa, and our strengths will help to provide policy prescriptions for U.S. Africa Command (USAFRICOM) to reinforce the INSSG and the role of the United States as the partner of choice in Africa.

Health Diplomacy and Chinese Foreign Policy

The Chinese Communist Party has significantly invested in health diplomacy since “the 1950s and ’60s, [when] a still-impoorished China sent a total of 6,500 trained medical personnel on assistance missions to over 40 countries and funded the construction of more than 20 medical institutions around the world.”² China's efforts to contain its domestic outbreak of the hepatitis B virus in the 1980s and its response to the SARS (severe acute respiratory syndrome) outbreak in 2003 point to China's inability to mount a successful domestic response to a health emergency and highlighted an unwanted reliance on Western pharmaceutical capacity and medical technology.³ With the COVID-19 pandemic, China's renewed emphasis on displaying competence within the health and pharmaceutical industries has created a fertile ground for it to generate greater international goodwill while seeking to portray itself as a country whose political governance is superior to Western democracy.⁴

Recently, China has made efforts to provide high-visibility aid that exemplifies both its benevolence and largesse. At the beginning of the COVID-19 pandemic, it rapidly sent 5.4 million facemasks, more than 1 million test kits, and thousands of protective suits to African countries.⁵ It also sent medical teams to several African countries to

combat the pandemic. The primary beneficiaries of China's medical diplomacy efforts have been poorly governed countries in Africa.⁶

Assistance was provided through multiple channels, including Chinese state-owned enterprises (SOEs) and private entities.⁷ According to R. Maxwell Bone and Ferdinando Cinotto, “SOEs tend to target institutions which they intend to do business with directly, while private companies aim their donations toward both central governments and consumers.”⁸ Chinese SOEs are usually considered an extension of the central government, but they often operate semi-autonomously and under the looser regulatory frameworks of developing countries. PalmPay, an Africa-focused mobile payment startup backed with funding from Transsion Holdings (a major Shenzhen-based cellphone maker), waived transfer fees and even gave direct “cash” handouts to customers hit by COVID-19.⁹ These efforts produced results. In a Pew research survey that focused on public opinion of the United States in 13 countries in North America, Europe, and the Asia-Pacific region, China's response to the pandemic received better reviews than the U.S. response.¹⁰

Health Diplomacy and U.S. Foreign Policy

The recently released INSSG places a renewed emphasis on global health security and specifically addresses the need to bolster the commitment to mutual health security. It calls for deeper engagement in Africa and stresses that the United States should “continue to build partnerships in Africa . . . even as we provide assistance to countries suffering from poor governance, economic distress, health, and food insecurity exacerbated by the pandemic.”¹¹

In response to the pandemic, the United States allocated \$20.5 billion for the development of vaccines and therapeutics, preparedness efforts, and other foreign assistance. Additionally, the U.S. Government allocated more than \$1.6 billion in Department of

State and U.S. Agency for International Development (USAID) emergency health, humanitarian, economic, and development assistance aimed at helping governments, international organizations, and nongovernmental organizations fight the pandemic.¹² In alignment with the INSSG, 30 percent of U.S. global funding aid for COVID-19 was directed to Africa, including Ethiopia, Nigeria, South Sudan, and Sudan, and approximately \$500 million was allocated to Africa to respond to the global pandemic. Although less publicized than China's efforts, American private businesses, non-profit groups, charitable organizations, faith-based organizations, and individuals provided more than \$4.9 billion in donations and assistance globally for COVID-19 response—more than any other nation.¹³

Working in collaboration with other governmental, nongovernmental, and international organizations, USAFRICOM strove to maintain security; provide logistical support for food, medicine, and other commodities; maintain communications; and provide augmented medical care.¹⁴ USAFRICOM contributed to the building of several United Nations (UN) hospitals and field hospitals. To date, USAFRICOM has provided COVID-19 assistance to 43 countries, including the delivery of nearly \$500 million in medical supplies.¹⁵ Despite these efforts, the initial response by the United States was seen as less successful in the public eye. In that same Pew survey of 13 advanced economies, 15 percent of those surveyed thought the United States had done a good job of handling the pandemic, while 85 percent had a negative or neutral view.¹⁶

USAFRICOM and Continued Health Diplomacy

Without additional U.S. engagement and leadership in the healthcare realm to serve as a counterpoint to China, U.S. influence in Africa will continue to diminish and lead to significant political instability, dramatic humanitarian challenges, and an erosion of U.S. influence on the world stage. Former UN Ambassador and current administrator

of USAID Samantha Power argued that “the coronavirus pandemic provided just such an opening. By spearheading global vaccine distribution, the United States could beat China at the biggest soft-power contest in generations, regain its reputation as the world’s ‘indispensable’ nation and, not incidentally . . . do good.”¹⁷

Global health diplomacy will continue to be a crucial tool for U.S. foreign policy and will need to be a key effort of USAFRICOM’s operational and

strategic approach. To effectively counter Chinese health diplomacy efforts, USAFRICOM must first recognize a key component of the INSSG: an emphasis on the need to strengthen health diplomacy to combat instability in Africa.¹⁸ While certainly one must be wary, the United States and USAFRICOM should recognize that not all Chinese aid is necessarily counterproductive to stated U.S. objectives and should look for opportunities to cooperate and not undermine compatible Chinese efforts.

USAFRICOM must be able to support partner nations with better alternatives and products. A recent example of USAFRICOM’s use of partnerships to build partner capacity is Obangame Express, an annual naval exercise including the United States and multiple West African nations. Part of the exercise focused on training for and preventing outbreaks onboard ships.¹⁹ While large responses will be necessary, dedicated small engagements such as Obangame Express, which bring multiple nations



U.S. Sailors observe Senegalese sailors during medical training onboard Senegalese navy's patrol ship *Fouladou* as part of exercise Obangame Express, in Dakar, Senegal, March 14, 2022 (U.S. Navy/Peter Ticich)

together to work toward a common utilitarian good, can not only help prevent a health emergency but also provide that qualitative difference for our African partners. The United States has developed logistics capability, training, communications, and command and control over decades of partnership with African nations. It is in these areas that the United States and USAFRICOM have a distinct advantage and must look to leverage and align to a broader health strategy. JFQ

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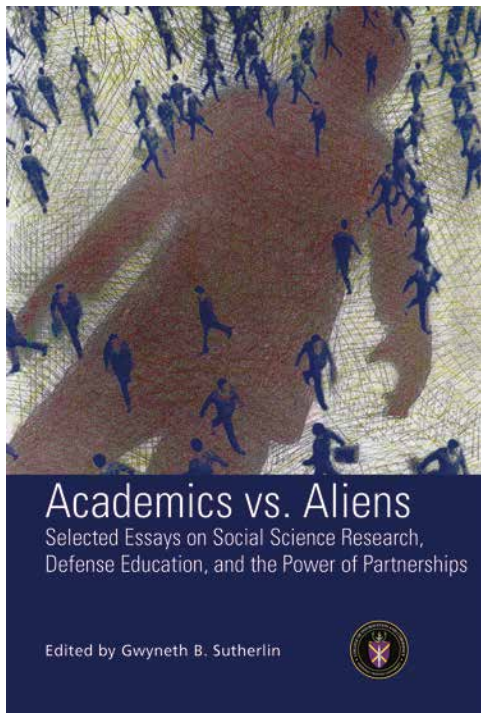
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New from NDU Press for the College of Information and Cyberspace

Academics vs. Aliens: Selected Essays on Social Science Research, Defense Education, and the Power of Partnerships

Edited by Gwyneth B. Sutherland

This edited volume shares the experience of the first students and partners in the Minerva Defense Education Civilian University Research Partnership (DECUR) program. Their reflections offer a unique perspective on the collaborative approach for basic social science research. The National Defense University deliberately placed professional military education students at the center of the research design in partnership with technical experts and asked them to consider what role research can plan in national security and education. The approach challenged preconceived notions about academia, military, and government perspectives, leading to improved communication of priorities and knowledge as well as more relevant solutions to the topic of “Understanding Chinese Influence.”



General Jacqueline D. Van Ovost is Commander of U.S. Transportation Command (DOD)

An Interview with Jacqueline D. Van Ovost

JFQ: How has the shift in national guidance toward pacing and other threats to our country, allies, and partners impacted the focus of your command?

General Jacqueline D. Van Ovost, USAF, is the 14th Commander of U.S. Transportation Command.

General Van Ovost: The character of war is changing, and our nation faces direct challenges across all domains, including daily adversarial activity in the cyber realm. From competition to conflict, these changes drive accompanying shifts in how U.S. Transportation Command is approaching the applica-

tion of our global logistics capability. From ensuring the joint force can defend our homeland, support our allies and partners, protect our interests abroad, deter potential adversaries, and transport combat power to prevail, this command stands ready to deliver.

As an enterprise, we are the engine that propels the National Defense Strategy by underwriting the lethality of the joint force and ensuring the viability of deterrence options, providing our national leadership with strategic flexibility. Integrated deterrence relies on the ability to maneuver credible forces to their point of need. USTRANSCOM's global posture sets conditions to enable their desired application. This begins at home, with a robust and resilient national transportation infrastructure and stretches around the world to our allies and partners who provide the necessary access, basing, and overflight to ensure our freedom of maneuver. When combined with our incredible industry partners that provide scalable capacity and access to global transportation networks, we provide a true asymmetric and strategic advantage for our nation.

While we have had great success over our 35-year history as a combatant command, we know we must continue to innovate and accelerate the changes necessary to remain ready now and into the future. We have sharpened our focus on air and maritime fleet recapitalization and modernization, along with new concepts of operation to ensure we can deploy rapidly in a contested environment. We are exercising with our allies and partners as well as industry to enhance our logistics networks and increase interoperability—for example, building partner capacity to move cargo and repair aircraft and, for our industry partners, providing mariner training in underway replenishment and tactical maneuvering.

Building enduring advantages begins by addressing critical vulnerabilities. Investing in and hardening a resilient defense ecosystem will strengthen our commercial and military transportation networks and create advantages across multiple domains, especially space and cyber. We expect disruption in our

operations and are focused on cyber-mission assurance and digital modernization to ensure our ability to conduct globally integrated C2 [command and control] and generate decision advantage. With significant volumes of data and advanced analytics, we can posture efficiently, recover quickly, and accelerate the application of our capacity.

Finally, people are our most valuable resource and will make the difference between victory and defeat. We continue to develop our warfighting team with a competitive “fight tonight” mindset, acknowledging the challenges present today. By embracing the imperative to be ready now and into the future, our people understand the mission and are continually adapting to maintain our nation’s competitive advantage in power projection.

***JFQ:** Given the constant calls on your command to respond through warfighting demands, do you have all the capabilities you need, looking as far in the future as you can? In what areas of capability are you most concerned?*

General Van Ovost: The purpose of USTRANSCOM is to project and sustain the joint force at a time and place of our nation’s choosing. The speed and reliability at which we can execute our diverse mission sets demonstrate our resolve and influence the decision calculus of our adversaries. To talk about capabilities for today, and for the future, let me start by discussing our Warfighting Framework, which is the synchronization of three elements: our global mobility posture, capacity, and global command, control, and integration.

Our adversaries look to degrade our power projection capabilities. During my testimony to Congress, I explained that we must continually assess and refine our posture to meet the evolving geopolitical landscape and focus on strengthening and diversifying our infrastructure and agreements to maintain this advantage. Global mobility posture is the foundation of our ability to project power. It

starts here at home, with the installations and infrastructure, such as ports, highways, and railways, to mobilize and deploy forces. The ability to leverage a distributed and scalable logistics network is highly dependent on our deep bench of diplomatically aligned allies and partners. Their support, garnered through diplomacy and geographic commander relationship building, secures the critical access, basing, and overflight that enable our freedom of maneuver around the world. This is one of our greatest strategic advantages. With our posture secured, USTRANSCOM can bring our considerable mobility capacity to bear.

As recent events have demonstrated, our capacity is inextricably linked to our commercial partners and the Total Force. This applies to both daily capacity and the ability to seamlessly transition to a wartime footing where volunteerism and early access authorities become critical. With about 85 percent of the joint force residing in the continental United States [CONUS], airlift, sealift, rail, road, air refueling, and port capacity are vital for throughput. Without credible, survivable, and agile capacity, we run the risk of not being able to maneuver the force in time to deter or prevail.

The most recent Mobility Capability Requirements Study found our current mobility capacity sufficient but at increasing levels of risk due to the focused efforts of our adversaries, coupled with the erosion of readiness in key mobility capability areas. My biggest concerns in this area are sealift and air refueling.

Sealift is vital to delivering decisive force; in times of war, 90 percent of military cargo is transported in this manner. In 10 years, approximately 70 percent of U.S. Government-owned surge sealift ships, which are critical to these movements, will reach the end of their life. Working with the [U.S.] Maritime Administration, we have begun a sealift recapitalization program under which we have completed the purchase of two used vessels, but the process must be accelerated if we are to keep pace with the retirement schedule. Additionally, we have been taking steps to address the DOD shortfall in meeting wartime fuel delivery

demands and the continued reliance on the use of foreign flag tankers. Congress recently approved the Tanker Security Program, which will bolster our ability to conduct sustainment operations at sea. This capability is critical when we consider a theater such as USINDOPACOM [U.S. Indo-Pacific Command].

The air refueling fleet is key to rapid global mobility and the lifeblood of our ability to deploy and employ the immediate force. When the last KC-46 is assessed into the Air Force, the average age of the remaining KC-135s will be 67 years old, with the commensurate readiness concerns that brings. It is critical that the Air Force continues a full recapitalization program to maintain credible capability.

Finally, the evolving ability of peer adversaries to interdict our logistics capabilities across all domains presents considerable challenges, especially for global command, control, and integration. We expect that the flow of goods and services (and our supply chain) will be disrupted or degraded. We must rethink how we maneuver combat power and logistics across a vast theater of operations. Integration of logistics planning and execution with all joint warfighting functions is essential for success, as we operate against adversaries capable of affecting both our systems and networks and those used by our commercial partners.

***JFQ:** In your testimonies from your confirmation to this year’s posture hearings, you mentioned cyber threats to USTRANSCOM, particularly in the C2 area. How is your team progressing in addressing this set of threats?*

General Van Ovost: Global command, control, and integration remains central to being able to align scarce mobility resources to our highest strategic priorities. The ability to command and control is enabled by a portfolio of IT systems and relies on secure networks, making cyber domain mission assurance one of my top priorities.

When we hear the term cyber security, the first thing we usually think



about is technology because it is the most tangible. We are pursuing several technological initiatives to harden our terrain and improve our ability to continuously monitor for, and detect signs of, unusual activity. The biggest change we are making is moving to Zero Trust, a cyber security framework that embeds security throughout the architecture to prevent malicious actors from accessing our most critical assets. We started by partnering closely with U.S. Cyber Command to implement core

Zero Trust principles on our classified network, which will inform Zero Trust implementation throughout the DOD information enterprise.

Countering the cyber threat will take more than just technology; there is also the human aspect. Moreover, we must raise the level of cyber readiness for all, not just those who have cyber or IT in their job description. For this reason, we are focused on creating a culture in which everyone embraces the individual responsibility to be a cyber defender,

maintaining cyber discipline and vigilance as we operate every day.

With USTRANSCOM's inextricable link with commercial transportation providers, we also remain focused on strengthening partnerships with them to mitigate vulnerabilities. Several years ago, we included language in our Readiness Transportation Service Provider contracts, requiring them to conduct an annual cyber security self-assessment of their compliance with National Institute of Standards



Airmen assigned to 305th Aerial Port Squadron upload Guided Multiple Launch Rocket System munitions onboard Boeing 767 at Joint Base McGuire-Dix-Lakehurst, New Jersey, August 13, 2022, as part of security assistance package for Ukraine (U.S. Air Force/Matt Porter)

and Technology security controls. Our analysis that follows their self-reporting shows that compliance continues to improve each year, which highlights our partners' understanding of the importance of implementing sound cyber security practices.

Continuous learning is critical to staying ahead of the cyber threat, so we now have an incredible amount of information-sharing and collaboration happening with our commercial providers. We also have some special projects ongoing that link up

select providers with certain DOD intelligence agencies to help them see themselves more clearly and buy down risk. We are all making progress in mitigating the cyber threat but also know there is more work to be done to build collective resilience.

JFQ: What leadership lessons have helped you pull together diverse organizational cultures both in your command as well as across government, the commercial industry, and international partners?

General Van Ovost: My approach to problem-solving in any organization is to cast the net wider, not smaller. Diversity of background, thought, and experience is a source of strength. Each person brings a unique viewpoint, and complex problems are best solved by empowered teams contributing from different perspectives. But it is not enough to simply invite talent to the table. Trust is foundational to high-performing teams, and the baseline of trust is ensuring transparency

and treating everyone with dignity and respect. It is our responsibility as leaders to guarantee an inclusive culture, in which everyone is inspired to contribute to the mission and grow.

As far as working with industry and international partners, it is very much the same: understand what their interests are and what perspective they bring to the enterprise. As I have stated, we cannot achieve our tremendous accomplishments without the support of our partners and the resources they bring. In our engagements with industry heads and partner-nation leaders, it is important to understand their motivation to work with us and how our partnership can benefit them. Our adversaries are quite adept at using economic and diplomatic influence to stymie our national interests, so we must counter this ability by showing the commercial carriers and our partners and allies that working with us is mutually beneficial.

JFQ: Clearly our defense transportation networks rely heavily on bases, ports, highways, railroads, and waterways, as well as the entire DOD transportation network and that of the rest of the country. What are the most pressing issues your command has identified here at home, and what are you doing to address them?

General Van Ovost: Our national infrastructure, from our roadways and ports to the energy sector, is essential to our ability to project power from the homeland. When we consider not only the physical structures but also the associated systems and networks across the transportation enterprise, there is a tremendous amount of surface area for adversaries to target. Cyber attacks, kinetic attacks, or loss of GPS [global positioning system] would disrupt our operations.

Our adversaries have advanced significantly in their ability to target the homeland through both kinetic and nonkinetic means, so we must find innovative ways to mitigate the effects. Fortunately, studies have shown that the robust U.S. infrastructure makes our transportation network resilient, and we

are able to use effective logistical planning to mitigate any delays. We must ensure that infrastructure is protected and modernized to support our national objectives. Doing so requires deliberate investment in key areas. For command and control, advanced data analytics and artificial intelligence/machine-learning [AI/ML] capabilities will help to accelerate force generation and decisionmaking on how to best apply our finite resources to meet demand in peacetime and wartime. In support of this, we must harden cyber terrain that facilitates their [AI/ML] use—including commercial, public, and military systems.

In the homeland, the recently passed Infrastructure Investment and Jobs Act [IIJA] represents opportunities to reinforce and modernize strategic components of our national transportation system and increase resiliency. Although the IIJA contains elements that will, in the aggregate, improve U.S. transportation infrastructure, none is assessed to be uniquely or directly beneficial to the USTRANSCOM mission. We will continue to work with USDOT [U.S. Department of Transportation], state DOTs, and other transportation agencies to communicate our transportation infrastructure needs and to influence the prioritization of discretionary investment.

One key initiative that we will continue to advocate for, in collaboration with our partners in the Federal Highway Administration [FHWA] and the American Association of State Highway and Transportation Officials, is the adoption of a Military Strategic Transportation Program [MSTP]. This proposed program would support and incentivize state DOTs to prioritize highway projects that are critical to national defense. Absent the adoption of the MSTP, and with the support of FHWA, I have directly communicated specific highway investment needs to key state leaders. I am hopeful that they will consider these needs as they develop their prioritized plans.

Overall, while our infrastructure is robust and resilient, as a nation we must continue the necessary investments to keep it that way. We also need to ensure

that we are adequately addressing potential single points of failure in our overall network such as the Port of Alaska. Finally, we need to continue giving special attention to needed investments at DOD's common-user munition terminals, which are unique in their ability to support large volume/high-net explosive weight missions safely and efficiently to keep them viable and in a high state of readiness.

In a future conflict, there will be attacks that seek to prevent force projection from CONUS. We will have to fight to get to the fight, but we *will* get there.

JFQ: Often USTRANSCOM capabilities and your people perform important and emerging crisis responses that the average person might not know about, such as the recent baby milk shortage. How does your command work with industry to balance the emerging and enduring requirements?

General Van Ovost: Our ability to project military forces is inextricably linked to commercial industry, which provides critical transportation capacity and global networks to meet day-to-day and wartime requirements. Certainly, there are situations that call for capabilities that only reside in our organic military assets, but we consider many factors, such as timeliness, cost, safety and the threat environment, cargo type, and asset availability to determine the right mix. The historic noncombatant evacuation last year out of Afghanistan is a perfect example. We used military airlift, primarily C-17s, to fly into and out of Kabul because these aircraft represented the best option due to their training and defensive capabilities for that environment. The noncombatants were then flown to intermediate staging bases that were in safe locations for additional processing. After, they were transloaded to commercially contracted planes for the remainder of their journey.

JFQ: Acknowledged as the largest crisis airlift of people in history, what can you tell us about how the withdrawal from Afghanistan developed and what you



Evacuees from Afghanistan board Boeing 777 bound for United States from Naval Air Station Sigonella, Italy, August 28, 2021, as part of Operation Allies Refuge (U.S. Navy/Kaila V. Peters)

might have done differently or lessons your command learned?

General Van Ovost: The Afghanistan operation was a tremendous undertaking, and I am incredibly proud of the men and women across the enterprise who made it possible. The success of the effort hinged on effective coordination and communication across the various departments and Services, our commercial partners, and our allies and partners. I was immensely proud to see the time and effort we put into these relationships paying off and saving lives.

With a situation evolving so quickly, like the Afghanistan NEO [noncombatant evacuation operation],

communication is critical. One of the key lessons learned for us was finding ways to flatten our communication with our commercial partners. We found that we did not have the systems set up to quickly share key information for the commercial carriers as they were working through their own decision processes, so it was essential for us to implement changes that now allow us to communicate quickly with our partners at the classified as well as unclassified level.

During the COVID pandemic, we created a series of working groups with rail, road, air, and sea transportation service providers. We established a weekly battle rhythm with all of them to transmit information and receive concerns about

operations through various nodes, the restrictions and the impacts on cargo loading, temperature control, and ensuring the safety of our people. Each week we dealt with a new series of problems. We solved them and we moved on. The biggest lesson learned is that we must coordinate and communicate through and despite the disruptions rather than try to avoid disruptions altogether. This taught us to identify areas in which we could increase the resilience of our transportation networks and our people. During the Afghanistan NEO, we kept that same structure of communication and just changed the content. We did not have to create new relationships, and we moved at the speed of trust.



U.S. Air Force KC-135 Stratotanker aircraft assigned to 100th Air Refueling Wing, Royal Air Force Mildenhall, England, refuels U.S. Air Force F-22 Raptor aircraft assigned to 90th Fighter Squadron, Joint Base Elmendorf–Richardson, Alaska, over Poland, August 10, 2022 (U.S. Air Force/Kevin Long)



Industry partners are essential to our ability to project and sustain the joint force. Afghanistan demonstrated just how much they contribute and what we can accomplish when the enterprise is well synchronized. Getting commercial carriers involved early in the planning process and keeping them in the loop with the latest available information will be essential for any future operation, whether it is humanitarian aid/disaster relief or operations in a contested environment.

JFQ: Another crisis response that has tested your command's capabilities short of wartime, the Russian war on Ukraine, has provided some unique challenges. Can you talk about what you have learned so far, and how that might shape your thinking about other potential responses in the future?

General Van Ovost: The situation in Ukraine brought to the forefront the importance of logistics and the complexity of power projection and sustainment. Our support to Ukraine would not be possible without the strong relationships we have with our allies and partners, who provided the access, basing, and overflight to facilitate the delivery of aid. As I mentioned earlier with the communication efforts initiated during the COVID pandemic, we took that model, adapted it to the Afghanistan NEO, and weaponized it in the support of Ukraine and our NATO [North Atlantic Treaty Organization] Allies.

We proved that we can quickly and efficiently move massive amounts of equipment and materiel halfway around the world, while Russia struggled to effectively supply troops just 75 miles from their border. We make it look easy because we work hard on building and strengthening that robust network of allies and partners, as well as our commercial capacity, that we can leverage in times of crisis.

The Ukraine operations underscore the importance of having an agile mobility force, with both a strategic airlift fleet that can delivery immediately, within hours of notification, and the available

sealift that can deliver a much greater volume of materiel that is essential to delivering and sustaining a decisive force. Working across the enterprise to draw equipment from different locations around the globe, transport it into Europe, and transfer it to our partners that take it directly to the battlefield has been a remarkable feat and demonstrates the value of our partnerships.

JFQ: What have you learned from your experiences as a senior officer involved in joint, international, government, and commercial operations that would be important for more junior officers to know?

General Van Ovost: The demands outlined by the National Defense Strategy and the implications of failure to our democracy have made it clear that we are all in this fight together, and the stakes have never been higher. Our adversaries continue to grow all-domain threat capabilities on par with our own in some areas and with the momentum to surpass us in others. They have studied our tactics and have well-prepared countermeasures. Without change, we could lose.

To maintain our advantage, develop leap-ahead capabilities, and revolutionize the way we operate, we need to trust and empower our people and continue to strengthen our relationships with allies, partners, and industry. Because when it comes down to it, it is less about technology and more about people and culture. Invest your time developing your team—people are our most valuable resource and will make the difference between victory and defeat.

Our people, allies, partners, and industry partners provide us the ability to adapt our operations, shape our capabilities, evolve our operational concepts, and make the investments required to provide the strength to win against any competitor. JFQ



Air Force Staff Sergeant Joshua Poticha, crew chief assigned to 157th Maintenance Group, New Hampshire Air National Guard, marshals 157th Air Refueling Wing's 11th KC-46A tanker, Pease Air National Guard Base, New Hampshire, December 11, 2020 (U.S. Air National Guard/Aaron Vezeau)

Air Mobility Command

The Meaningful Maneuver for Joint Force Victory

By Michael A. Minihan

In April 2021, General Jacqueline Van Ovost, filling the role of commander of Air Mobility Command (AMC), penned a white paper titled *Accelerating Change for Rapid Global Mobility: Delivering Joint Force Success in the High-End Fight*.¹ She outlined AMC's

General Michael A. Minihan is the Commander of Air Mobility Command.

deliberate shift in mindset and tactical approach to staying ready to compete with the high-end adversaries of tomorrow. Fifteen months later, AMC has found itself as the linchpin for several high-profile global operations, including the retrograde of forces from Afghanistan ending the decades-long war, followed by the largest noncombatant evacuation operation (NEO) airlift in history. Currently, we are execut-

ing an ongoing surge operation and delivering billions of dollars of military aid and support to Ukraine alongside North Atlantic Treaty Organization (NATO) Allies and partners to counter Russian aggression.

These, and the often-unnoticed daily operations, continue to spotlight the unique strategic advantage that AMC offers the joint force. The past year's events have shown a reliance by our nation's

leadership on AMC's Rapid Global Mobility (RGM) capabilities and the expectation that the command will deliver this unique capability anywhere and anytime. Throughout its storied history, AMC has demonstrated time and again the ability to remain agile and adapt to any challenge. However, the demands we face now and into the future will present our most daunting challenges.

Future conflicts will be the most demanding, ambiguous, contested, and violent that any of us has ever known. Our next fight will require resilient, unrivaled Mobility Air Forces (MAF) Airmen ready for the environment posed by our pacing competitors, most notably the People's Republic of China (PRC). To secure victory for America, the joint force will require the placement of forces to achieve the strategic advantage in conflict, also known as maneuver. AMC will be the meaningful maneuver for the joint force, and we will deliver victory.

Rapid Global Mobility: Rarely Mentioned, Always There

Historically considered an enabling force, AMC has become the Department of Defense (DOD)'s premier platform to project, connect, maneuver, and sustain our joint force during major combat operations. When the President of the United States directs action, whether it be combat operations, humanitarian support, or any tasking the joint force can execute, it is always assumed that AMC will be able to deliver the forces and equipment needed. When U.S. Transportation Command (USTRANSCOM) needs lethality or hope moved, and moved at tempo, the first call is to AMC. Through its precise execution of our RGM mission, the command ensures the joint force remains armed with the decision advantage through unrivaled airlift, air refueling, aeromedical evacuation, command and control (C2), and global air mobility support.

Serving in multiple roles as the Air Forces Transportation to USTRANSCOM and the lead major command in charge of executing the Air Force's core mission of RGM, AMC

must orchestrate a unique balance of readiness, capability, and capacity. For USTRANSCOM, AMC must supply the readiness and capacity to meet the current daily demand of the joint force and be ready for the big fight tomorrow. For the Air Force, AMC guides and matures the related investments to sustain and develop required RGM capabilities across DOD. Both functions are presently strained fiscally with an aging fleet of aircraft. In addition to these roles and responsibilities, AMC has an obligation to organize, train, and equip for both entities by cultivating a healthy and resilient force of mobility warriors and their families. This latter role is arguably the most important, as we are charged with preparing the force to operate with the proper focus and mindset in line with what will be expected of them at a tempo never experienced by an air component in combat.

Readiness: Nobody Is as Ready as They Think

If General Van Ovost's white paper was the firing of the gun at the starting line, Operation *Allies Refuge* (OAR) was the first lap in a litmus test of the command's intent to accelerate as called for by Chief of Staff of the Air Force General Charles Q. Brown, Jr.'s, action orders from *Accelerate Change or Lose*.² Over 17 days in August, 124,000 U.S. and Afghan personnel were airlifted out of Afghanistan—all of them from one runway. The tempo and location required for the operation did not allow for land or sealift solutions—like what our military will face, and can expect, during a conflict in the Indo-Pacific region. During those 17 days, our mobility forces were significantly tested for the first time in decades. They were tested, and they delivered on the world stage. While there were immense challenges, there were also opportunities for creating additional capacity and efficiency in the future. As with any operation, extensive data capture and debriefing occurred at every level, producing volumes of actionable findings. The Department of the Air Force commissioned one such effort through the LeMay Center's Air Force Lessons

Learned department.³ Despite what the study describes as a “miracle of aviation and logistics,” several essential takeaways are shaping Ukraine support operations and the command's current approach to deterring the PRC. Notable challenges and takeaways from the OAR experience include command relationships (COMREL), authorities, and our interoperability with not only the joint force but also the whole of government, as the Department of State was the lead Federal agency for the operation.

For the first time in recent memory, a large-scale operation in a relatively short contingency duration spanned multiple geographic combatant commands (GCCs)—U.S. Central Command, U.S. European Command, and U.S. Northern Command—as efforts to deliver evacuees to temporary safe havens quickly evolved to a global effort. The cross-GCC effort created challenges with COMREL, doctrinally designed to ensure a unity of command. The uncertainty of global command relationships led to elevated risk to mission and risk to force, as the GCC boundaries posed challenges to the effective and efficient coordination and execution of requirements.

Perhaps no echelon absorbed the brunt of this whirlwind effort more than the 618th Air Operations Center (AOC), located at Scott Air Force Base, Illinois. Our AOC is DOD's largest and only continually manned of its kind, charged with global C2 across the full spectrum of air mobility mission sets. It was not more than a few days into the operation that the 618th AOC established new processes to meet the tempo of operations. The restructuring of key battle rhythm events and the standing up of unique planning and operations cells specializing in collecting whole-of-government-approach data sets are now enduring approaches that will ensure future unity of command. The refinement of C2 concepts following OAR for cross-command operations is already being tested and validated with operations supporting Ukraine. A return to doctrine and a renewed understanding of tactical control versus direct support have produced improved communication during the MAF's current NATO

support operations. Future conflict involving the United States and the PRC will span the boundaries of multiple GCCs, including the U.S. homeland.

OAR also highlighted that current and future conflicts drive the need for improvement of interoperability among other Services, including integrated data systems. Evident at both the tactical and the strategic levels was a lack of understanding, by the joint force, of MAF capability and capacity. This, in turn, led to several parallel lines of effort, hindering the tempo required. Moving forward, as mobility assets increase participation in joint-level exercises, the benefit of recognizing common operating practices, including tactics, techniques, and procedures (TTPs), will only help reduce the fog and friction of joint future combat operations.

Looking Forward: Next Fight Reality

OAR forced AMC to acknowledge that the cultural paradigm shift General Van Ovost called for is overdue. While our Airmen performed brilliantly in the retrograde of forces throughout the summer of 2021 and the record-breaking NEO, it is clear that the future of warfare will be very different and magnitudes more difficult. Outside of the first few days of the OAR missions from Hamid Karzai International Airport, our mobility forces were uncontested in their operations. Any semblance of a contested environment was brought about organically by the stress that the surge event put on our mobility support system, the operations tempo required to accomplish the mission, and the fact that the entire exfiltration occurred from a single runway. From a modern warfare perspective, the entire operation was accomplished in a permissive, uncontested environment. This luxury will not be afforded in future conflicts with a peer competitor. The battlespace will be contested in all domains—and likely at all times. The MAF will be required to operate in these contested domains and the contested environment for the joint force to win.

As AMC and the Air Force transition away from the counter-violent extremist

organization posture of the past two decades, the command is aggressively preparing for a high-end fight while keeping our eyes on the Pacific. The 2022 National Defense Strategy (NDS) makes it clear that our pacing threat is the PRC.⁴ The strategy prioritizes multidomain defense of the homeland against the PRC, deterrence of both attack and aggression from the same force, and a resilient joint force. The NDS contends that DOD will advance these priorities through integrated deterrence, campaigning, and building enduring advantages.

Fight Club: Not Perfect, Just One Step Ahead

AMC does not strive for immediate perfection but rather to stay one step ahead, to outmaneuver, and, frankly, to win. Late last year, the mobility team was charged with understanding the assumptions of the future fight, finding potential gaps to success, and paving an aggressive way forward to closing those gaps to ensure victory for the joint force. Current initiatives such as AMC's "Fight Club" are aimed at just that. Driven by lessons learned and informed analysis, Fight Club is AMC's newest and prolific cross-functional team tasked with critically analyzing the pacing threat and the current plans. It accomplishes this by identifying potential gaps, determining how to close them, and posturing air mobility forces to win anytime and anywhere.

Over the past 8 months, the command has also given the nod to its Army roots, as the headquarters facilitated Rehearsal of Concept (ROC) drills with various cross-functional audiences. Unlike traditional Air Force exercises, which inherently tend to operate on assumptions, ROC drills go into detail about the operations to find inflection points where a planned scheme of maneuver between commanders may break down. The goal is not to be circuitous but to provide a more detailed look at the employment of the plans across slices of time left and right of "boom." While AMC's Fight Club focuses on the pacing challenge and problem sets of U.S. Indo-Pacific Command, the work is directly applicable to other

theaters, where the force will have similar challenges but with more partners, more land, and less distance to cover.

Aggressively and Urgently Closing Gaps

The AMC strategy, released in March of this year, lays a framework for winning. It calls for a warrior culture "biased toward action, unencumbered by bureaucracy, and intentionally disruptive of the status quo," while moving swiftly to close gaps and continue to deter adversaries.⁵ To effectively support the joint force in the future fight, the MAF must command, control, and communicate globally; navigate in degraded environments; conduct enroute logistics under attack; and operate at the highest tempo required to win. These four areas, described as mission imperatives, anchor the future focus. OAR, alongside Ukraine operations, are informing how we look at the Indo-Pacific region. We must think our way through the challenges ahead and drive the changes required for joint force victory.

The reality of recent operations has highlighted that MAF Airmen and the major weapons systems they employ are disconnected from the joint force and vulnerable in the anticipated environments of future conflict. The three prioritized capability gap bins described below align with the AMC mission imperatives and are guiding MAF operations, activities, and investments. The command intends to support the Secretary of the Air Force's Operational Imperatives by urgently and aggressively closing the following gaps.⁶

Connectivity: Sense and Seize Opportunity

AMC's top priority is closing the connectivity gap. Mobility Airmen must be able to receive and transmit real-time C2, logistics, and threat information. Russia's alternative to this ability has been on display, as it struggles to meet its military objectives in Ukraine by relying on a conventional, top-down approach to connectivity. During a high-end conflict, a disconnected force would be unable to support the Secre-



Air Force Airman 1st Class Olivia Gerlach, 721st Aerial Port Squadron ramp services specialist, loads pallets of ammunition onto C-130 Hercules, on Ramstein Air Base, Germany, as part of security assistance package to Ukraine, August 7, 2022 (U.S. Air Force/Emma Quirk)

tary of Defense's and the President's objectives, leading to overall joint force failure. Just sensing data, though, will not be enough. Airmen must make sense of geographic and temporal opportunities to succeed on the next battlefield. The hallmark of AMC has been its global reach. The ability to project the joint force anywhere on the planet is a capability that resides only within the walls of the mobility enterprise. While having a global reach for materiel and personnel is critical, global reach of data is a game changer.

When it comes to combat, the side that can sense and make sense of data at the speed of relevance will win the fight. As the fastest and most agile arm of USTRANSCOM, our global presence

in the durable fabric of the Air Force's Advanced Battle Management System and Joint All-Domain Command and Control networks will enable the connection of data to decision. Where supply can meet demand at the point of need, victory will also reside. That is the business of AMC. Initiatives like employing the command's newest connected platform, the KC-46 Pegasus, in support of the Ukraine effort demonstrate our drive toward a faster decisionmaking capability and improved connectivity.

Survivability: Rather Survive in the Air Than Die on the Ground

As Russia and China develop more advanced weapons, including hypersonic weapons, modernization of the

force is essential to ensure relevancy for MAF platforms in a future conflict. Despite this reality, the competition for scarce resources during an austere fiscal environment is not easily overcome. As a result, AMC faces difficult choices regarding sustainment, modernization, and recapitalization of its aging fleets. The stark reality is that today's fleet and enterprise are what we will bring to the fight. Paramount to closing this gap is aggressive pursuit of fortifying our airborne assets and operating bases with the knowledge and capabilities to survive in contested environments. While defensive systems are also essential, the reality of a peer conflict will dictate that survivability will be anchored on battlespace awareness. Outfitting the current fleet



with advanced capabilities such as the Tactical Data Link and exercising our ability to lift and shift at a moment's notice in and out of permanent and temporary nodes is essential to our ability to survive.

Agility: The Lift and Shift for the Joint Force

The permissive environments of the past several decades have led the joint force to rely on an uncontested combination of robust predictable supply chains, mobilization efforts, and fixed operating bases. Not only will this network be contested at home and on the forward edge of the battlespace, but also the tyranny of distance during a conflict in the Pacific will call for sustained Agile Combat Employment (ACE). The main idea of ACE is the complication of enemy targeting processes by enabling continued generation of combat power by dispersed forces. AMC continues to mature and address these challenges

with concepts such as multicable Airmen, which aim to enable the same combat support capability with a much smaller footprint of forces. It is not hard to imagine a Navy fighter aircraft landing at an austere airstrip in the Indo-Pacific and being refueled, rearmed, and launched by a single Airman from AMC.

Lessons learned by our Contingency Response (CR) forces have fed directly to our Expeditionary Center at Joint Base McGuire-Dix-Lakehurst, New Jersey, and have shaped the development of how the MAF envisions employing its CR forces for the next fight. While our CR forces' main objective was base closures throughout Afghanistan, the method they used to accomplish this feat mirrored the ACE framework that will be required in the Indo-Pacific and has become the baseline of mobility forces training to date. Small, agile teams capable of operating nodes and generating the mission, often cut off from direct C2

support, are precisely what will enable the joint force to seize the opportunities required for success.

Closing the Gaps: Buying Down the Risk Left of Boom

To close the gaps, our focus is on three lines of effort:

- making the best use of our current force and honing our TTPs
- extracting maximum value out of existing capabilities to further strengthen our force
- developing the decisive mobility force of the future.

The first two efforts cost us little to nothing to implement, save for the human capital required to be biased toward action, unencumbered by bureaucracy, and intentionally disruptive to the status quo—that and taking the risk required to accelerate change. As a commander of forces, risk mitigation and assuming undesired risk is one of the



Airmen from 332nd Air Expeditionary Wing forward deploy to support Afghanistan evacuation, August 21, 2021, from undisclosed location in Southwest Asia (U.S. Air Force/Karla Parra)

last areas one wants to look for answers, unless it can be done smartly and effectively for the warfighting Airman. We are willing to take the calculated risk to close these gaps.

Conclusion: There Are No Railroads in the Indo-Pacific

Russia is showcasing that the conventional approach to military travel across land (or sea) has been eclipsed by modern warfare tactics where static lines of communication are easily targeted and disrupted. To overstate the obvious, a fight in the Indo-Pacific region will not even allow the conventional approach to be tested. While the MAF wrestles with the competition between preparing the force for a high-end conflict with a peer adversary amid a fiscally challenging season, one thing remains true: victory will be delivered on the shoulders of mobility Airmen, providing RGM so the United States can fight anywhere, anytime. There is

enough mission requirement to need millions more dollars and thousands more Airmen, but they are not coming. Despite our challenges and the difficult work ahead, the heroic efforts of our mobility Airmen will be called on once again to preserve the peace, prosperity, and prestige of America, and they will be ready to answer that call. Deterrence in words only goes so far in today's global environment, but AMC's proven ability to pivot and move volume at tempo can deter any adversary, if we accelerate and change. JFQ

Notes

¹ Jacqueline D. Van Ovost, *Accelerating Change for Rapid Global Mobility: Delivering Joint Force Success in the High-End Fight* (Arlington, VA: Mitchell Institute for Aerospace Studies, 2020), available at <https://mitchellaerospacepower.org/wp-content/uploads/2021/05/a2dd91_23804d27b3a04670b9f94caae836ef5e.pdf>.

² Charles Q. Brown, Jr., *Accelerate Change or Lose* (Washington, DC: Headquarters Department of the Air Force, August 2020), available at <https://www.af.mil/Portals/1/documents/CSAF/CSAF_22/CSAF_22_Strategic_Approach_Accelerate_Change_or_Lose_31_Aug_2020.pdf>.

³ Air Force Lessons Learned, "LeMay Center Executive Overview on DAF Participation in Operation *Allies Refuge* Lessons Collection," December 7, 2021.

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⁶ Charles Pope, "Kendall Details 'Seven Operational Imperatives' and How They Forge the Future Force," U.S. Air Force, March 3, 2022, available at <<https://www.af.mil/News/Article-Display/Article/2953552/kendall-details-seven-operational-imperatives-how-they-forge-the-future-force/>>.

Midshipman Sayanna Pillay, assigned to U.S. Merchant Marine Academy, takes bearing with gyro repeater on USS *Gerald R. Ford*, underway in Atlantic Ocean, March 25, 2022 (U.S. Navy/Nolan Pennington)



Military Sealift Command

Joint Maritime Mobility

By David Bassett and James Regan

Military Sealift Command (MSC) provides assured logistics to the joint force via sea during strategic competition, crisis, and conflict at the timing and tempo of demand. As the naval component to U.S. Transpor-

tation Command (USTRANSCOM), MSC deploys and sustains the joint force through a blended government-commercial solution of government owned/commercially operated sealift and commercially chartered vessels and services. Central to this logistics mission are MSC's responsibilities to man, train, and equip a force of approximately 130 vessels (government and contractor owned), 70 percent of which

are ready for tasking or on mission at any given time.

MSC provides a high-value service to the U.S. Navy and joint force (approximately 1 percent of manpower, 2 percent of budget, and about 20 percent of the Navy fleet), and this business-savvy organization is constantly evolving to meet challenges across an increasingly contested maritime environment. Long focused on efficiency in force

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employment, MSC is evolving to focus on effectiveness in force development and force generation to assure readiness for strategic competition, crisis, or conflict. The most important lines of effort to assure MSC support to joint force mobility are encouraging seafaring professions, training U.S. mariners to operate in contested environments and integrate seamlessly with allies and the joint force, and accelerating development of a blended commercial/government/allied fleet with the ability to operate in contested environments. These are crucial steps to build and reinforce the strategic advantage afforded to the United States as a maritime nation.

Foster a Seafaring Populace

The heart of MSC's global enterprise are the Americans who sail ships in service to the fleets and joint force. MSC employs seafarers of the United States Merchant Marine (USMM) to operate commercial ships, naval auxiliaries, and other government vessels near U.S. shores and across the globe. A sector of civil transportation that can be mobilized for war efforts, the USMM has supported trade, travel, and defense of the Nation since the Revolutionary War and remains critical to national defense strategies.¹ In 1775, mariners ran supplies through blockades, raided British commerce under letters of marque, captured war prizes such as the HMS *Margaretta*, and seeded the nascent Continental Navy. In peace, mariners facilitate free flows of trade and commerce to enrich the United States, highlighting the dual utility of their profession. Before John Paul Jones became a naval commander, he was a ship captain in the Merchant Marine. Alfred Thayer Mahan understood and professed that merchant mariners and peaceful shipping were the "necessity" or *raison d'être* for maintaining a Navy.²

The Department of Defense (DOD) relies on USMM for military sealift and joint mobility support. These highly qualified, credentialed professionals possess years of experience and specialized training. Officers are licensed by the United States Coast Guard and typically

hold post-secondary degrees in their field. Unlicensed personnel are certified in the broad range of technical skills needed to operate and maintain complex systems afloat. The U.S. mariners who perform MSC/naval transportation support missions, enable joint force mobility, and serve the Navy's fleets are the finest in the world, highly trained, and licensed to national and international standards. Ships and individuals undergo a continuous cycle of audit, inspection, and certification by the Coast Guard and the American Bureau of Shipping, the premier global classification society. This model of third-party administration and oversight is the common denominator of contemporary maritime commerce—notably different from deploy and redeploy, self-train, and self-certify models employed by Active-duty sea Services.³

Military Sealift Command links DOD with the USMM. MSC direct-hires civil service mariners as government employees and contracts with private shipping firms for contract mariners to operate ships on government missions. The command is the largest deep-sea employer of U.S. mariners today, though this was not always the case. In the mid-20th century, the preponderance of global shipping flew the U.S. flag, and government business was a small portion of national maritime activity. Over 70 years, the U.S. flag commercial fleet shrank, and the industrial base with it—the net result of legislation, policy, and market competition. As international trade and U.S. gross domestic product exploded throughout the 20th century, the USMM paradoxically lost both ships and market share, shrinking from nearly 6,000 ships to fewer than 200.⁴ In 2020, U.S.-flagged vessels engaged in international trade comprising less than 0.2 percent of global capacity. Over decades, steady-state government maritime activities became a larger portion of the smaller maritime industrial base, and the DOD-USMM link appreciated in importance to both joint mission assurance and survival of the profession.

The number of U.S. merchant ships and merchant mariners has reached a critically low level. Government and

private corporations are increasingly challenged to find enough qualified personnel to meet day-to-day shipboard requirements. In this environment, large-scale sealift operations may come under significant risk as the "ability of the U.S. Merchant Marine to respond to major military contingencies worldwide is dependent on adequate U.S. flag resources, including a skilled U.S. maritime labor pool."⁵ Competition for talent is fierce across many industries in 2022, seafaring included. Mariners are heavily recruited into cabotage-protected activities including petrochemical exploration/extraction and offshore wind power generation, which diverts candidates from the career tracks that enable joint mobility and fleet Service functions.

With the decline in USMM numbers, the ability to fulfill DOD functions is at risk. The Government Accountability Office, Department of Transportation, Center for Strategic and Budgetary Assessments, and RAND have published reports highlighting the issues associated with a shrinking number of U.S.-flagged ships and U.S. mariners. In 2020, the U.S. Maritime Administration assessed the USMM's ability to meet wartime mobilization needs, finding that Ready Reserve Force sealift manning had no surge margin. They warned, "Any further decline of the mariner workforce increases the risk of not having a sufficient number of mariners with appropriate experience and credentials to support sustained operations."⁶ The subsequent effects of the COVID-19 pandemic, the "Great Resignation," and intensifying competition for seafaring talent suggest the supply-and-demand gap in mariner labor has not corrected course—and may not do so without concerted action. If the United States is to remain a maritime nation capable of projecting power across the seas, decisive steps are needed to assure a seafaring populace adequate for trade, travel, and national requirements.

The United States Merchant Marine Academy (USMMA), located at Kings Point, New York, is one of five Federal Service academies and the sole Federal maritime college with a postgraduation service obligation. USMMA graduates

are commissioned into uniformed service and/or obligated to sail on their license. In June 2022, Secretary of Transportation Pete Buttigieg addressed the graduating class at USMMA, calling it a “deeply and enduringly important part of economic and national security.” This school is an essential component of the future U.S. flag merchant marine. Strategic competition is under way, with China, the world’s largest maritime nation, as the pacing threat. We cannot achieve and sustain long-term advantage without an adequate USMM and a robust maritime industry.

As the U.S. maritime industrial ecosystem inches toward government monopoly and recruitment challenges intensify, the lessons of history and the influence of seapower on it must be remembered. Alfred Thayer Mahan described six fundamental elements of national sea power: geographical position, physical conformation, extent of territory, size of population, character of the people, and character of the government.⁷ The United States enjoys nearly unparalleled advantage in Mahan’s first five elements—and therefore its status as a maritime nation and a global seapower is principally vested in the sixth. The United States identifies as a maritime nation and has underscored that commitment with legislation on several occasions in history.⁸ When the United States fosters an environment for the USMM, its seafaring populace thrives, yielding sustainable strategic advantages in trade, travel, and defense while assuring sealift and global power projection.

Train U.S. Mariners

The U.S. mariner workforce must be properly trained to function safely at sea, serve effectively in contested environments, and integrate seamlessly with the joint force when needed. Responsibility for this function was assigned to the Department of Transportation’s Maritime Administration (MARAD) in the 2020 National Defense Authorization Act. MARAD, in coordination with USTRANSCOM and MSC, is responsible to draft and publish a 5-year plan “to recruit, train, and retain merchant mariners” in the Federal Register.⁹ MSC

recognizes the importance of this assignment and supports the MARAD effort.

Throughout most of American history, the Nation benefited from a capable and effective mariner force ready to move cargo; conduct logistics; and resupply forces in peace, conflict, and crisis. U.S. mariners are Coast Guard-credentialed seafarers who work at sea—often internationally. MSC’s hybrid model encompasses training to satisfy domestic requirements, international standards, and Navy-specific skill sets. Beginning in the 1960s, MSC trained mariners at a facility in Bayonne, New Jersey, proximate to the port of New York. In the 1970s, training shifted to Earle, New Jersey, to collocate with the Naval Weapons Station. The Earle training facility supported a wide range of activities, from cargo handling to firefighting and underway replenishment evolutions.¹⁰ In addition, naval Reservists in the Merchant Ship Naval Augmentation Program were trained to perform and work with consolidation at sea (CONSOL), vertical replenishment, the modular cargo delivery system, the modular fuel delivery system, and astern refueling.¹¹ To be effective in their tasking, U.S. mariners have long blended core professional skills with those required by specialty missions.

Today, MSC mariners are trained at a variety of venues, including in-house training, military schools, and professional institutions (maritime academies, trade schools, and commercial training facilities). Following headquarters consolidation from Washington, DC, to Norfolk, Virginia, the MSC mariner training center relocated to Fort Eustis, Virginia, in 2019.¹² The MSC Underway Replenishment Training Center, located at Joint Expeditionary Base Little Creek–Fort Story in Virginia Beach, focuses on advanced fleet support logistics skill sets including arms, ammunition, and explosives skills such as ordnance movement, storage, administration, and equipment handling, and underway replenishment. Instruction for these unique skills is maintained organically within the organization. Experienced mariners drawn from MSC’s fleet serve as the primary instructors, and

these personnel periodically rotate back to shipboard service to ensure schoolhouse-fleet alignment is maintained.

Strategic competition requires MSC’s mariners to operate across multiple theaters in increasingly contested environments. Evolving from legacy “hub and spoke” logistics operations into a dispersed, agile, and maneuverable network requires new and revitalized skill sets. World War II-era tactics such as emission control, tactical maneuvering, and astern refueling are new again. Atop this foundation, mariners lay modern tactics, techniques, and procedures, including dynamic positioning, expeditionary vertical launch system reload, and maneuver in a communications-denied environment. Instruction and training are not only shore-based but also executed at sea. Fleet integration and command, control, and communications are critical for both Combat Logistics Force (CLF) vessels and commercial sealift and special missions.

Accelerate Future Fleet Development

Since 1949, Military Sealift Command has provided sealift and ocean transportation for all U.S. military Services and other governmental agencies.¹³ Today, many government-owned ships are at end-of-service life. Assuring sealift for national strategy and joint force sustainment requirements in a contested maritime environment requires a three-pronged recapitalization attack of service life extension, used ship purchase, and new ship construction. Industry and allied partnerships are also capable of generating logistics forces as needed to support treaties and security cooperation agreements. These ships will serve in a blended commercial-government network model to distribute logistics securely at the time and tempo of demand.

MSC’s major mission areas are combat logistics, service and command support, special missions, prepositioning, and sealift. The CLF is comprised of government-owned/government-operated oilers, dry cargo and ammunition, and fast combat support vessels; they deliver



Seaman Bobby J. Cunningham signals Military Sealift Command fleet replenishment oiler USNS *Rappahannock* (T-AO 204) during replenishment-at-sea aboard guided-missile destroyer USS *Gridley*, Philippine Sea, January 20, 2022 (U.S. Navy/Colby A. Mothershead)

at-sea sustainment to fleet combatants, allies, and partner nation vessels worldwide. Service and command support vessels provide towing, rescue and salvage support, medical support, and command and control facilities. Special mission ships enable oceanography, underwater surveillance, missile tracking, and submarine and special warfare operations. Prepositioning assets station combat cargo and ammunition in strategic global locations. Sealift vessels move military equipment (rolling stock and dry cargo) and fuel to meet joint force requirements worldwide. Collectively, these ships and mission areas serve the “5Rs” of logistics (refuel, rearm, resupply, repair, and revive).

Sixty new ships are programmed to join MSC’s fleet by 2040. At least 20 of these new vessels will be *John Lewis*-class

CLF oilers. The remaining vessels will serve varying functions across MSC’s five mission areas, including oceanography, tug and salvage, submarine tender, and intra-theater connectors. These ships will serve legacy functions with new hull designs, and many will replace ships designed and built during the Cold War.

The 49-ship organic sealift fleet currently maintained by MSC and MARAD has an average hull age of 45 years.¹⁴ The over 9 million square feet of roll-on/roll-off (RO/RO) capacity that these vessels represent is a critical strategic asset to project the joint force in conflict or crisis. In fiscal year 2021, DOD directed inactivation of seven sealift ships and transfer of eight more RO/RO vessels from MSC’s surge sealift fleet to MARAD’s Ready Reserve Force. These ships, in dire

need of recapitalization, were recently USTRANSCOM’s top readiness concern.¹⁵ Leading the recapitalization charge is the “buy used” approach. MARAD added two used RO/RO vessels, *Cape Arundel* and *Cape Cortes*, to the Ready Reserve Force just this year. It is authorized to purchase five more used ships, although tight market conditions for secondhand ships may present a challenge to this plan in the near term. The “build new” sealift program is another potential solution, but shipbuilding programs are often challenged by cost growth and schedule delay. Regardless of recapitalization mechanism (service life extension, buy used, build new), modern and secure communications systems will be required to achieve fleet integration and resilient command and control.



Civil Service Mariners use fire hose to extinguish simulated ship's engine room fire at Military Sealift Command Training Center East, on Joint Base Langley–Fort Eustis, Virginia, February 23, 2022 (U.S. Navy/Bill Mesta)

Equally important to vessel capacity is the capability to operate in austere, expeditionary, and contested maritime environments; this will be critical to achieve the 5Rs of secure sustainment across vast areas. Agility and resiliency are essential elements to MSC's force development, force generation, and force employment models that provide assured logistics to the joint force in peace, conflict, or crisis.

Agility with an expeditionary focus is key. Single-mission or noncommunicative ships are of limited utility in a contested and distributed maritime logistics environment. MSC, in coordination with industry and military stakeholders, continues to expand operational capability at sea. The command operates five medium-range commercial tank ships that are not only principally employed in point-to-point fuel shipments but also able to pass fuel to CLFs at sea in CONSOL operations. This capability, demonstrated in the RIMPAC (Rim of the Pacific) 2022 exercise, is a force multiplier for naval maneuver, and the MSC continues to advocate for more U.S.-flagged CONSOL-capable commercial tankers. The recent passage of the Tanker Security Program makes up to 10 U.S.-flagged commercial tankers of military utility eligible for a \$6 million annual stipend to participate in the fleet.¹⁶ Organic CONSOL capability is an essential part of military utility in the TSP.

To rapidly impart CONSOL capability in crisis, MSC partnered to develop the Modular CONSOL Adapter Kit (MCAK), a bolt-on system that transforms commercial liquid cargo tankers (of a certain common design) into CONSOL-capable ships. MSC will receive 10 MCAK kits in fiscal year 2023. Similarly, to provide commercially chartered ships with secure communications capability, the Mobile Expeditionary Communications Kit can be deployed in conjunction with a uniformed tactical advisor to execute command and control capability on charters. Depending on specific mission threats, counter-unmanned aerial systems and military or commercial security teams can be embarked for force protection. Additional expeditionary

support systems are in various phases of development, including systems for fuel-over-the-shore operations, torpedo or vertical launch system reload at sea, unmanned aerial systems for high-value parts delivery, maintenance and repair shop “in a box,” and containerized hospital services. Each of these expeditionary capabilities provides options to expand government-owned and government-chartered vessel capabilities to fulfill key warfighting logistic functions.

The blended government-commercial model of MSC relies on commercial partners for joint force deployment and sustainment. American commercial shipping companies either own or operate and maintain more than half of MSC’s fleet. As a DOD head of contracting agency (12 in total), MSC uses contracting as a “weapons system” to rapidly generate and regenerate forces by agreements for charter, repair, and operation/maintenance of ships across the spectrum of conflict. Our partners are essential to this effort, including those outside of the United States. MSC regularly interoperates with allies and partners and serves as custodian of certain unique capabilities. For example, to enable U.S. defense of the Republic of Korea, the Korean Flag Shipping agreement makes 60 Republic of Korea flag RO/RO, container, and tank vessels available for transfer to MSC operational control. There may be opportunity in exploring similar defense among allies with sizable merchant fleets. Several large shipping companies in Europe could enable the rapid assembly of a vast North Atlantic Treaty Organization sealift and tanker fleet in support of conflict or crisis.

As a maritime nation, the United States projects strategic elements of the joint force via sea in peace, conflict, and crisis at the time and tempo of demand. Maritime nation status imparts a competitive advantage in an era of strategic competition. To maintain this competitive advantage, MSC will continue to support maritime academies, mariners, and partners as we look to harness innovation and the American seafaring spirit key. MSC will continue to support joint force mobility and encourage seafaring

professions, to train U.S. mariners to operate in contested environments and integrate seamlessly with allies and the joint force, and to accelerate development of a blended commercial/government/allied fleet with the ability to operate in contested environments. JFQ

Notes

¹ Salvatore R. Mercogliano, “Suppose There Was a War and the Merchant Marine Didn’t Come?” *Proceedings* 146, no. 1 (January 2020), available at <<https://www.usni.org/magazines/proceedings/2020/january/suppose-there-was-war-and-merchant-marine-didnt-come>>.

² Alfred Thayer Mahan, *The Influence of Sea Power Upon History, 1600–1783* (Boston: Little, Brown, and Co., 1898).

³ *Advantage at Sea: Prevailing with Integrated All-Domain Naval Power* (Washington, DC: Department of Defense, December 2020), available at <<https://media.defense.gov/2020/Dec/16/2002553074/-1/-1/0/TRISERVICESTRATEGY.PDF>>.

⁴ Department of Transportation, *National Transportation Statistics: Historical Compendium, 1960–1992* (Washington, DC: Bureau of Transportation Statistics, September 1993), available at <<https://rosap.ntl.bts.gov/view/dot/11971>>.

⁵ David T. Matsuda, *State of the United States’ Merchant Fleet in Foreign Commerce*, Statement Before the House of Representatives Subcommittee on Coast Guard and Maritime Transportation, 111th Cong., 2nd sess., July 20, 2010, available at <<https://www.transportation.gov/testimony/state-united-states%E2%80%99-merchant-fleet-foreign-commerce>>.

⁶ *Goals and Objectives for a Stronger Maritime Nation: A Report to Congress* (Washington, DC: Department of Transportation, February 2020), available at <https://www.maritime.dot.gov/sites/marad.dot.gov/files/2020-07/Final_2_25_Stronger%20Maritime%20Nation%20Report_.pdf>.

⁷ Mahan, *The Influence of Sea Power Upon History, 1600–1783*.

⁸ “The Maritime Administration’s First 100 Years, 1916–2016,” Department of Transportation, available at <<https://www.maritime.dot.gov/history/historical-documents-and-resources/maritime-administration%E2%80%99s-first-100-years-1916-%E2%80%93-2016>>.

⁹ *William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021*, 116th Cong., 1st sess., January 1, 2021, available at <<https://www.govinfo.gov/content/pkg/PLAW-116publ283/html/PLAW-116publ283.htm>>.

¹⁰ *Underway replenishment* refers to the at-sea delivery of sustainment supplies to combatant vessels, including food, fuel, parts, arms/ammunition, and explosives.

¹¹ “Merchant Ship Naval Augmentation Program (MSNAP): Sealift Enhancement Feature (SEF),” *Global Security*, available at <[https://www.globalsecurity.org/military/systems/ship/systems/msnap.htm#:~:text=Augmentation%20Program%20\(MSNAP\)-,Sealift%20Enhancement%20Feature%20\(SEF\),during%20a%20crisis%20or%20conflict](https://www.globalsecurity.org/military/systems/ship/systems/msnap.htm#:~:text=Augmentation%20Program%20(MSNAP)-,Sealift%20Enhancement%20Feature%20(SEF),during%20a%20crisis%20or%20conflict)>.

¹² Bill Mesta, “Military Sealift Command Training Centers; Your Future in the Fleet Begins Here,” U.S. Navy, March 18, 2022, available at <<https://www.navy.mil/Press-Office/News-Stories/Article/2972317/military-sealift-command-training-centers-your-future-in-the-fleet-begins-here/>>.

¹³ Prior to 1970, Military Sealift Command was known as the Military Sea Transportation Service.

¹⁴ Government Accountability Office (GAO), *Navy Readiness: Actions Needed to Maintain Viable Surge Sealift and Combat Logistics Fleets*, GAO-17-503 (Washington, DC: GAO, August 2017), available at <<http://purl.fdlp.gov/GPO/gpo84248>>.

¹⁵ Department of Transportation, *Posture and Readiness of the Mobility Enterprise*, Oral Statements Before Subcommittees on Seapower and Projection Forces and Readiness Joint Hearing, 117th Cong., 2nd sess., March 31, 2022, available at <<https://www.maritime.dot.gov/newsroom/congressional-testimony/oral-statements-subcommittees-seapower-and-projection-forces-and>>.

¹⁶ See 46 U.S. Code, chap. 534, “Tanker Security Fleet,” January 1, 2021, available at <<https://uscode.house.gov/view.xhtml?path=/prelim@title46/subtitle5/partC/chapter534&edition=prelim>>.



KC-10 Extender, assigned to 908th Expeditionary Air Refueling Squadron, refuels Air Force F-16 Fighting Falcon, assigned to 179th Expeditionary Fighter Squadron, over U.S. Central Command area of responsibility, June 11, 2022 (U.S. Air Force/Christian Sullivan)

Strategic Mobility in the Context of U.S. National Defense Strategies

By Bruce Busler

Over the past 30 years, the United States has seen a gradual shift in defense strategies driven by the end of the Cold War; the aftermath of

Operations *Desert Shield*, *Desert Storm*, *Iraqi Freedom*, and *Enduring Freedom*; and the final withdrawal of U.S. forces from Afghanistan in the summer of 2021. The past 5 years have been punctuated by the disquieting rise of Great Power competition and the compelling need to deter and, if necessary, prevail in conflict against Russia and the

People's Republic of China, the 2022 National Defense Strategy (NDS)'s pacing threat.

For decades, U.S. military planners have assumed that our ability to project military forces globally would be relatively unhampered, benefiting from the unequaled advantage of our ability to deploy and sustain the joint force anywhere

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in the world at the time and place of our choosing to attain national objectives. The ability to provide swift aid to our allies and partners, as exhibited in the recent flow of lethal aid to Ukraine and the airlift of equipment and munitions to Israel in Operation *Nickel Grass* in 1973, has long been a U.S. tool for international humanitarian relief operations or rapid support of allies and partners. The Berlin Airlift in 1948–1949 perhaps most famously demonstrated Western resolve through air transport to confront Soviet intent to dominate Eastern Europe. While useful in this role, the U.S. mobility enterprise is ultimately shaped and sized for the rapid wartime projection of decisive military power to confront our adversaries with an assured response that should leave no question that the United States will prevail.

Today, the NDS continues to rely on our asymmetric mobility capabilities for global campaigning in combination with our allies and partners to bolster the strategy's cornerstone of integrated deterrence. U.S. Transportation Command (USTRANSCOM)'s contribution to daily campaigning and wartime power projection, inherent in integrated deterrence, stems from the three elements in the command's mobility warfighting framework:

- global mobility posture through a robust network surface infrastructure and nearly 90 key enroute international airfields and seaports in 44 host nations for resilient access, basing, and overflight
- global mobility capabilities leveraging both organic and commercial assets for strategic airlift, sealift, air refueling, theater airlift, aeromedical evacuation, and enablers for end-to-end connectivity
- global command and control and integration of all elements necessary to rapidly align scarce mobility resources to meet the Department of Defense (DOD)'s highest priorities.

All three elements of this framework are under increasing risk by Great Power adversaries, who have studied U.S. power projection advantage for the past several decades, with both China and Russia

developing cyber and antiaccess/area-denial capabilities coupled with malign geopolitical influence to degrade, disrupt, and deny our ability to deploy and sustain U.S. forces.

Every National Security Strategy (NSS) and NDS in the past 30 years has recognized the warfighting elements cited above, to varying degrees over time. Linked to these strategies, associated mobility studies analyzed necessary capabilities to achieve strategic end-states. These studies continue to garner congressional interest and drive debate within DOD on mobility sufficiency to satisfy the strategy's endstate. While there have been periods of investment for new mobility capabilities (historically modernized as once-every-generation programs in the aftermath of hard-learned lessons), the trend over time has been to take risk in mobility capacity when 85 percent of combat power is now stationed in the United States, yet the ability to deploy and sustain those forces on a global scale is on a glide path toward historic lows. Mobility and logistics are recognized as foundational to evolving warfighting concepts confounded by the long-distance, overwater geography in the Indo-Pacific, prompting us to remember that “amateurs study tactics; professionals study logistics,” as General Omar Bradley is said to have stated.

In the historical review that follows, the value in assessing these inflection points is identifying and solidifying answers to this fundamental question: What key capabilities must the Joint Deployment and Distribution Enterprise provide, and how much is enough? The point then in this accounting is to grapple with the proverb “For Want of a Nail,” to reveal current and future deficiencies in the Joint Deployment and Distribution Enterprise that could create strategic impediments if not fully appreciated.

Mobility Capabilities and Capacity: A Historical Perspective

The shift away from forward-deployed to continental United States–postured forces at the end of the Cold War drove an investment in strategic lift. With the

collapse of the Soviet Union and the advent of a more uncertain security environment, the August 1991 NSS noted that “the ability to project our power will underpin our strategy more than ever,” given that “forward presence is declining, and the number of potential flashpoints is increasing.”¹ In response, Congress directed in the fiscal year (FY) 1991 National Defense Authorization Act (NDAA) the 1992 Mobility Requirements Study (MRS), the first mobility study in the post–Cold War era.² The *Desert Storm* experience influenced the George H.W. Bush administration's 1991 NSS to observe that the war to liberate Kuwait was “stunning,” with the ability to defeat Iraqi ground forces in only 100 hours. At the same time, the strategy lamented that the deployment of decisive U.S. forces required 6 months under relatively uncontested conditions.

The 1991 NSS further emphasized that future security needs would elevate the importance of mobility capabilities, stating that “as overall force levels draw down and our forward-deployed forces shrink, we must sustain and expand our investment in airlift, sealift, and—where possible—prepositioning.”³ The Bush administration carried forward that imperative in the 1993 NSS, stating that “we must capitalize on our traditional strengths, learn from our experience in *Desert Storm*” and “improve our ability to . . . project power by expanding our air and sealift capabilities as well as by enhancing the inter-theater strategic agility of our forces.”⁴ The MRS, based on two major regional contingencies (MRCs), drove procurement of 20 large, medium-speed roll-on/roll-off vessels and supported the full C-17 program buy of 120 aircraft with analysis indicating shortfalls would exist in the Southwest Asia early delivery period, suggesting more C-17s would be required.

The reduction in defense spending in the 1990s further underscored the need for strategic mobility. The 1993 Bottom-Up Review led by Secretary of Defense Les Aspin during the Bill Clinton administration set off a debate on the merits of force sufficiency in the post–Cold War era, with the ultimate impact

being steep defense cuts.⁵ Secretary Aspin stated, “The underlying premise of the Bottom-Up Review was that we needed to reassess all our defense concepts, plans, and programs from the ground up.”⁶ In the immediate aftermath, consternation surrounded the two-MRC “win-hold-win” approach and reduction in forces to match budget goals. In hindsight, the Bottom-Up Review gained favor as a “high-water mark for strategy.”⁷

The Clinton administration codified this theme of mobility as an asymmetric advantage, stating in the 1994 NSS, “The United States is the only nation capable of conducting large-scale and effective military operations far beyond its borders” and “must be capable of responding quickly and operating effectively,” demanding “strategic mobility” and “sufficient support and sustainment capabilities.”⁸ Following the Bottom-Up

Review, the Mobility Requirements Study Bottom-Up Review Update sought to address significant changes in mobility assumptions and programs since the MRS.⁹ The study sustained recommendations for the additional roll-on/roll-offs (RO/ROs) and created a mandate for a more formalized means to access commercial sealift, which became the Voluntary Intermodal Sealift Agreement (VISA). The study also included a strategic airlift force-mix analysis, which again supported the full program buy of 120 C-17 aircraft.

At the end of the Clinton administration, the 1999 NSS identified the central role of the Nation’s unique mobility capabilities, stating:

Strategic mobility is a key element of our strategy. It is critical for allowing the United States to be first on the scene with assistance in many domestic or

*international crises. . . . Deployment and sustainment of the U.S. and multinational forces requires maintaining and ensuring access to sufficient fleets of aircraft, ships, vehicles, and trains, as well as bases, ports, pre-positioned equipment, and other infrastructure.*¹⁰

The accompanying Mobility Requirements Study 2005 (MRS-05), completed in 2000, offered few major changes from its predecessors.¹¹ Its two major theater war framework remained comparable to previous two war constructs. For sealift, the RO/RO requirement remained as in previous studies with fuel requirements satisfied by U.S. and Effective U.S. Controlled (EUSC) fleets of 110 tankers. For inter-theater airlift requirements, the deployment needs for two theaters exceeded the FY05 total aircraft inventory of 120 C-17s, 126



Air Force C-5M Super Galaxy from 436th Airlift Wing flies behind KC-135R Stratotanker from New Jersey Air National Guard's 141st Air Refueling Squadron for refueling over Nova Scotia, Canada, April 15, 2021 (U.S. Air National Guard/Matt Hecht)



Formation of MC-130J Commando IIs deployed with 1st Special Operations Squadron conduct “flight of the flock” off coast of Okinawa, Japan, January 7, 2022 (U.S. Air Force/Stephen Pulter)

C-5A/Bs, and 54 KC-10s in a dual-use cargo role, which was deemed insufficient. As a result, MRS-05 recommended additional C-17 procurement to increase the fleet from 126 to 176.

For nearly two decades beginning in the early 2000s, DOD was deeply involved in the “war against violent extremism,” with significant forces deployed to Afghanistan and Iraq. Amid that effort, evolving global defense posture, new force sizing constructs, revised campaign scenarios, and transformation efforts led to the Mobility Capabilities Study (MCS) in 2004.¹² MCS assessed mobility requirements of the dual major combat operations (MCOs) likely in 2012, presuming that they would be similar in size and scope to those of previous scenarios. The National Military Strategy and Defense Planning Guidance at the time called for a force-sizing construct to defend the United States, deter in critical regions, swiftly defeat

aggression in overlapping major conflicts, and win decisively in one major conflict.¹³ This “1-4-2-1” force-sizing construct was accompanied by joint swiftness goals to seize the initiative. The pacing demand came from the more stressing combination of dual MCOs, as well as a baseline security posture that reflected a combination of lesser contingency scenarios and historical workload. For sealift, the MCS determined that the programmed organic sealift fleet along with commercial VISA augmentation was sufficient to support the strategy. For fuel distribution, the MRS noted the projected 2012 U.S. and EUSC tanker fleet of 62 vessels was unable to satisfy the inter-theater delivery of fuel. For strategic airlift, the study concluded the programmed fleet of 292 C-17 and C-5 aircraft met the lower bound of the requirement, and the C-130 fleet of not less than 451 was deemed sufficient for the dual MCO scenario. Air refueling

for the MCS included the first comprehensive joint air refueling analysis for not only the dual MCO deploy and employ missions but also homeland defense and baseline security posture global demands. The overall “stacked” demand exceeded the programmed fleet of 497 KC-135 and KC-10 aircraft.

The Mobility Capabilities and Requirements Study 2016 (MCRS-16) was completed in 2010, at the transition of the George W. Bush and Barack Obama administrations.¹⁴ The 2006 NSS and 2008 NDS set a blueprint for the incoming administration and clearly articulated challenges in sustaining efforts against violent extremist organizations while simultaneously preparing for full-spectrum warfare. The study focused on the 2016 time frame and retained the ability to wage two nearly simultaneous conventional campaigns as the “cornerstone of U.S. defense.” MCRS-16 used defense planning scenarios to address

mobility operations for dual MCOs, another scenario based on a single MCO, and a scenario involving a long-term irregular warfare campaign, compounded by homeland defense events and Steady-State Security Posture activities placing demands on mobility forces.

For sealift, the two-MCO scenario (dominated by the major land campaign) required all organic RO/ROs plus VISA and resulted in delayed force closure for the second land war. With respect to inter-theater fuel distribution, the U.S. and EUSC fleet was assessed as sufficient, counting on over 1,980 militarily useful foreign-flagged tankers available worldwide. For strategic airlift, the dual-campaign scenario the programmed strategic airlift fleet of 223 C-17s and 111 C-5s exceeded the requirement, leading to the retirement of some C-5A inventory. The Civil Reserve Air Fleet (CRAF) at stage III levels met requirements. The study also highlighted the impact of adversary threats on CRAF operations, with CRAF aircraft forced to locations outside of threat ranges leading to transload operations. Requirements for intra-theater airlift for the dual-campaign scenario were readily satisfied by the programmed 401 C-130 total aircraft inventory. Finally, air refueling had intensified, with fleet demand for the single-MCO exceeding the programmed fleet of 474 KC-10s and KC-135s and captured as elevated risk.

The 2012 NDS served as a major departure from prior defense strategies, with the demise of the long-held dual-war construct. The NDS, signed by President Obama, revised defense objectives, stating, “Even when U.S. forces are committed to a large-scale operation in one region, *they will be capable of denying the objectives of—or imposing unacceptable costs on—an opportunistic aggressor in a second region.*” This “defeat/deny” force-sizing construct shifted the nature of the pacing demands. Responding to this new challenge required that “ground forces will be responsive and capitalize on balanced lift, presence, and prepositioning to maintain the agility needed to remain prepared for the several areas in

which such conflicts could occur.”¹⁵ The strategy also called for planning changes from regional to a “globally networked approach to deterrence and warfare,” which expanded the nature of global responses from the mobility enterprise. Accompanying DOD planning guidance specified two separate force-sizing scenarios, one involving dual MCOs and the second a major MCO with a small-scale counterinsurgency (historical Operation *Enduring Freedom* support), with both maintaining a heightened defense posture in the United States.

The FY13 NDAA drove the Mobility Capabilities Assessment, which was completed in 2013 during the Budget Control Act of 2011 constraints.¹⁶ The study found the planned strategic sealift fleet was sufficient, noting that military RO/ROs would start aging out by FY23, calling for a sealift recapitalization program. The strategic airlift fleet of 275 C-17s and C-5Ms was assessed as acceptable risk, and the CRAF program, for both cargo and passenger airlift, was sufficient at stage III levels, with transload operations still necessary due to threats. For theater airlift, the fleet of 358 C-130s was more than adequate to satisfy the defeat/deny scenario. An air refueling “capacity bathtub” of 455 operationally usable aircraft fell short of the programmed fleet of 479 KC-10, KC-135, and KC-46 aircraft, which was at elevated risk for the defeat/homeland defense “stacked” demand.

Strategy shifted as the United States recognized new global challenges. The 2017 NSS reflected global competition and specified the need for a ready military with the ability to “get to a theater in time to shape events quickly. This will require a resilient forward posture and agile global mobility forces.”¹⁷ The associated 2018 NDS brought a heightened sense of urgency with its emphasis on the impact of the post–World War II international order, indicating the “United States now faces a more competitive and dangerous international security environment than we have seen in generations.”¹⁸ The reemergence of Great Power competition brought about the “2+3” threat approach rebalancing the DOD focus on

China and Russia, followed by regional threats as well as the continued threat of violent extremist organizations. The NDS emphasized both daily competition and wartime missions as integral to the strategy and recognized “resilient and agile logistics” as a key capability.

To accomplish that end, the NDS prioritized “prepositioned forward stocks and munitions, strategic mobility assets, partner and allied support, as well as non-commercially dependent distributed logistics and maintenance.”¹⁹ Congress subsequently directed the Mobility Capabilities and Requirements Study 2018 (MCRS-18) to identify mobility requirements necessary to meet the newly published strategy.²⁰ The resulting MCRS-18 response to Congress stated that the FY23 mobility program of record capacity for each fleet could meet combatant commanders’ requirements consistent with the strategy, but with elevated risk in several areas. However, the MCRS-18 Great Power demands for both China and Russia drove a requirement for new operation plans and planning scenarios that were not sufficiently mature for inclusion in the study.

The need for requirements analysis to reflect the changing geopolitical landscape and trends led to the FY20 NDAA direction for another mobility study (MCRS-20) along with a fuel tanker study for maritime fuel transport. Results from both studies were delivered to Congress in June 2021, reflecting the 2018 NDS wartime requirements analyzed using approved operational demands as directed by the Deputy Secretary of Defense. MCRS20 found the programmed fleets to be sufficient in most areas, with a few key areas challenged to meet wartime demands with elevated risk or active mitigations to address deficiencies.

Reflecting Great Power intent to interrupt U.S. force flow, the study included in-depth adversary threat actions for both indirect effects (access/cyber) and direct effects (kinetic attacks against assets/nodes), as well as an assessment of future warfighting concepts focused on the Indo-Pacific region. The fuel tanker study identified a major shift in



Senior Airman Jolan Besse, 535th Airlift Squadron loadmaster, directs K loader while loading cargo onto C-17 Globemaster III in support of airdrop exercise at Joint Base Pearl Harbor–Hickam, Hawaii, August 24, 2022 (U.S. Air Force/Makensie Cooper)

the last decade, undermining long-held views that EUSC or large inventories of foreign-flagged vessels were adequate to meet U.S. wartime needs. Unfriendly foreign financing with the potential for Chinese controlling interests in fuel shipping led to congressional support for a tanker security program to bring at least 10 U.S.-flagged vessels into a tanker security fleet capable of meeting U.S. wartime demand. The need for many friendly “blue” foreign-flagged intra-theater fuel vessels in the Indo-Pacific was identified as an area of elevated risk and a prime opportunity for allied/partner contributions. Understandably, the most recent defense strategies and mobility studies remain

classified, with specific scenarios, risk elements, and mitigations approaches closely held for good reason. However, the outward manifestation in terms of mobility force outcomes reflect recent trends in strategic thought downplaying the role of strategic mobility.

The State of the Mobility Enterprise: Looking Forward

As Mark Twain is said to have observed, “History doesn’t repeat itself, but it often rhymes.” Fresh lessons from *Desert Storm* drove elevated awareness on the importance of strategic mobility; the last two decades of unflinching but relatively routine delivery of forces and sustainment to Southwest Asia set

conditions to deemphasize wartime mobility output. Alarming, the mobility enterprise has been on an insidious downward trend since the end of the Cold War. Today’s mobility forces are the legacy of hard-fought investments in RO/ROs and C-17s along with ongoing KC-46 procurement as the bedrock to keep each of these fleets viable. In 2022, mobility and transportation daily activity is less than half the peak of 2010 associated with the Operation *Iraqi Freedom* surge, and mobility forces are on a similar trajectory.

Strategic airlift is a unique U.S. capability, reflecting strategic power projection imperatives. Today’s organic strategic airlift capacity remains



Sailors from Task Group 75.2 onload Army vehicles onto roll-on/roll-off cargo ship *MV Cape Hudson*, at Naval Base Guam, October 4, 2020 (U.S. Navy/Nick Bauer)

significant, with 275 C-17 and C-5M aircraft, producing roughly 10 percent less output than the 1990 fully mobilized fleets, despite a 30 percent decrement in aircraft from a high of 392. The C-5 fleet, delivered in the 1970s and 1980s (with the last updated C-5M delivered in 2018), is expensive to maintain and operate but provides significant long-haul cargo capability. The C-17 workhorse has been used hard for many years yet is expected to retain service life into the 2050s. The combined output of both C-5M and C-17 fleets is necessary and consequential with no C-X replacement

on the horizon. U.S. reliance on our commercial partners is also critical for airlift, and both cargo and passenger carriers continue to fully subscribe to the CRAF program despite surges in e-commerce and COVID-19 impacts.

The air refueling fleet in its size and ability to rapidly deploy and employ a wide range of combat aircraft is also uniquely American. In 1990, the air refueling fleet held 670 aircraft, with a projected inventory of just 455 tankers by 2029. Those tankers will be predominantly 67-year-old KC-135s, along with a fleet of 179 new KC-46s being delivered now. A follow-on

KC-Y bridge tanker is vital to replace aging KC-135s in sufficient numbers to meet future requirements.

Commensurate with the demise of a two-theater-war strategy, the C-130 fleet was reduced more than any other mobility capability area, from a high of 549 aircraft in 1990 to 271 today, with C-130Js gradually replacing C130Hs. Indo-Pacific dynamic basing and maneuver concepts have elevated the need for intra-theater lift, and the C-130, along with smaller sealift vessels suitable for austere operations, is meeting requirements for distributed operations.

Strategic sealift organic surge capacity has proved to create an enduring requirement of approximately 10 million square feet (50 RO/ROs of various sizes) to deploy 90 percent of the cargo for a decisive force anywhere in the world. A majority of the fleet retires by the early 2030s, and a modest recapitalization rate for the RO/RO fleet will eventually drop capacity to approximately 8 million square feet by 2030. In addition, U.S. national security depends on the vitality of commercial U.S.-flagged vessels in oceangoing trade, especially for U.S. mariners that operate every vessel in the organic sealift fleet. U.S.-flagged shipping continues to struggle to the point where only about 180 of approximately 50,000 large, oceangoing commercial vessels worldwide sail under the U.S. flag. According to the Maritime Administration, the decline of the commercial U.S.-flagged fleet has been a perennial and intensifying challenge, and any further decline of the actively trading U.S.-flagged fleet reduces our nation's ability to unilaterally project and sustain our forces during war.²¹

By all accounts, U.S. mobility capabilities appear formidable but are dwindling and aging. These airlift, air refueling, and sealift capabilities separate the United States as a superpower from both our closest allies and our Great Power adversaries. That said, the mobility enterprise cannot be taken for granted and must not be further discounted. Whereas yesterday's large-scale deployment for *Desert Storm* allowed time to stumble and recover, the speed and expanse of an Indo-Pacific conflict would require velocity at scale. The central role of mobility and logistics in underwriting joint force lethality cannot be overstated. Credible mobility capabilities—requisite capacity and necessary readiness for their employment—will continue to remain necessary and relevant to current and future defense strategies. Sustaining and recapitalizing these forces must be a DOD focus to ensure the mobility enterprise remains a national comparative advantage.

While the character of Great Power warfare is changing and challenging power projection, the need to deploy and sustain U.S. military power globally

remains fundamental. We would be well served to reflect on the criticality of strategic mobility over the past 40 years, echoed by an observation from the seminal 1981 Congressionally Mandated Mobility Study that remains unwavering over the years: “Our influence worldwide has become increasingly dependent upon our ability to project forces in support of our national interests and commitments. Mobility is central to our force projection strategy.”²² JFQ

Notes

¹ *National Security Strategy of the United States* (Washington, DC: The White House, August 1991), available at <<https://nssarchive.us/wp-content/uploads/2020/04/1991.pdf>>.

² *Mobility Requirements Study*, vol. 1 (Washington, DC: The Joint Staff, January 23, 1992); *Mobility Requirements Study*, vol. 2 (Washington, DC: The Joint Staff, June 5, 1993).

³ *National Security Strategy of the United States* (Washington, DC: The White House, August 1991).

⁴ *National Security Strategy of the United States* (Washington, DC: The White House, January 1993), available at <<https://nssarchive.us/wp-content/uploads/2020/04/1993.pdf>>.

⁵ Raphael S. Cohen, *The History and Politics of Defense Reviews* (Santa Monica, CA: RAND, 2018), available at <https://www.rand.org/pubs/research_reports/RR2278.html>.

⁶ *Report on the Bottom-Up Review* (Washington, DC: Department of Defense [DOD], October 1993), available at <https://archive.org/details/DTIC_ADA359953>.

⁷ Cohen, *The History and Politics of Defense Reviews*.

⁸ *A National Security Strategy of Engagement and Enlargement* (Washington, DC: The White House, July 1994), available at <<https://nssarchive.us/wp-content/uploads/2020/04/1994.pdf>>.

⁹ *Mobility Requirements Study Bottom-Up Review* (Washington, DC: The Joint Staff, March 28, 1995).

¹⁰ *A National Security Strategy for a New Century* (Washington, DC: The White House, December 1999), available at <<https://clintonwhitehouse4.archives.gov/media/pdf/nssr-1299.pdf>>.

¹¹ *Mobility Requirements Study 2005* (Washington, DC: The Joint Staff, January 24, 2001).

¹² *Mobility Capabilities Study* (Washington, DC: Office of the Secretary of Defense for Program Analysis and Evaluation, December 19, 2005).

¹³ *The National Military Strategy of the*

United States of America (Washington, DC: DOD, 2004).

¹⁴ *Mobility Capabilities and Requirements Study 2016* (Washington, DC: The Joint Staff, February 26, 2010).

¹⁵ *Sustaining U.S. Global Leadership: Priorities for 21st Century Defense* (Washington, DC: DOD, January 2012).

¹⁶ *Mobility Capabilities Assessment* (Washington, DC: The Joint Staff, May 1, 2013) (DOD report); *Mobility Requirements and Capabilities Study* (Washington, DC: The Joint Staff, November 14, 2013) (congressional memo).

¹⁷ *National Security Strategy of the United States* (Washington, DC: The White House, December 2017), available at <<http://nssarchive.us/wp-content/uploads/2020/04/2017.pdf>>.

¹⁸ John M. Pletcher and Carolyn M. Gleason, “Department of Defense Press Briefing on the Fiscal Year 2019 Air Force Budget,” DOD, February 12, 2018, available at <<https://www.defense.gov/News/Transcripts/Transcript/Article/1439880/department-of-defense-press-briefing-on-the-fiscal-year-2019-air-force-budget/>>.

¹⁹ *Summary of the 2018 National Defense Strategy of the United States of America: Sharpening the American Military's Competitive Edge* (Washington, DC: DOD, 2018), 7.

²⁰ *Mobility Capabilities and Requirements Study 2018* (Washington, DC: The Joint Staff, January 9, 2019) (congressional memo); *Mobility Capabilities and Requirements Study 2018* (Washington, DC: The Joint Staff, April 29, 2019) (U.S. Transportation Command report).

²¹ Statement of Mark Buzby, *State of the Mobility Enterprise*, Before the House Armed Forces Committee, Subcommittee on Seaport and Projection Forces and Subcommittee on Readiness, 116th Cong., 1st sess., March 7, 2019.

²² *Congressionally Mandated Mobility Study*, vol. 2, *Mobility History* (Washington, DC: Office of the Secretary of Defense, April 30, 1981).



Soldier with 2nd Battalion, 35th Infantry Regiment, 3rd Brigade Combat Team, 25th Infantry Division, secures truck to deck of USAV *General Brehon B. Somervell* before setting sail on October 17, 2021, at Waipio Point, Hawaii (U.S. Army/Rachel Christensen)

The Surface Deployment and Distribution Command

Operating Within the Larger Sustainment Enterprise

By Fred Teeter

Major Fred Teeter, USA, is Chief of the Commander's Action Group for the Military Surface Deployment and Distribution Center.

As the Army Service Component Command of U.S. Transportation Command (USTRANSCOM) and a major subordinate

command to Army Materiel Command, the Military Surface Deployment and Distribution Command (SDDC) is the global intermodal surface connector. It

exists to move, deploy, and sustain the Armed Forces to deliver readiness on time, on target, every time. The organization executes this mission as a key member of the Joint Deployment and Distribution Enterprise (JDDE), which is committed to integrating, synchronizing, and providing global deployment and distribution capabilities to deliver and sustain the U.S. military in support of the Nation's objectives.

Balanced Logistics Planning

Often customers do not realize the scope of effort that goes into the deployment planning process, only understanding that they “need it quickly” or “need to move a lot of equipment.” As a key integrator for the joint force, SDDC translates those joint force customer requirements into transportation solutions, using a mix of organic and commercial industry assets.

When planning for large moves or contingencies, SDDC is the connective tissue that turns movement planning into reality. By understanding there are many more factors involved than just time and volume, the scope of the move increases with multiple nodes and modes that become available to support the warfighter. Figure 1 helps explain the connection that SDDC provides between the joint force (the customer) and commercial industry.

This figure depicts a balanced model identifying several key factors that impact movement planning and help determine which modes and nodes materiel will travel. In an ideal situation, the model is balanced with accurate, customer-provided requirements that include a specific time of need and available funding that supports the transportation method. When this information is in balance, SDDC and USTRANSCOM's other component commands can better interpret the data to find the most effective means available to deliver goods on time. Working with accurate requirements, SDDC can coordinate with industry partners in a timely manner to ensure capacity, availability, and infrastructure that can support the movement. It is this exchange of timely information that helps build a robust connection between the government and industry partners.

When customers fail to accurately plan or establish clear requirements, this model becomes unbalanced. Short notice of a move requirement is likely to decrease transportation asset availability and increase cost. While the network is resilient, there are negative tradeoffs for any situation in which requirements are not clearly articulated to USTRANSCOM, SDDC, or other partners within the JDDE. The goal is to have clear and

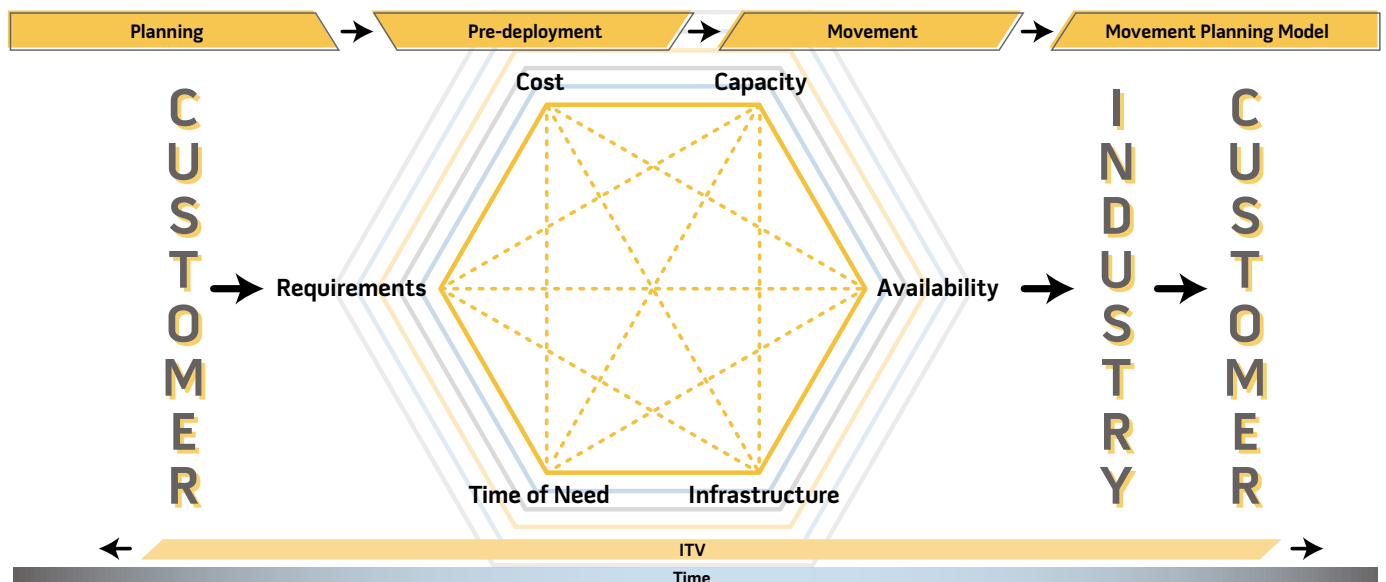
accurate forecasts that help ensure that commercial industry can respond to and effectively facilitate movements.

As we have seen in the past year, there are often factors that can bring this model out of balance. In today's dynamic environment, it is important for the military and commercial industry partners to share forecasts and accurate estimates. By maximizing prioritization and coordination, imbalances can be overcome. As the flow of information increases, the network is strengthened in ways that provide both availability and infrastructure forecasts, optimized for required capacity during both peacetime and contingency operations.

Modeling Large-Scale Operations

Moving cargo by truck, rail, barge, and vessel through ports around the world daily, SDDC planners require an agile, adaptive, and resilient model that they can draw upon to make effective transportation sourcing decisions. SDDC is responsible for all aspects of movement coordination, including ordering and scheduling trucks, trains, and vessels and communicating with supported units to ensure that unit deployment lists are validated and that Joint Operation Planning and Execution System (JOPES) data are accurate. This coordination ensures units have execution

Figure 1.



Soldiers conduct rail load operations at Fort Drum, New York, January 24, 2019, to prepare for deployment to Joint Readiness Training Center at Fort Polk, Louisiana (U.S. Army/Keegan Costello)





instructions via a port call order to successfully move to the port of embarkation. SDDC's Plans and Policy Directorate ensures port labor contracts are current, plans how equipment will be stowed on vessels, and coordinates with elements in the receiving theater for actions at the port of debarkation. Port call orders are generated within SDDC's Surface Tasking Order system, which provides visibility of these movements and ensures the JDDE is informed during the entire process.

The larger the scale of the movement, the more robust the process becomes. SDDC planners coordinate with USTRANSCOM to select sealift vessel types, including whether to use liners, charters, or activations. Coordination is then made to select the optimal seaport for force closure. They also coordinate with joint force elements on end-to-end surface movements, starting at the point of origin and continuing beyond seaport of debarkation.

Requirements with the Logistics Network

It is important to look at the genesis of requirements and how they flow through the JDDE from strategic planning, through refinement, predeployment activities, movement execution, and then reception, staging, onward

movement, and integration (RSOI) on the other end. As shown in figure 2, requirements are generated to support strategic goals as outlined in the National Defense Strategy, campaign plans, country plans, and theater posture plans. From this overarching framework, movement requirements begin to take shape in the form of exercises, rotations, and deployments, and then the sustainment requirements begin to formulate from the movement requirements.

From the initial requirements generation process, orders begin to take shape, and units are identified to support strategic requirements. This is typically when commercial industry partners first begin to play a role in the process, as movement requirements are entered into JOPES and forecast to provide advance notice, which is especially critical in today's environment of constrained global supply chains with high-resource demands.

The next stage is refinement and pre-deployment, where personnel across the JDDE work behind the scenes to refine plans and prepare to execute port-planning working groups to determine port pairs, contract development and solicitation to support movement, development of movement plans, and cargo preparation with predeployment checks at the installations. The single most critical event that happens at this stage is data validation,

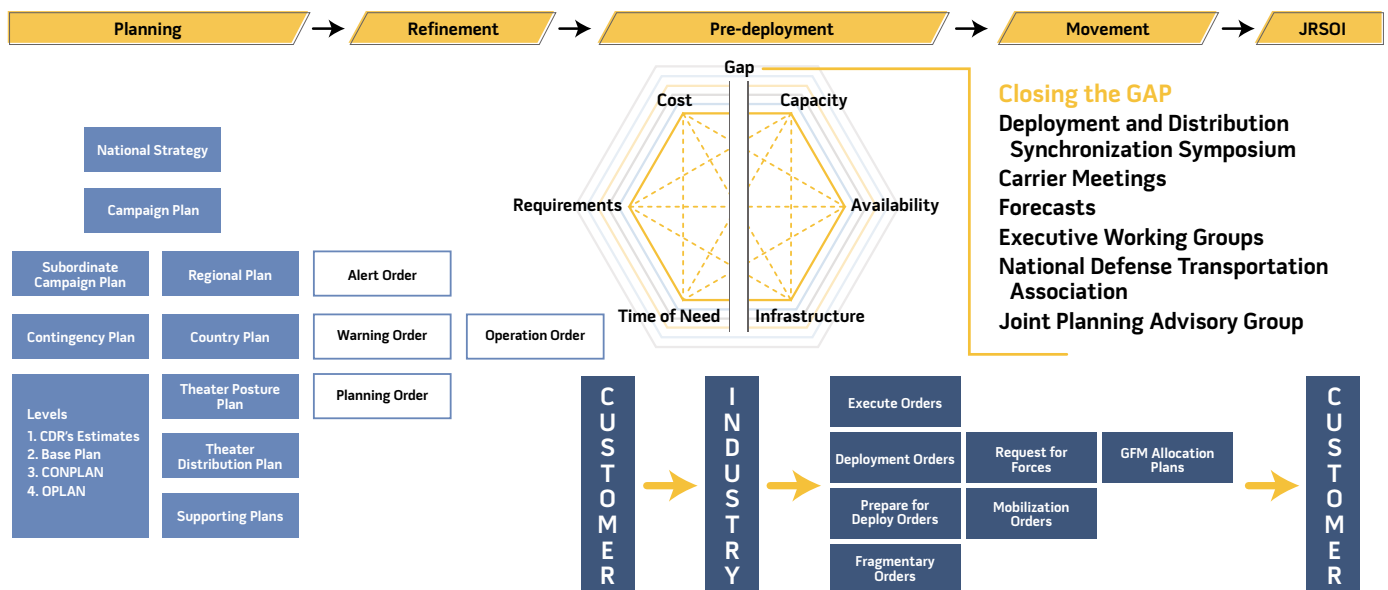
which sets wheels in motion that lead to cargo movement and eventually "rounds downrange" to begin RSOI.

It is important to keep several factors in mind during the decisionmaking process for sourcing lift for movement requirements. The six factors represented—cost, requirements, time of need, infrastructure, availability, and capacity—are among the most important from a surface perspective. None of these factors exists in a vacuum; each is connected to the other five, and stress on one factor will have rippling effects on the others.

On average, one in five unit moves has excess railcars ordered each year. Last year, there were 76 excess railcars ordered, potentially totaling \$3.7 million in excess cost to the government annually. Beyond the cost factor, a shortage of railcar availability could be created at other locations, impacting lift capacity and availability and causing a late delivery if there are not enough transportation assets readily available to absorb the requirements. On a larger scale, it may require the transportation provider to change port pairs or shift more cargo from one mode to another, therefore impacting the transportation infrastructure.

The shockwaves of such changes through the model can be significant, and the closer they occur to execution, the less agile, adaptive, and resilient the

Figure 2.



network becomes, and changes that occur along the continuum have a greater chance to be catastrophic. That is why detailed preparation is critical during the planning, refinement, and predeployment phases. We, as a community, need to put in the effort up front to develop plans that are as precise as possible. As the saying goes, measure twice, cut once.

SDDC is the third-party Department of Defense (DOD) logistics integrator. As an asset-light organization that relies almost entirely on commercial industry to provide transportation services, the command ensures that commercial partners are involved early and often in the planning process. SDDC personnel advise industry on transportation policy changes, legal developments, regulation updates, and more on a regular basis. Transportation programs are developed with commercial industry in mind because the more commercial-like SDDC and the customers can become, the easier it will be to obtain capacity at competitive rates, both in peacetime and during contingency.

In addition to unit movements and deployments, SDDC continues to push sustainment stocks through the JDDE daily. In any given month, SDDC moves 6,000 to 7,000 containers of sustainment cargo internationally. These movements are vital to sustaining U.S. forces globally with Defense Commissary Agency, Defense Logistics Agency, Naval Exchange Service Command, and Army and Air Force Exchange Service stocks and supplies. While these are often overlooked in the overall process of moving the joint force forward, these requirements are even more critical during contingencies.

The joint force requires significantly more transportation support during contingencies than in peacetime. For large-scale contingency operations, DOD could use as many as 22,000 railcar loads with 2,900 commercial and 1,300 Defense Freight Railway Interchange Fleet flatcars, with each railcar projected to make five trips over the course of deploying the entire force, with a maximum velocity of four armored brigade combat teams moving simultaneously. In addition

to rail, a total of 20,000 truckloads from 400 points of origin are projected, requiring over 5,000 trucks on peak operational days. For vessels, a total of 250 missions are projected, using nearly a dozen seaports and peaking at the use of nearly 20 berths simultaneously. While this is a massive increase in DOD requirements from current usage, it does not account for concurrent commercial activity. This stresses the importance of working closely with commercial partners to ensure as much information is prepared in advance to support movement requirements in the event of America's worst day.

Conclusion

Communication and coordination are key, now more than ever. Both have been more difficult to accomplish effectively over the past 2 years due to restrictions caused by the COVID-19 pandemic, but SDDC and DOD have persevered and adapted. As a result, relationships are stronger than ever. Across the continuum, the logistics community must collaborate effectively in the planning, refinement, predeployment, movement and RSOI phases, if we are to succeed and if our network is to remain resilient. While contingencies shorten the military's window to inform industry of large movements, planning and communicating the scope and scale of these moves can help offset the impact. Cost is tied to multiple factors, and we can actively work to offset the imbalance by effectively communicating requirements.

This relationship may experience bumps along the way; however, it is our partnership that ensures we have a strong network that guarantees the joint force is supported at all points of need. The bottom line is that, despite our best efforts, we will never be 100 percent accurate or precise. There will be changes, some minor and some major, and our model needs to be agile, adaptive, and resilient to absorb these changes with minimal impact on the warfighter. By communicating with industry across the continuum, we can fill gaps, make the model less rigid, and ensure the continued success of the Joint Deployment and Distribution Enterprise. JFQ

New from NDU Press

for the Center for the Study of Chinese Military Affairs

Strategic Forum 311
Rightsizing Chinese Military Lessons from Ukraine
By Joel Wuthnow



Analysts should question assumptions about whether, how, and to what effect the People's Liberation Army

is learning and adapting based on foreign conflicts. China's openness to learning might be less or different than it was in the 1990s. Many of the potential "lessons learned" from Ukraine confirm strategies the PLA has been considering for years, including joint operations, nuclear signaling to deter U.S. intervention, and achieving information dominance. A few potentially powerful lessons have received less attention: a reassessment of the PLA ground force's near-complete shift to battalions and brigades, insights on successful deception in a Taiwan scenario, and greater PLA focus on protracted conflict. If the PLA adopts these lessons, it could be less vulnerable to the U.S. and Ukrainian approaches that hindered Russia's offensive in 2022. However, there are numerous steps the United States and Taiwan can take to preserve advantages.



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Army Staff Sergeant Elise Denning, assigned to Artificial Intelligence Integration Center, conducts maintenance on unmanned aerial system in preparation for Project Convergence 21 at Yuma Proving Ground, Arizona, October 20, 2021 (U.S. Army/Destiny Jones)



Project Convergence

A Venue for Joint All-Domain Command and Control Experimentation

By James M. Richardson

You are doing a lot of experiments. Show me where it matters. Show me where connecting people and moving information-processing matters to an operational result.

—FRANK KENDALL III, SECRETARY OF THE AIR FORCE¹

What does the joint force need to do right now to succeed during future conflicts in

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2030, 2040, or beyond? The answer is clear: we must experiment *together*. We must assess the characteristics of the future operating environment (in terms of the physical environment, the threat, and the state of technology). We must develop, test, and refine con-

cepts for how we will operate in that environment. We must also develop and deliver joint capabilities that give our Servicemembers advantage over any adversary in that environment. None of this happens without experimentation. Together, we must learn,

fail, learn again, and fail again so that we eventually succeed.

We will fight as a joint team, so we must experiment as a joint team. We must experiment with and assess our ability to enable joint force commanders to execute Joint All-Domain Command and Control (JADC2). JADC2 is both the concept and the “capabilities needed to command the joint force across all warfighting domains and throughout the electromagnetic spectrum to deter and, if necessary, defeat any adversary at any time and in any place around the globe.”² This analysis must lead to action in terms of writing requirements and resourcing technology.

Some may not believe that it is possible for the Services to willingly collaborate in experimentation. I am more optimistic and cite Project Convergence (PC) as an example. For the past 2 years, the Army, Marine Corps, Navy, Air Force, Space Force, and U.S. Special Operations Command have worked together and collaborated in the name of integrated experimentation through PC. In this article, I describe how Project Convergence emerged as a venue for joint experimentation to inform the evolution of JADC2 from the tactical to operational levels of war.

First executed in the summer of 2020, Project Convergence originated as an annual capstone experiment to solve Army problems but not necessarily joint ones. The road to PC, though, began several years earlier when the Army established its core six modernization priorities and stood up eight cross-functional teams (CFTs), each led by a general officer or Senior Executive Service charged with supporting the delivery of these modernization priorities.³

In November 2018, then Secretary of the Army Mark T. Esper and Chief of Staff of the Army General Mark Milley published the Army Strategy (TAS), which established modernization as one of the Service’s four lines of effort. The others were to build readiness, reform, and strengthen alliances and partnerships.⁴ That same year, the Service established Army Futures Command (AFC) as its first new four-star

headquarters since 1973. Its mission is to synchronize and integrate modernization across the Future Force Modernization Enterprise.⁵ In addition to the CFTs, AFC received command authority over existing organizations, such as the Futures and Concepts Center, Joint Modernization Command, Research and Analysis Center, Combat Capabilities Development Command, and Medical Research and Development Command.

The Army’s laboratories and battle laboratories now fell under AFC. Each conducted significant amounts of materiel or conceptual experimentation. The question was where did this experimentation lead and how did it get integrated into the Army’s modernization priorities. The answer was disappointing; efforts did not necessarily lead anywhere and were not always nested with Army priorities. AFC, a single headquarters with unity of command over these laboratories and the ability to create unity of effort across the Army Modernization Enterprise, was now postured to solve this problem.

Project Convergence, which began as an idea on a white board back in early 2020, became the aim point for all the other experimentation. We sought to link Army sensors, command and control (C2) nodes, and shooters at the tactical level to enable faster decisionmaking under the premise of “whoever can see, understand, decide, and act first will win.”⁶ It pulled Soldiers, scientists, and industry together in the dirt for a month at Yuma, Arizona, to experiment with promising technologies under the pressure of tactical scenarios.

I am the first to admit that our experimentation during Project Convergence 2020 was rudimentary and ground-centric. We developed realistic tactical scenarios and integrated technologies such as robotic combat vehicles (air and ground), autonomy stacks, data fabrics, weapon-target-pairing technologies, and long-range precision munitions. Although we learned a great deal during PC20, our biggest takeaway was the need to include joint partners. We realized clearly that linking Army sensors, C2 nodes, and shooters was not sufficient; the experiment did not even reflect how we fight

now, let alone how we might fight in the future. No single Service will ever fight alone. We fight as a joint team. Moving forward, we needed to change PC.

As soon as PC20 ended, AFC began planning PC21, and we reached out to all our joint partners and invited them to participate and use PC21 to further their own experimentation objectives. Our premise was that the Army would provide the “sandbox,” and everyone was welcome to come play if they agreed to integrate their technologies across Services. They all accepted. PC21 and successive iterations would allow the joint force to discover, in the words of Chief of Staff of the Army General James C. McConville, “the speed, range and convergence of cutting-edge technologies that will be needed to provide future decision dominance and overmatch for great power competition.”⁷

As a mechanism to ensure that Service experimentation needs were being met, every month leading up to PC21 we convened a Joint Board of Directors (JBOD) that included three-star representation from each of the partners. Although the Army provided much of the overhead for PC21, each partner funded its own technologies and participation. PC21 experimentation focused on seven joint use cases agreed to by the JBOD. A use case is nothing more than a tactical scenario or problem. Joint Air and Missile Defense is an example. Each use case included combinations of sensors, C2 nodes, and shooters from across all Services. We knew that our biggest challenges were moving data and getting authority to operate, translators, and cross-domain-solutions for the 180-plus technologies to operate and share data on the Department of Defense network. Months prior to the experiment, the Services nominated the technologies they would bring into each use case, and AFC’s operational and systems architects began mapping those technologies together. We conducted multiple lab-based risk reduction events at the Joint Systems Integration Laboratory at Aberdeen Proving Grounds, Maryland, to validate our network design and ensure accurate end-to-end data flow.



Flight Systems Branch personnel from Army Aeromedical Research Laboratory demonstrate Load Stability System—Litter Attachment during hoist operations with 82nd Airborne's Integrated Visual Augmentation System—enabled air assault teams as part of Project Convergence 21 at Yuma Proving Ground, Arizona, October 26, 2021 (U.S. Army/Scott C. Childress)

Because of the joint governance we established, and tremendous hard work by Servicemembers, civilians, and industry partners in the labs and on the ground at Yuma and White Sands Missile Range, New Mexico, PC21 was a resounding success.

However, success is not only what we were able to accomplish on the ground in Yuma but also what we were not able to accomplish—and how that drove change. One of our biggest takeaways from PC21 was that we have not gotten it right with data. We tout that “data

is the new ammunition,” but as a joint force we remain unable to enter the battlespace and seamlessly exchange data to enable JADC2. We still leverage point-to-point data standards, some decades old. PC21 gave us the venue to identify multiple data standards that were insufficient for tomorrow’s fight and take those recommendation directly to the JADC2 CFTs for action, proving the value of a bottom-up approach to JADC2. Additionally, within the Army, the overhaul of the Service’s requirements process, to ensure system integration and data centricity are addressed prior to prototyping, has begun.

Other major lessons learned from PC21 have driven both the creation of new requirements documents and the adjustments to requirements documents already approved. PC21 identified the need to develop and enforce a common data standard, message format, and a single data fabric capability to achieve integration across the Services and amplify machine-to-machine speed. This finding has greatly informed the development of a requirements document to support a common data fabric (Project Rainmaker⁸). PC21 further refined the need for a joint integrated fire control network—Army Integrated Air and Missile Defense being the Service’s contribution to this fires network. PC21 also highlighted promising technologies ripe for transition from science and technology into the development of the Technology Maturation Initiative—automation of the target-weapons pairing process (FIRESTORM⁹) and tools that support increased decision speed for long-range effects (SHOT¹⁰). PC21 allowed Services to influence development of a joint common operating picture and improve joint all-domain situational awareness solutions.

Specifically, the Services were able to explore, test, and score the two-way transmission and interoperability of the Command Post Computing Environment as a potential replacement for the Global Command and Control System—Joint. This opportunity taught us that there is more work to be accomplished; none of the five potential

data fabrics tested displayed the required maturity, and cross-domain solutions to bridge information-sharing between Services improved interoperability but became single points of failure. Finally, PC21 reiterated the importance of the tactical network to everything the joint force does. PC21 has proved that the tactical network is the center of gravity in our operations and that we need to continue to evolve our network at the speed of relevance.

Project Convergence is also identifying capability shortfalls that support the need for Soldiers with emerging technical skill sets to support achieving the intent

of JADC2. This includes Soldiers with increased data science and agile software development proficiency to enable future combat operations. To meet this need, the Artificial Intelligence Integration Center (AI2C) and the Army Software Factory (ASWF) are identifying and recruiting Soldiers with technical talent from across the Service and teaching them to employ agile tools and data science to modernize mission operations and solve real problems. AFC will continue to guide and support organizations such as AI2C and ASWF to teach Soldiers with critical skill sets to prototype a future force design.

Frank Kendall III, Secretary of the Air Force, is right: we must experiment to connect people, process information, and create an operational impact. Project Convergence consistently reminds us that we must take a system-of-system approach and move away from strap-on solutions such as translators to achieve interoperability across Services. Instead, we must write our requirements aimed at achieving full integration of systems with the joint force and our allies.

Christine Wormuth, Secretary of the Army, and General McConville testified in May 2022 before the Senate Armed Services Committee that PC21 included



Army Private First Class Terry Hollywood, assigned to 224 Military Intelligence Battalion, conducts maintenance on MQ-1C Gray Eagle in preparation for Project Convergence 21 at Yuma Proving Ground, Arizona, November 11, 2021 (U.S. Army/Marita Schwab)

nearly 1,500 participants from the Army, Marine Corps, Navy, Air Force, and Space Force, making it the largest joint force experiment in 15 years.¹¹ PC is a key tenet of the experiment. The experiment gives the joint force opportunities to use any sensor, the best shooter, and the right C2 node to fuse data and accelerate sensor-to-shooter times. During PC we integrated the F-35B with ground shooters to complete the kill web. In other cases, we have increased the speed of sensor to shooter from minutes to seconds. Time and again, Project Convergence is providing a venue for Services to experiment with new technologies to solve significant operational challenges.

Despite the many successes and lessons learned associated with the Project Convergence campaign of learning, many criticisms and misunderstandings exist from across the joint force. Some question why the Army is leading a joint experiment. Others ask what the other Services are doing. Still others want to know if PC is simply a series of science experiments put together to see if they might work. Each Service realizes that experimentation is necessary to integrate our future platforms, and each conducts its own flagship experiment to contribute to JADC2—a domain and control system that connects existing sensors and shooters to data that is available in all domains. All are necessary, but PC offers a subtle and valuable difference by leveraging jointness in governance and execution across all domains.

As this article is published, we will be on the precipice of executing the third iteration of Project Convergence—PC22. PC22 will be a combined joint force experiment aimed at developing capabilities that can defeat adversaries in large-scale combat operations, building on the successes achieved last year by increasing the scale and complexity of the use cases. Additionally, PC22 welcomes some of our closest allies and partners as participants and observers. In January 2022, our JBOD expanded to become a Combined JBOD with partners from Australia, Canada, and the United Kingdom participating in addition to the Services.

PC22 centers on two scenarios. The first is an Indo-Pacific scenario experiment replicated on the West Coast of the United States at locations across the joint force. The second experiment is a European scenario that takes place in the southwest U.S. desert. In both scenarios, we insert and integrate hundreds of promising technologies and assess the scalability and capacity of the capability that those technologies provide and focus on where they fail.

We owe it to the Nation and to all Servicemembers who will be in harm's way in the future to conduct joint, integrated experimentation. Project Convergence has emerged as a venue to inform the evolution of JADC2. It is enabling us to achieve decision dominance by testing the speed, range, and convergence of cutting-edge technologies. Moreover, PC offers a framework to conduct experimentation across the joint force and with our allies and partners. We do not know when we will fight the next war, but the experimentation provided by Project Convergence ensures that we have the right military organizations with the right capabilities to achieve overmatch for Great Power competition. JFQ

Notes

¹ Air & Space Forces Association, "Air and Space Leaders in Action with Air Force Secretary Frank Kendall," video, 1:01:27, June 27, 2022, available at <<https://www.youtube.com/watch?v=pEshjxYEd-c>>.

² *Summary of the Joint All-Domain Command & Control (JADC2) Strategy* (Washington, DC: Department of Defense, March 2022), available at <<https://media.defense.gov/2022/Mar/17/2002958406/-1/-1/1/SUMMARY-OF-THE-JOINT-ALL-DOMAIN-COMMAND-AND-CONTROL-STRATEGY.PDF>>.

³ Ryan D. McCarthy and Mark A. Milley, "Modernization Priorities for the United States Army," October 3, 2017, available at <https://vtol.org/files/dmfile/10062017_Army_Modernization1.pdf>. This document established six Army modernization priorities: long-range precision fires, next-generation combat vehicle, future vertical lift platforms, Army network, air and missile defense capabilities, and Soldier lethality. Also see Army Directive 2017-24, *Cross-Functional Team Pilot in Support of Materiel Development*

(Washington, DC: Headquarters Department of the Army, October 6, 2017), available at <https://armypubs.army.mil/epubs/DR_pubs/DR_a/pdf/web/ARN6101_AD2017-24_Web_Final.pdf>. This directive established eight cross-functional teams: long-range precision fires; next-generation combat vehicle; future vertical lift; network command, control, communication, and intelligence; assured positioning, navigation, and timing; air and missile defense; Soldier lethality; and synthetic training environment.

⁴ *The Army Strategy* (Washington, DC: Headquarters Department of the Army, October 25, 2018), available at <https://www.army.mil/e2/downloads/rv7/the_army_strategy_2018.pdf>.

⁵ General Orders No. 2018-10, *Establishment of United States Army Futures Command* (Washington, DC: Headquarters Department of the Army, June 4, 2018), available at <[ARN11199_GO1810_FINAL.pdf](https://arn11199_GO1810_FINAL.pdf)>.

⁶ U.S. Army, "Project Convergence: A Campaign of Learning," video, 3:39, September 24, 2020, available at <<https://www.youtube.com/watch?v=VbReHneabGw>>.

⁷ "Army Releases Information Paper on Multi-Domain Transformation," U.S. Army Public Affairs, March 23, 2021, available at <https://www.army.mil/article/244543/army_releases_information_paper_on_multi_domain_transformation>.

⁸ Sydney J. Freedberg, Jr., "Project Rainmaker: Army Weaves 'Data Fabric' to Link Joint Networks," *Breaking Defense*, November 17, 2020, available at <<https://breakingdefense.com/2020/11/project-rainmaker-army-weaves-data-fabric-to-link-joint-networks/>>.

⁹ Kris Osborn, "Firestorm: We Watched the U.S. Army's New AI System Fight a Simulated War," *The National Interest*, September 26, 2020, available at <<https://nationalinterest.org/blog/buzz/firestorm-we-watched-us-armys-new-ai-system-fight-simulated-war-169669>>.

¹⁰ Ray Alderman, "How Rainmaker, Prometheus, FIRESTORM, and SHOT AI Algorithms Enable the Kill Web," *Military Embedded*, December 23, 2021, available at <<https://militaryembedded.com/radar-ew/sensors/how-rainmaker-prometheus-firestorm-and-shot-ai-algorithms-enable-the-kill-web>>.

¹¹ Statement by The Honorable Christine E. Wormuth, Secretary of the Army, and General James C. McConville, Chief of Staff United States Army, Before the Committee on Armed Services, *On the Posture of the United States Army*, U.S. Senate, 117th Cong., 2nd sess., May 5, 2022, available at <https://www.army.mil/e2/downloads/rv7/aps/aps_2022.pdf>.



Esira Naidrodro (right), customs officer with Fiji Revenue and Customs Service, and Epironi Turaganivalu (second from right), fisheries assistant with Ministry of Fisheries, Fiji, conduct boarding of China-flagged fishing vessel off coast of Fiji, April 18, 2022, along with other Fijian team members and U.S. Coastguardsmen from USCGC *Munro* (U.S. Coast Guard/Nate Littlejohn)

Pivoting the Joint Force

National Security Implications of Illegal, Unregulated, and Unreported Fishing

By Scott C. Apling, Martin Jeffery Bryant, James A. Garrison, and Oyunchimeg Young

Exclusive economic zones (EEZs) are areas that extend 200 nautical miles from a country's coast and are "reserved to the respective country

under the United Nations Convention on the Law of the Sea . . . [and where] the coastal countries retain special rights of exploration and use of marine

resources."¹ Tensions arise among nation-states when the claiming rights to EEZs are blurred and fishing fleets ignore the regulations sanctioned by international organizations.

Illegal, unreported, and unregulated (IUU) fishing exploits states, weakens regimes, and presents "one of the greatest threats to marine ecosystems due to its potent ability to undermine national and regional efforts to manage fisheries

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Drug interdiction team from guided-missile destroyer USS *Momsen* boards and seizes fishing vessel, May 16, 2022, while transiting international waters in Gulf of Oman (U.S. Navy/Lily Gebauer)

sustainably.”² IUU fishing in EEZs and international waters is a facet of Great Power competition; it jeopardizes global security as state and nonstate actors engage in competition and confrontation over an increasingly scarce resource. The IUU fishing industry disrupts sustainable food sources, upsets the already fragile ecosystem, endangers global fishing stocks and food access, creates tensions among nation-states, and threatens geopolitical stability—all of which could lead to armed conflict. In September 2020, the commandant of the U.S. Coast Guard (USCG) proclaimed, “IUU fishing has replaced piracy as the leading global maritime security threat.”³

This article examines how the Department of Defense (DOD) is working to eradicate IUU fishing and its efforts in the geographical areas of responsibility, assesses the relationship between Great Power competition and

IUU fishing, and considers ways to manage the future challenges of IUU fishing. It further explores DOD’s roles and responsibilities in counterdrug operations and how the best practices from these efforts could be applied to suppressing one of the most concerning security threats to the global maritime environment today.

The Food and Agriculture Organization (FAO) of the United Nations and other international government and nongovernmental organizations have developed regulations to govern commercial fishing. However, IUU fishing is an international problem with increasing global impacts, and finding better ways to effectively enforce these regulations has been challenging.

A key challenge in stopping IUU fishing is amassing the level of resources needed to prevent an activity that transcends geographic boundaries. The number of vessels engaged in both

legitimate and illegal fishing significantly exceeds the number of resources available to effectively police waters and enforce regulations; the International Maritime Organization estimates the total number of fishing vessels in the world at around 4.6 million.⁴ This challenge is directly correlated to a lack of funding for counter-IUU activities. IUU fishing is just one of many threats to security on any nation’s priority list, and the means to address it are always in competition for funding with other national security issues. Last, and perhaps most important, there is an absence of leadership to spearhead a global effort to address IUU fishing. Not all nation-states or international committees share the same fishing regulations, and sensitive diplomatic issues surround claims to certain EEZs. Although these challenges are broad and complex, DOD can leverage its capabilities and partnerships to assume a greater role in combating IUU fishing.

DOD contributes to the counter-IUU-fishing efforts across the globe primarily through multilateral endeavors aimed at promoting rules-based activities in the maritime domain. Furthermore, DOD works through bilateral partnerships with like-minded states. In the Indo-Pacific region, U.S. Indo-Pacific Command (USINDOPACOM) participates in multilateral actions such as the Quadrilateral Defense Coordination Group, a collaborative effort among Australia, France, New Zealand, and the United States to improve maritime security in the South Pacific, and Operation *North Pacific Guard*, a multinational enforcement operation among Canada, Japan, South Korea, Russia, and China.⁵ USINDOPACOM also partners with several Pacific Island states to execute bilateral enforcement, primarily through law enforcement agreements in which partner law enforcement officers embark U.S. warships to enforce fishery laws within a host country's EEZ.⁶

Off the coast of South America, in the eastern Pacific, U.S. Southern Command (USSOUTHCOM) partners with states to combat IUU fishing.⁷ Similar cooperation occurs in the North Atlantic, where U.S. Northern Command partners with Canadian forces. In West Africa, U.S. Africa Command enables partners “to build maritime security capacity and improve management of their maritime environment through real-world combined maritime law enforcement operations” as part of the Africa Maritime Law Enforcement Partnership.⁸

DOD recognizes the challenge posed by IUU fishing but continues to struggle to marshal the resources necessary to counter such a large-scale problem effectively. IUU fishing also presents DOD with a dilemma because its complex nature spans the boundary between law enforcement and traditional military activities. However, DOD must consider expanding its role in combating IUU fishing; doing so is aligned with the 2018 National Defense Strategy objective to build a more lethal force to, among other things, “defend U.S. interests from challenges below the level of armed conflict.”⁹

The Need to Prioritize the IUU Fishing Threat

IUU fishing is an aspect of Great Power competition that is likely to assume increasing importance as a growing world population continues to demand a robust seafood supply. China is already engaging simultaneously in state-sponsored IUU fishing to further its influence and initiatives that support a rules-based-order approach to IUU fishing. On the other hand, Russia generally supports multilateral counter-IUU fishing efforts, but it attempts to leverage the militarized fishermen model pioneered by China as the Arctic becomes more strategically and economically significant.

The Chinese Communist Party (CCP) has militarized its fishing fleet since the establishment of the People's Republic of China in 1949, and it created the People's Armed Forces Maritime Militia as a critical part of its emerging naval capabilities in the years that followed.¹⁰ The party has regularly relied on fishing trawlers for maritime operations ever since, using them as troop transports and also as a means of asserting sovereignty over contested waters, most notably the South China Sea.¹¹ China's use of fishermen to achieve strategic goals thus aligns with overarching Chinese strategy, which David Kilcullen describes as “conceptual envelopment,” whereby:

an adversary's conception of war becomes so much broader than our own that two dangerous things can happen. First, that adversary may be acting in ways it considers warlike, while we with our narrower notion of warfare remain blithely unaware of the fact, so by the time we realize we are at war, we have already lost. Second, and what is even more dangerous, we can be taking actions that we define as normal peacetime competition, while a rival with a broader concept of conflict sees these as acts of war and responds accordingly.¹²

China's state-sponsored fishing activities represent an aspect of the current competitive environment and a potential realm for unintended escalation should

the United States and its allies fail to understand and address them effectively.

Fishing is essential to China's economy and population. According to the FAO, China accounted for 35 percent of global fish production in 2018.¹³ China's population is also a major consumer of fish, and any significant degradation of global fisheries would be a key concern for the CCP. Most notably, China maintains the world's largest deep-water fleet and plays an outsize role in international waters far from the Chinese mainland. A major concern is the Chinese distant-water fishing fleet's relationship with the Chinese government. According to a recent article by Ian Urbina from the Yale School of the Environment, “Chinese fishing boats are notoriously aggressive and often shadowed, even on the high seas or in other countries' national waters, by armed Chinese coast guard vessels.”¹⁴ These formal ties between China and its distant-water fishing fleet are troubling, especially given that China could exploit the fishing fleet to achieve its national security objectives and global expansion.

IUU fishing presents a dilemma for China. It provides an avenue of competition in which China enjoys many advantages compared with states that abide by the rules-based international order. However, its support of fishermen engaged in IUU fishing may provide minimal economic benefit at the cost of alienating states in Africa and Latin America that China is otherwise courting. This is irresponsible state behavior, and the United States has taken note. In an October 2020 statement, former National Security Advisor Robert O'Brien announced, “The People's Republic of China's illegal, unreported, and unregulated fishing, and harassment of vessels operating in the exclusive economic zones of other countries in the Indo-Pacific, threatens our sovereignty, as well as the sovereignty of our Pacific neighbors and endangers regional stability.”¹⁵

IUU fishing is likely to expand in scope and scale as worldwide fisheries face growing pressure and incentives for fishermen to increase illegal behavior. IUU fishing is already contributing to instability in fragile regions such as West

Africa, with detrimental impacts on critical economic sectors and food prices. The overall estimate of economic impacts is as high as \$50 billion a year as of 2009.¹⁶ Similar impacts are likely across the Indo-Pacific region as well.

Armed incidents between states will likely increase as fishermen range farther afield to improve their catches. Confrontations between increasingly militarized fishing fleets from China, Vietnam, and the Philippines will likely continue—if not increase in frequency—creating the potential for inadvertent escalation into a regional conflict.¹⁷ Similar situations are likely to occur around Africa and throughout the eastern Pacific. Russia may also take best practices from China’s successes in the South China Sea to encourage IUU fishing in the Arctic to expand its sovereignty in what is an increasingly contested environment. These are all concerning possibilities that DOD must take into account when considering a pivot of the joint force’s efforts toward combating IUU fishing.

Counterdrug Operations as a Model

The United States has dedicated resources to the counterdrug effort since the early 20th century. In 1914, Congress passed the Harrison Act, which was the first Federal anti-narcotics legislation.¹⁸ The Harrison Act was adopted in response to an increase in drug use across the country and to the antidrug campaigns of progressive reformers and evangelicals. In principle a tax law, the Harrison Act pushed drug suppliers into the drug-smuggling business; it did little to curb rising drug use across the country. As a result, in 1930, the Federal Bureau of Narcotics, the precursor to the Drug Enforcement Administration, was established. Unfortunately, this agency did little to prevent the flow of drugs into the country; nor did it curb drug use. During President Richard Nixon’s first term, his administration took the bold step of declaring an “all-out offensive” on drugs. This was the official birth of modern counterdrug efforts in the United States.

The strategy that was initially adopted, and that has remained unchanged across 5 decades, is two-pronged, aiming for reduction of both supply and demand. Every administration since Nixon’s has adopted this same strategy, but President Ronald Reagan took significant steps toward advancing and institutionalizing DOD’s support for the war on drugs with National Security Decision Directive 221 (NSDD 221), which declared drug trafficking a national security threat. NSDD 221 authorized the Secretary of Defense to take measures that would “enable U.S. military forces to support counternarcotics efforts more actively.”¹⁹

The effort put forth to conduct counterdrug operations is global and involves numerous nations, agencies, and military branches. Joint Publication 3-07.4, *Counterdrug Operations*, provides doctrinal advice to the force on supporting counterdrug operations.²⁰ USSOUTHCOM and USINDOPACOM exercise day-to-day operations through joint interagency task forces (JIATFs) that conduct detection and monitoring and counterdrug operations within their respective operational areas. Most of these counterdrug operations focus on the maritime environment.

The current gold standard for U.S. counterdrug operations is the one conducted by JIATF South. The task force is a counterdrug task force subordinate to U.S. Southern Command responsible for countering the flow of illicit trafficking by providing operational, intelligence, and security cooperation support to a wide array of domestic and international partners. JIATF South is a team of teams. Although it is composed primarily of DOD personnel, representatives from the Department of Homeland Security and Department of Justice support the task force. Moreover, 12 countries spanning Latin America and Europe are fully integrated into the task force, providing the unique capabilities and access of the international community to combat the flow of illicit traffic.²¹ In addition, the United Nations is greatly involved in counterdrug operations. Also, numerous drug-related

treaties codify the international response to drug trafficking.

There are many similarities between the maritime drug-trafficking and IUU fishing threats, and DOD can apply best practices and lessons learned from supporting counterdrug operations to advance counter-IUU-fishing efforts. The modes of conveyance used for IUU fishing and the smuggling of illegal drugs in the maritime environment are similar, and in both cases the illegal activity transcends political boundaries. Both IUU fishing and drug smuggling are also global concerns. According to the USCG’s vision to combat IUU fishing, “1 in 5 fish caught around the world is thought to have originated from IUU fishing.”²² The arrests and successful prosecutions of the human networks responsible for facilitating IUU and drug-trafficking activities serve as another critical component to suppressing these illegal activities. Without successful prosecutions, criminal networks will continue to offend. Not only do arrests and prosecutions disrupt these criminal networks, but they also lead to acquiring valuable intelligence from those arrested. Such intelligence improves operational planning, which ultimately produces more interdictions. Successful prosecutions of offenders also provide incentives to law enforcement agencies to partner with and fully support DOD task forces.

Large-scale IUU fishing is a transnational organized crime and must be recognized and treated as such.²³ In some cases, IUU fishing may be conducted in one (or more) nation-state’s waters but orchestrated in another’s and might be led by a sophisticated transnational organized crime group. The United Nations Convention against Transnational Organized Crime lists an organized criminal group as “a structured group of three or more persons, existing for a period of time and acting in concert with the aim of committing one or more serious crimes or offenses established in accordance with this Convention, in order to obtain, directly or indirectly, a financial or other material benefit.”²⁴ IUU fishing can be described

as a “convergence crime,” a crime in the course of which other criminal activities meet. According to independent research agency RUSI, numerous crimes are linked to IUU fishing, including money laundering, tax fraud, document fraud, corruption, drug trafficking, labor violations, human trafficking, and forced labor.²⁵ The Department of State’s 2016 *Trafficking in Persons Report* gives the example of selling Rohingya and Bangladeshi migrants into forced labor aboard fishing boats.²⁶ There are other documented incidents of migrant smugglers selling their charges into modern slavery aboard IUU fishing vessels.²⁷ IUU fishing is inextricably tied to organized crime and, as a convergence crime, it has many parallels to drug trafficking. The United States must recognize that IUU fishing is a security risk and apply the lessons learned from counterdrug operations to combating IUU fishing.

A primary lesson learned from DOD’s support of counterdrug operations over the past five decades is that for an endeavor to be successful, there must be a concerted effort by all parties to conduct operations jointly and internationally. The oceans are too vast for any one agency to address the threat without enlisting intergovernmental and international partner nations. In the USCG’s September 2020 *IUU Fishing Strategic Outlook*, Coast Guard Commandant Admiral Karl Schultz stated:

*We know such international cooperation works: for 25 years, the six nations which contribute to the enforcement efforts of Operation North Pacific Guard have confronted illegal high seas driftnet fishing operations. Our collective efforts have been overwhelmingly successful in nearly eliminating illegal high seas driftnet fishing in the North Pacific Ocean.*²⁸

Recommendations

For nearly 40 years, DOD has utilized a JIATF construct to combat the threat of illegal drugs entering the homeland, consistently producing exceptional results.²⁹ DOD has refined this model over the decades to efficiently integrate U.S. and partner nation militaries and law enforcement to detect, deter, disrupt, and interdict thousands of narco-traffickers. This has been no easy feat, especially given the number and diversity of participating partners and agencies, the massive amounts of tactical information exchanged, and the different mechanisms used to reach a successful end game. The efficient prosecution of the narco-traffickers, a critical part of the JIATF construct success loop, is another noteworthy piece of the process that ensures the cycle of success repeats itself.



Coastguardsmen from USCGC *Glen Harris* recover bags of illegal narcotics discarded by fishing vessel interdicted in Gulf of Oman, May 31, 2022 (U.S. Coast Guard)

The DOD flagship counterdrug task force, JIATF South, has the complex mission of detecting and monitoring illicit trafficking throughout its operating area to facilitate international and interagency interdiction in support of national and partner-nation security.³⁰ JIATF South's vision is to be the center of excellence for its mission, and it has achieved that vision in many respects. A 2019 Government Accountability Office report highlights JIATF South's success: "From fiscal years 2014 through 2018, the rate at which JIATF South successfully detected and handed off smuggling events for interdiction was generally 70 percent or higher."³¹

JIATF South's success with employing ships and aircraft from DOD, the Department of Homeland Security, and foreign partners to detect and monitor the trafficking of illicit drugs can be attributed to its ability to deploy the unique capabilities of a well-constructed joint, interagency, and international partnership to maximum effect. This collaboration model is ideal for use in the creation of a JIATF aimed at detecting and monitoring IUU fishing to facilitate interdictions and apprehensions.

The illegal importation of drugs erodes a country's economic, governmental, and environmental nodes. The same could be said of IUU fishing, which damages the global fishing stock, jeopardizes food access, and, most concerning, creates tensions among nation-states and threatens geopolitical stability—all of which could lead to armed conflict. Given the impact IUU fishing is having on many nations across the globe, DOD should consider establishing a JIATF specifically tasked to counter IUU fishing.

A DOD task force integrated with law enforcement and like-minded international partners would be able to leverage their capabilities to provide detection and monitoring support to interdict vessels engaged in IUU, expand fishery enforcement cooperation among the international community, and develop the international community's capacity to counter irresponsible fishing practices. This could be the linchpin that unites the international community to suppress one of the more concerning security threats to the global maritime environment today.

IUU fishing requires a multinational approach because it is a global issue, and the United States cannot act unilaterally. DOD recognized this reality when it established JIATF South and integrated the interagency community and partner nations into its mission planning and execution. An IUU fishing JIATF would have to follow suit. In its *IUU Fishing Strategic Outlook*, the USCG announced its commitment to lead "a global effort to combat illegal exploitation of the ocean's fish stocks and protect our national interests."³² And one of the USCG's enduring missions is the at-sea enforcement of U.S. laws and international treaties to conserve living marine resources and their habitats.³³ Therefore, the ideal leader for an IUU-fishing-centric JIATF would be a USCG flag officer. A complementary codirector should be a representative from the National Oceanic and Atmospheric Administration (NOAA)'s Office of Law Enforcement, which is the lead Federal agency tasked with enforcing domestic fishery laws and supporting international treaties.³⁴ The USCG and NOAA have worked together for more than 200 years and cosigned a cooperative maritime strategy in 2013 to formalize their relationship.³⁵ Because of their understanding of both the maritime enforcement mission and the IUU fishing threat, a combined USCG and NOAA leadership team would be well postured to effectively lead the task force.

The directorates' composition within the JIATF would need to be structured to leverage DOD, law enforcement, and partner-nation capabilities to combat IUU fishing. A blend of U.S. and partner-nation militaries and law enforcement to support the various functions (administration, planning, information technology, and so forth) of the JIATF would be optimal. However, the directorates of operations and intelligence should be led by senior DOD officers. The operations directorate would be responsible for the tasking of DOD air and surface resources to detect and monitor vessels suspected of IUU fishing. The intelligence directorate would be responsible for providing all-source intelligence analysis on the current and intended

locations of IUU fishing fleets to drive the operations directorate's assignment and placement of resources. Once a target was located, the JIATF would work with the relevant law enforcement agencies (for example, USCG, NOAA, partner nations) to interdict the vessel.

Upon appropriate enforcement action, information would be derived from the boarding to assist the JIATF with planning for future operations. Most important, such information would help law enforcement officials disrupt the criminal networks that facilitated the illegal activity. Building partner capacity would be another essential mission for a DOD-led IUU fishing JIATF. This is a critical effort primarily because better-trained and better-equipped nations can better combat IUU and become less reliant on external assistance. To address this objective, a directorate should be formed within the JIATF to support, train, and develop partner-nations' capacities to counter irresponsible fishing practices.

To address the global IUU threat, JIATFs could be placed at all geographic combatant commands (GCCs) to serve as the executive agents for DOD support to law enforcement for IUU fishing. This would be a logical implementation; the existing counterdrug JIATFs (JIATF South and JIATF West) reside at USSOUTHCOM and USINDOPACOM, respectively. As is the case with JIATF South and JIATF West, the size and scope of the IUU fishing JIATF should be proportional to the scale of the threat within the applicable GCC. JIATF South's organization and nodes of support are more robust than JIATF West's, primarily because of the volume of the drug flow in the Western Hemisphere and direct threat to the homeland. The same logic would apply for an IUU fishing JIATF at USINDOPACOM; its area of responsibility consists of 36 nations and over 50 percent of the world's population.³⁶ Moreover, the Asia-Pacific region produces 75 percent of the world's seafood.³⁷

Cynics might argue that DOD's plate is full and that it does not have the bandwidth or the budget to



Member of Royal Jordanian Navy conducts counter-illegal fishing training aboard patrol craft in Gulf of Aqaba during International Maritime Exercise/Cutlass Express 2022, February 9, 2022 (U.S. Navy/Dawson Roth)



U.S. Coastguardsmen assigned to USCGC *Stratton* question Taiwan fishing vessel crew during illegal, unreported, and unregulated fishing operations in Pacific Ocean, February 2, 2022 (U.S. Coast Guard/Sarah Stegall)

establish another JIATF dedicated to countering illegal fishing. However, today’s national security challenges are dynamic, forcing DOD to continuously realign its priorities to address the world’s most concerning threats. The Maritime Security and Fisheries Enforcement (SAFE) Act, passed in December 2019, established DOD as one of 21 agencies fully integrated into a whole-of-government working group to combat IUU fishing.³⁸ The working group convened for the first time in July 2020 and as part of its discussions considered the inclusion of “counter-IUU fishing exercises in the annual at-sea exercises conducted by the Department of Defense.”³⁹ The working group also identified the need to develop a strategy to enhance the use of “shiprider” agreements among DOD, USCG, and partner nations to address illegal fishing.

It is evident that the foundation for DOD’s commitment to combat

IUU fishing has already been built, and establishing a counter-IUU fishing JIATF would meet one of the SAFE Act’s highest priorities: “to develop holistic diplomatic, military, law enforcement, economic, and capacity building tools to counter IUU fishing.”⁴⁰ After realigning its priorities and reallocating resources, DOD could begin the process of establishing JIATFs focused on IUU. According to former Secretary of Defense Mark Esper, “there are a number of things we can do to keep our adversaries off balance, to improve our own readiness at the same time, that don’t necessarily involve massive infusions of dollars.”⁴¹ Creative thinking and resourcefulness could be the secret ingredients necessary to up DOD’s game so it could become fully committed to countering an activity that not only undermines marine ecosystems and economic growth, but also threatens maritime security on an international level.⁴² JFQ

Notes

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Navy corpsman assigned to 3rd Battalion, 2nd Marines, applies tourniquet on simulated casualty during counter assault exercise in Okinawa, Japan, May 11, 2022 (U.S. Marine Corps/Micha Pierce)

The Strategic Survivability Triad

The Future of Military Medicine in Support of Combat Power

By George A. Barbee

A man cannot understand the art he is studying if he only looks for the end result without taking the time to delve deeply into the reasoning of the study.

—MIYAMOTO MUSASHI

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Future conflicts will be complex and will occur in multidomain environments. This problem requires a solution to protect the force. The answer is the deliberate convergence of

three existing and distinct overarching medical concepts employed in the chain of survival. These three critical medical concepts combined—henceforward introduced as the Strategic Survivability

Triad (SST)—are early intervention, rapid control of noncompressible hemorrhage, and early blood administration. The SST will provide the force with a sustainable capability needed in future conflicts to enable combat power projection, improve survivability, and mitigate risk. In addition, this will provide options for commanders and policymakers in the attainment of national objectives.

The newly conceptualized SST seems rudimentary but is analogous to combined arms warfare, joint warfighting, or blitzkrieg operations, where overarching concepts or capabilities combine to create synergistic effects. The beauty of the SST is that it is generalizable for all conflict types and supported by current evidence-based medicine. This article provides solutions and actionable information for the current and future military (some of which can be employed immediately) and to two Key Strategic Issues List areas, “High-Intensity Conflict” and “Modernization.”¹ The SST background is discussed, critical points are illuminated by case reports with analysis, and recommendations are provided.

The intended audiences are key leaders and decisionmakers at the operational to strategic level who can influence the Services and joint warfighting enterprise. These include nonmedical and medical personnel and combat, combat service, and combat service support personnel. The goal is to impose the SST in the chain of survival to mitigate the fog and friction of war to improve the survivability of the warfighter and positively affect the planning and execution of campaigns to achieve strategic objectives.

Background: This Is a Strategic Endeavor (the Why)

Employing the SST will unequivocally improve survivability, yet several challenges impede its implementation. First, there is a misguided belief or overreliance on the Golden Hour concept.² The Golden Hour is a good starting point for patient evacuation, but the military can do better with a combined early intervention and early evacuation approach. Second, the military has

acknowledged the problem of noncompressible hemorrhage, but unrelenting research, data collection, and development are needed to solve this problem set. There are potential options on the horizon in materiel and training, but development and implementation cannot waver. Finally, a concerted effort to adopt the practice of early blood administration is required. There is a potential concern that any blood transfusion is dangerous and has risks. However, the risk associated with blood transfusion is low when juxtaposed against amphibious or airborne joint forcible entry operations against peer or near-peer adversaries.

All battlefields are nonlinear, encompassing multidimensional, multidomain, simultaneous, dynamic, fluid, and layered systems.³ This clarification is necessary because it relates to the chain of survival and the application of military medicine, its adjuncts, and the support required. The SST will close the gap between the echelons of battlefield medicine and adjunct Tactical Combat Casualty Care (TCCC), and can bridge Prolonged Casualty Care, with the caveat that without good TCCC and the SST, there will be no opportunity to practice Prolonged Casualty Care.⁴

Tactical Combat Casualty Care has excelled in the tactical space by bridging tactical medicine and science with the laudable goal of eliminating preventable death on the battlefield.⁵ The SST employed in the strategic space is vital to saving lives and will aid in executing combat power, especially when coupled with ongoing advancements in battlefield medicine.

Overall mortality rate in the recent conflicts in Afghanistan and Iraq (and throughout history)—directly proportional to weapon lethality—is redressed by the SST. Despite a 25 percent rate of potentially preventable death,⁶ many studies in the early 21st century tout that the United States has achieved unprecedented survival rates for casualties arriving to combat hospitals.⁷ This low mortality rate is directly related to dominating nonpeers and is associated with weapon lethality in Afghanistan and Iraq. The SST’s employment will translate to

more lives saved, preserving the fighting force and increasing strategic resolve to pursue national objectives.

Although known about for years, the Golden Hour concept was not universally resourced until nearly a decade into the campaigns in Afghanistan and Iraq. In June 2009, Secretary of Defense Robert Gates’s directive for operations in Afghanistan prioritized strict adherence to keeping casualty evacuation times under an hour. This directive aspired to achieve parity with medical evacuation (MEDEVAC) operations in Iraq.⁸ The Gates memo was a move in the right direction for the care of wounded U.S. Servicemembers, translating to 359 lives saved between 2009 and 2014.⁹ Further examination revealed earlier time-to-treatment and evacuation translated to increased survival rates. Evidence-based medicine dictates that early intervention improves casualty outcomes in civilian and military medicine. These data are well worth revisiting because they illuminate hard-learned medical lessons over the past 20 years of conflict and will direct the time-to-treatment dilemma that needs to be overcome.¹⁰

The peacetime effect, or Walker Dip,¹¹ is a repeated historical cycle marked by decreased medical capability at the onset of conflict, leading to poor outcomes and then markedly improving.¹² Hard-learned medical lessons are often lost, forgotten, and relearned during the current or next conflict.¹³ This is important to note because operational military medicine evolves slowly. Evidence-based changes have been slow and incremental, lack parallelism, and at times have to be relearned. Military medicine’s slow progress—and resulting loss of lives—has been a primary concern and a source of frustration for battlefield surgeons for over 50 years.¹⁴ Over the last 20 years of conflict, the U.S. military medical system’s materiel advancements having the most significant impact in saving lives on the battlefield were the tourniquet and the use of whole blood. Ironically, the tourniquet and whole blood, which have been used for over 400 and 100 years, respectively, have recently been rediscovered.¹⁵

Analysis of combat casualty care data from 2001 to 2017 for the conflicts in Afghanistan and Iraq showed decreased case fatality rates (a measure of the overall lethality of the battlefield) from 20 percent to 8.6 percent and 20.4 percent to 10.1 percent, respectively (supporting the peacetime effect and Walker Dip theories).¹⁶ In addition, data reveal that the use of tourniquets, blood transfusions, and rapid evacuation translated to a 44.2 percent mortality reduction.¹⁷ This implies that to improve survivability, the SST must be adopted and ingrained within the joint force's DNA. The SST is a joint endeavor and requires the enterprise to solve, mandate, and implement its course. The Joint Trauma System (designated as the Department of Defense Center of Excellence for Trauma)

showcases this effort and works this problem set on behalf of the force and the Military Health System.¹⁸

The August 26, 2021, attack on Servicemembers at Hamid Karzai International Airport is a sobering but reassuring example of why and how the SST is vital to the preservation of the joint force. The disposition of medical forces favored the static employment of the SST. More blood and treasure would have been lost had not the array of medical assets and resources favored the SST.¹⁹

Operational Medicine Case Reports with Analysis

Early Intervention (the Evidence).

One of the three concepts of the SST is to provide early battlefield interven-

tion within minutes of injury. Early intervention can be categorized as early treatment, early transport to a higher level of care, or a combination of those actions as the scenario dictates. There is a wealth of medical evidence and examples where most trauma patients benefited from the correct balance of early treatment and rapid transport. For example, a study conducted in 1982 of patient stabilization in the field and its effect on mortality for penetrating heart injuries showed an 80 percent survival rate if transport times were minimized.²⁰ This study was a small civilian-based effort but foreshadowed a better understanding of the effect of time and mortality, especially on penetrating cardiac injuries.

In-Flight Traumatic Arrest

*I never truly understood the finality of death . . . until death came for me.**

During a night assault conducted on a remote target in below-freezing temperatures, a U.S. special operations Soldier sustained multiple gunshot and fragmentation wounds to the chest.† While under fire, two special operations medics immediately initiated care at point of injury. Although not overtly appreciated through visible, active hemorrhage, the casualty sustained a significant internal injury to his thorax. Visible wounds were dressed, intravenous access was obtained, and a unit of freeze-dried plasma (FDP) was reconstituted for administration.‡

On further examination of the casualty and treatment of his chest wounds, his respiratory rate increased, and he began to develop difficulty breathing. The medics immediately recognized the emergent need for chest needle decompression and delivered seven serial interventions to relieve the bilateral tension pneumothoraces that had developed. This scenario occurred over 5 minutes, the casualty became difficult to arouse, lethargic, and symptoms of shock began to develop. At this point, the medics administered Tranexamic acid and FDP, with an improvement of mental status.§ The casualty was moved through rugged terrain to an extraction site, reevaluated, given packed red blood cells, and transported to an awaiting expeditionary tactical surgical element.¶

On receipt of the casualty, a quick examination confirmed what the medics had relayed on patient transfer and noted extremely low blood pressure, very high heart, and breathing rates—all evidence of significant injury. After placing two chest tubes and experiencing a loss of 2,400 milliliters of blood from the chest cavity, the patient's condition deteriorated, and immediate preparations were made for emergency surgery. Due to the sub-freezing conditions, surgery was performed in a hypothermia prevention bag, and, on initiation, the casualty underwent a traumatic arrest. The chest cavity was quickly opened, a gunshot wound was identified in the left lung and clamped, and the heart was uninjured but void of blood. Blood products were administered rapidly while the heart was massaged. After 7 minutes, the patient's heart resumed activity, and spontaneous circulation returned.** This Soldier is currently studying to be a trauma surgeon to "cobble together some type of honorary repayment to the people who gave his own life back to him just a few short years ago."††

* Ramin Khalili, "Opening Remarks Deliver Purpose, Emotional Power at 2019 MHSRS," Army Medicine, available at <https://www.army.mil/article/226069/opening_remarks_deliver_purpose_emotional_power_at_2019_mhsrs>; Robert Walker, "Ranger Medic Remarkable Save," video, 2:16, available at <https://www.youtube.com/watch?v=3yGOXV1k_r0>.

† Personal discussion with Colonel David R. King, MD, FACS, Trauma and Acute Care Surgeon, Massachusetts General Hospital Trauma Center, October 15, 2020.

‡ Myles R. McKenzie et al., "A Case of Prehospital Traumatic Arrest in a U.S. Special Operations Soldier: Care from Point of Injury to Full Recovery," *Journal of Special Operations Medicine* 16, no. 3 (2016), 93.

§ Tranexamic acid (TXA) is an antifibrinolytic drug. Early administration of TXA has been shown to safely reduce the risk of death in bleeding trauma patients when administered under 3 hours of injury. CRASH-2 collaborators et al., "The Importance of Early Treatment with Tranexamic Acid in Bleeding Trauma Patients: An Exploratory Analysis of the CRASH-2 Randomised Controlled Trial," *The Lancet* 377, no. 9771 (March 26, 2011), 1096–1101.

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Further examination of 11 years of civilian statewide trauma system data demonstrated that 95 percent of trauma patients requiring surgical intervention benefited most with intervention within 23 minutes.²¹ That data showed the best survival benefit in patients seen within 19 minutes after suffering penetrating trauma, a corollary to combat trauma.²² Extending the intervention times to 59 minutes for all traumas and 39 minutes for penetrating trauma would translate to 50 percent mortality.²³

Another study focused on combat casualty data from Iraq between 2003 and 2010 concluded that improved casualty

outcomes resulted from increased pre-hospital capability, provider expertise, and reduced time to surgical care.²⁴ In 2018, the Johns Hopkins University School of Medicine assessed 2,329,446 records (103,029 of which were included for analysis), comparing survival times of patients suffering from penetrating trauma transported by ambulance versus privately owned vehicles. They compared data from over 298 urban trauma centers and found that arrival by private vehicle transport is associated with greater survivability than ambulance transport. This study was a real test of the “scoop and run”²⁵ (private vehicle

transport) system.²⁶ This study ultimately illuminated that trauma patients suffering from penetrating injuries transported by private vehicles to a trauma center had significantly higher survival rates than their counterparts transported by ground ambulance systems. This study also demonstrated decreased transport times for patients—a core tenet of SST—equals more significant survival benefit. This seemingly simple problem—time to treatment—is disguised as a tactical issue but has strategic implications that affect the joint force. The fog and friction of war have direct effects on time. These confounders have adverse effects on



Alaska Army Guardsmen from Detachment 2, Golf Company, 2nd General Support Aviation Battalion, 104th Regiment, rehearse medical evacuation procedures with Army Alaska paratroopers from 1st Squadron, 40th Cavalry Regiment (Airborne), 4th Infantry Brigade Combat Team (Airborne), 25th Infantry Division, during medical evacuation and hoist familiarization training, at Landing Zone Ranger on Joint Base Elmendorf–Richardson, Alaska, February 20, 2019 (U.S. Army National Guard/Balinda O’Neal Dresel)



U.S. Marines with 3rd Reconnaissance Battalion, 3rd Marine Division, load simulated casualty onto UH-1Y Venom assigned to Marine Light Attack Helicopter Squadron 369 during casualty evacuation training on Kin Blue, Okinawa, Japan, March 3, 2022 (U.S. Marine Corps/Jerry Edlin)

simple actions such as intravenous access, spinning up a MEDEVAC or casualty evacuation, or loading and unloading patients. These will create delays in care if not rehearsed and practiced.

The linchpin of any trauma system revolves around its ability to positively influence the entire continuum of care. Unequivocally, early medical intervention and timely evacuation of severely wounded casualties are imperative to saving lives. The key to this principle is that the wounded must survive long enough for early care, active medical intervention, and timely evacuation. The military must align efforts to produce that effect. It is important to note that 87 percent of U.S. military deaths occurred in the prehospital setting; more important, 24 percent of those deaths were deemed potentially survivable.²⁷ A study published in 2019 that examined combat casualty data from Afghanistan and Iraq between

2001 and 2017 showed a 7.5 percent survival benefit in casualties transported within 60 minutes. Put another way, early patient transport prevented 275 additional deaths, or one-third of a battalion's worth of firepower. Coupled with a simple intervention of tourniquet use (which was associated with a 12.9 percent decrease in mortality), the survival benefit increased to 749 patients, or a battalion-equivalent fighting force.²⁸ As noted, a well-operationalized trauma system consists of a continuum of care, access to prehospital care, effective communications, rapid triage, transport to care, and finally, rehabilitative services.²⁹ Optimal survival outcomes for trauma patients are realized from increased prehospital expertise and capability coupled with decreased surgical intervention time.

Noncompressible Hemorrhage (the Evidence). Another concept of the SST is hemorrhage control, namely

noncompressible hemorrhage (NCH).³⁰ Unfortunately, NCH remains the leading cause of death on the battlefield.³¹ Life-threatening hemorrhage is a time-dependent problem, and trauma management is a matter of pressure and physics.³² Hemorrhage can be classified as compressible or noncompressible. Compressible hemorrhage is "tourniquet-able," or controlled by direct pressure, while NCH is not tourniquet-able, and direct pressure is not overtly accessible due to anatomic location. During the Vietnam War and the conflicts in Afghanistan and Iraq, hemorrhage was responsible for deaths in 44 percent and 42 to 55 percent of combat casualties, respectively.³³

Warfighters have used tourniquets to control compressible hemorrhage in tourniquet-able injuries for centuries. The first recorded battlefield use of the tourniquet occurred during the Siege of

Besançon in 1674, during the Franco-Dutch War, to control bleeding before surgery.³⁴ The U.S. military employed tourniquets from the Civil War to the Vietnam War. Despite evidence, it was believed that tourniquet use would likely result in amputation of the injured limb, and the harmful effects of tourniquets outweighed the benefit.³⁵ Task Force Ranger's experience in Somalia reinvigorated tourniquet use for its effectiveness at quickly controlling hemorrhage.³⁶ Seemingly anachronistic, tourniquet use to quickly control hemorrhage has been proven to save lives throughout military history and revalidated throughout the current conflicts in Afghanistan and Iraq.

NCH, or non-tourniquet-able injuries, has been a challenge for the military for many years but has only been highlighted as problematic in the past 10 years. An article published in 2010 highlighting recommendations to decrease combat casualty deaths noted that the

problem of NCH needs to be addressed to prevent death in the military prehospital setting.³⁷ A landmark article published in 2012 that reviewed Afghanistan and Iraq battlefield trauma data from 2001 to 2011 showed that most casualties (87.3 percent) died in the prehospital setting. A further extrapolation of that data showed that 75.7 percent of those injuries were deemed nonsurvivable, while 24.3 percent were classified as potentially survivable.³⁸ Hemorrhage was the leading cause of death of the potentially survivable casualties, and of those, 13.5 percent were tourniquet-able injuries while 86.5 percent were not.³⁹ A further study reviewed 15,209 U.S. battle injuries from 2001 to 2012 and identified that NCH created a significant mortality burden in combat casualty and recommended a prehospital solution be sought.⁴⁰

The problem of NCH is evident in the civilian trauma community as well. In the U.S. civilian setting, injury is the leading

cause of death between the ages of 1 and 44 years, and NCH is second only to head injury for lethality.⁴¹ The first civilian study of the problem of NCH was completed in 2013. It reviewed 3 years of trauma data from the U.S. National Trauma Data Bank and showed a 44.6 percent mortality rate associated with NCH.⁴² These articles illuminate the clear and present gap of NCH control, which has been a persistent problem throughout warfare. By understanding battlefield mortality (and its corollaries in civilian trauma) and the implication of NCH on survivability, the enterprise can begin to appreciate the explicit requirement for the SST.

Early Blood Administration (the Evidence). The last component of the SST is early blood administration, preferably whole blood (WB).⁴³ Blood and blood products, notably WB,⁴⁴ are vital components in combat casualty care, prolonged care settings, and Damage Control Resuscitation and Surgery

In-Flight REBOA

*The loss of perfusion was confirmed with lack of carotid pulse.**

A small, dynamic, and highly mobile expeditionary surgical element faced a dilemma.[†] While forward staged in support of combat operations in a remote location, the team was alerted about a severely injured casualty. Arriving to the patient via rotary-wing aircraft within 27 minutes from time of injury, the team quickly began Damage Control Resuscitation while in flight. On examination, the medical team noted that the patient had a cricothyrotomy in place, a fast (and weak) carotid pulse, and decreased cardiac activity (noted on ultrasound examination).[‡] The team also noted an entrance wound to the right side of the face with an exit wound to the right posterior skull. On confirmation of good airway establishment, the casualty lost vital signs, and the team started chest compressions.[§]

After resuscitation with cardiac medications, packed red blood cells, and Low Titer O Whole Blood, the patient had a return of spontaneous circulation (ROSC). The patient then suffered another loss of pulses, and the team again began aggressive resuscitative measures. After another ROSC, the team, under ultrasound guidance, on a rotary-wing platform, and in low illumination, placed a Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA)[¶] catheter in the left femoral artery.^{**}

The current Joint Trauma System Clinical Practice Guidelines describe the use for REBOA in penetrating abdominal, pelvic, or junctional injuries in hypotensive patients (systolic blood pressure <90) or traumatic arrest patients.^{††} In this case, REBOA was used to improve hemodynamic instability due to hemorrhagic shock that is not currently outlined in standard practice with the intent to maintain adequate brain perfusion. The point is that a well-trained medical team can perform this difficult procedure (or other lifesaving interventions) under arduous, dynamic, and extreme conditions to save lives on the battlefield.

* Shaun R. Brown et al., "Successful Placement of REBOA in a Rotary Wing Platform Within a Combat Theater: Novel Indication for Partial Aortic Occlusion," *Journal of Special Operations Medicine* 20, no. 1 (2020), 34.

† Personal discussion with Lieutenant Commander Shaun Brown, U.S. Army surgeon, October 16, 2020.

‡ Cricothyrotomy (cricothyroidotomy) is a surgical airway made in a life-threatening circumstance where an incision is made through the skin and cricothyroid membrane.

§ Brown et al., "Successful Placement of REBOA in a Rotary Wing Platform Within a Combat Theater," 34.

¶ Resuscitative Endovascular Balloon Occlusion of the Aorta is a catheter with an inflatable balloon inserted into the femoral artery and used to occlude large blood vessels to assist in temporary hemorrhage control.

** Ibid.

†† Joint Trauma System (JTS) Clinical Practice Guidelines ID 38, *Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) for Hemorrhagic Shock* (Washington, DC: JTS, March 31, 2020).

(DCRS).⁴⁵ These products, including WB, are safe, crucial elements for combat casualty care, improve survivability on the battlefield, and quickly transform into a walking blood bank (WBB).⁴⁶ WB has been used in combat from World War I to the Vietnam War.⁴⁷ Between March 1967 and June 1969, approximately 364,900 transfusions were recorded in Vietnam, with only 38 significant reactions (1:9,600), demonstrating its safety profile.⁴⁸ More recent battlefield data indicate that prehospital blood product transfusion given within minutes of injury was associated with greater 24-hour and 30-day survival benefit versus delayed transfusion or no transfusion.⁴⁹ Another study of Afghanistan and Iraq combat casualty care data from 2001 to 2017 showed that early blood administration prevented 873 deaths, translating to the overall prevention of 23.8 percent additional deaths.⁵⁰ These current findings support that prehospital transfusion in

the combat casualty care environment improves survivability.

The use of WB is an unequivocally superior lifesaving product in combat casualty care, civilian-related trauma, and DCRS.⁵¹ Also, fresh WB can be drawn from a pool of identified personnel (donors), given immediately (in extremis at or near the point of injury), or stored for up to 24 hours for later use. A study published in 2020 reviewed data from 2016 to 2019 of 15 successful transfusions of cold-stored low titer O whole blood (LTOWB)⁵² at point of injury and determined its feasibility.⁵³ WB donors can be screened with tandem blood drawn and the blood stored or transported for up to 35 days to optimize the WB supply network. The simplest and safest method for operational use is identifying and screening a pool of LTOWB donors (approximately 21 percent of the population) and forming a dynamic walking blood bank to bridge this gap. WB is

peerless as a resuscitative fluid for trauma, and it is a safe transfusion product capable of transforming into a dynamic WBB and improving battlefield survivability.

Aeromedical evacuation and logistics will be challenged on the future battlefield, especially in large-scale combat operations. Resupply of blood and blood products has relied on fixed-wing and rotary-wing resupply, yet U.S. rotary-wing assets have not been used in a peer-on-peer or near-peer conflict.⁵⁴ Threats and challenges presented by adversaries and the operational environment justify the requirement of WB in the current and future battlefield at or near the point of injury.

The U.S. capability to conduct resupply in semipermissive and nonpermissive environments has atrophied.⁵⁵ The need to access, store, transport, deliver, thaw, and administer blood components on the battlefield due to the cold-chain requirements and logistical tail for current blood therapy will prove challenging for the

Whole Blood at Point of Injury

Novel and extreme techniques including far forward "buddy transfusions"

A 33-year-old Active-duty Ranger suffered a significant right-sided complex blast injury from an improvised explosive device during combat operations in a remote location in Afghanistan.[†] He suffered substantial soft tissue injuries, massive internal injuries to his lungs and abdomen, and significant blood loss. Under cover of darkness and under fire, he was immediately stabilized by medics who, within minutes, immediately placed tourniquets, a pelvic binder, relieved life-threatening pulmonary injuries, initiated intravenous access, and gave Tranexamic acid. The Ranger was given four units of cold-stored whole blood (CSWB), and then the unit activated their Ranger group O low titer walking blood bank.[‡] While still engaged in active combat, three units of fresh whole blood (FWB)[§] were drawn from co-located unit members who were pre-identified and prescreened.[¶]

Two units of FWB were given on the ground. The other unit collected was administered on the casualty evacuation aircraft (with two additional units of CSWB) en route to an awaiting Forward Resuscitative Surgical Detachment.^{**} The Ranger underwent a significant resuscitative and surgical course in the days that followed. On post-injury day 3, he arrived at the San Antonio Military Medical Center under the Extracorporeal Membrane Oxygenation team's care and transport.^{††}

* Clayton J. Lewis et al., "Fresh Whole Blood Collection and Transfusion at Point of Injury, Prolonged Permissive Hypotension, and Intermittent REBOA," *Journal of Special Operations Medicine* 20, no. 2 (Summer 2020), 125.

† Personal discussion with Lieutenant Commander Ryan Knight, Regimental surgeon, 75th Ranger Regiment, August 26, 2020, and October 15, 2020.

‡ Walking blood bank (WBB) is a pool of pre-identified and prescreened blood donors called on in extremis for emergency blood donation.

§ Fresh whole blood is whole blood collected on an emergency basis from a WBB. Joint Trauma System (JTS) Clinical Practice Guidelines (CPG) ID 21, Whole Blood Transfusion (Washington, DC: JTS, 2018).

¶ JTS CPG ID 21, Whole Blood Transfusion, 123.

** The Forward Resuscitative and Surgical Detachment is a military medical element designed to provide far forward damage control resuscitation and damage control surgery to stabilize casualties for further medical evacuation to the next higher role of medical care. Army Techniques Publication 4-02.25, The Medical Detachment, Forward Resuscitative and Surgical (Washington, DC: Headquarters Department of the Army, December 2020), 1-1.

†† Lewis, "Fresh Whole Blood Collection and Transfusion at Point of Injury, Prolonged Permissive Hypotension, and Intermittent REBOA," 124; Lucas Tomlinson, "Almost Impossible Mission: The 8,000-Mile Nonstop Flight to Save a U.S. Soldier's Life," Fox News, available at <<https://www.foxnews.com/us/almost-impossible-mission-the-8000-mile-non-stop-flight-to-save-a-us-soldiers-life>>; Oriana Pawlyk, "They Weren't Gonna Stop: Inside the 8,000-Mile Race to Save a Wounded Soldier's Life," Military News, available at <<https://www.military.com/daily-news/2019/09/28/they-werent-gonna-stop-inside-8000-mile-race-save-wounded-soldiers-life.html>>.

joint force. The current and future operational environment makes it necessary to treat and sustain combat casualties in a dynamic setting for extended periods. The gap lies in blood logistics in the combat casualty care and prolonged care settings in the current and future operating environment and the full spectrum of joint force operations.⁵⁶

Recommendations and the Art of the Possible (the How). Variables that may affect casualty outcomes are weapons effects, casualty numbers, weather, geography, illumination, national and strategic goals in risk mitigation, enemy composition, disposition, capability, and capacity.⁵⁷ It is important to note that the best medicine on the battlefield is fire superiority. Still, the SST's employment as a contributor to the chain of survival will improve outcomes of combat casualties when the joint force overmatch is challenged. The current juncture has provided overwhelming combat trauma data, and the Nation's military will be best served by synthesizing Joint Trauma System lessons.

Focusing on the human-centric physical, cognitive, and spiritual domains is

foundational to the SST and joint force survivability. Note that all the elements discussed above and in figure 1 are human-centric, not materiel-centric. As new treatment protocols are introduced, people will still be required to train and be trained, perform the interventions required, and decide to be at the right place at the right time to save the most lives. From this foundational approach, four lines of effort arise in convergence to build ready and responsive forces for the joint force: optimize human performance, eliminate preventable death on the battlefield, develop medical leaders, and promote the health of the force. The military must maximize every opportunity to improve battlefield care and seek opportunities to remain dynamic and agile to create a solution.

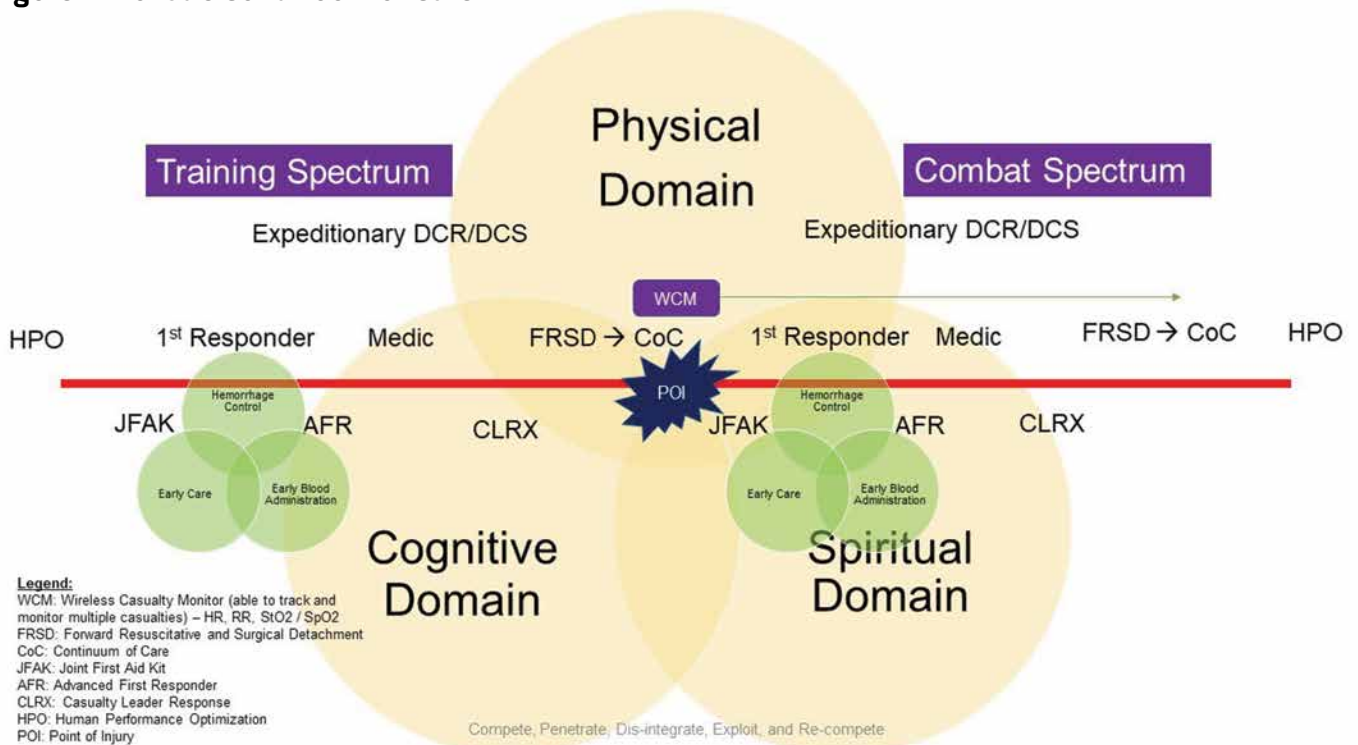
Implementing the SST is a clarion call to action requiring awareness of the problem, identification of gaps, and a deliberate method to mitigate these gaps. Here, one can either choose to be a zealot or a martyr, and zealots are needed in the pursuit of joint force survivability. The SST goes hand in hand with the building

blocks of TCCC: prevent injury (through cognitive, physical, and spiritual conditioning), mitigate injury extent (through contingency training and personal protective equipment), and optimize care of the combat casualty (through flawlessly executed TCCC).⁵⁸ The following recommendations for the SST provide a framework for the military to improve the joint force's survivability. They are provided in three time frames: near-term (present to 2 years), mid-term (3 to 5 years), and far-term (5 years or more).

Recommendations

Early Intervention. Risk is inherent in every military operation, and mitigating the risk to mission, force, and the command by medical design is requisite in planning. Early care or evacuation happens not by circumstance but by deliberate planning, training, and effort. Unfortunately, some medical personnel (providers and planners alike) will separate medical readiness from healthcare delivery. This only creates confusion and division; one cannot be effective without the other.

Figure 1. Holistic Continuum of Care



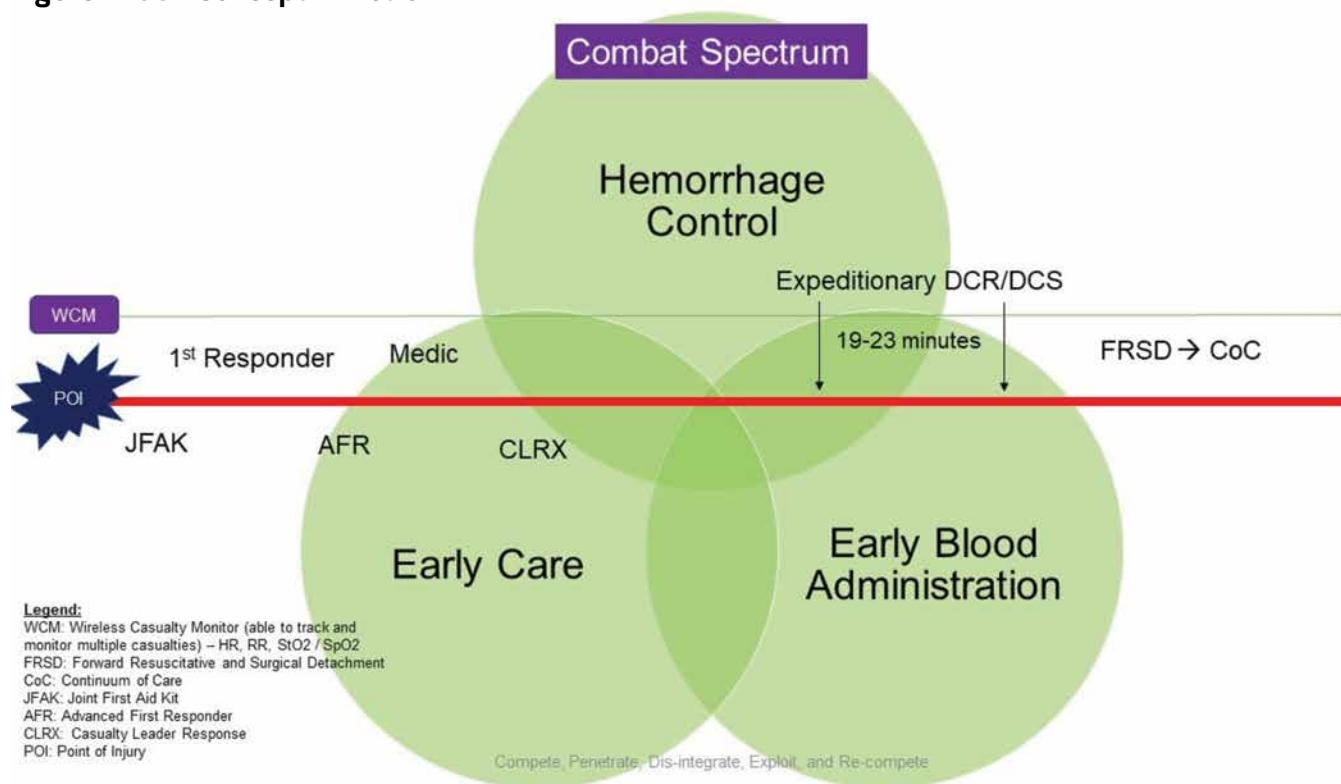
Near-term. Integrate fundamental elements of SST into existing organizational structures. Make TCCC ubiquitous, trained, and employed across the joint force. Ensure that a unit casualty response system is codified, implemented, and rehearsed at the tactical and operational levels. This response system should outline standards for nonmedical personnel, medics, leaders, and casualty transport, and should cover actions for one or many casualties.⁵⁹ Train military medics to the highest

level capable. The essential principle of this training is to be overtly capable of delivering a live, warm, and noncoagulopathic patient to surgical care as quickly as possible and maintain that level of competence.⁶⁰ Ruthlessly pursue metrics that evaluate eliminating preventable death on the battlefield and care of the combat casualty.

Mid-term. Continue to cultivate strategic partnerships with the American College of Surgeons and the Military Health System (in conjunction with

the Defense Health Agency) to further enhance civilian-military relationships to create training platforms for the sustainment of critical wartime skills. This will cultivate a culture of optimizing care for the injured patient and establish greater civilian-military medical collaboration. This will also inculcate the principles of a learning organization. In addition, continue to enable, enhance, and develop medical strike teams that focus on highly mobile and expeditionary DCRS. These medical strike teams can

Figure 2. SST Concept in Action



A brigade-size ground force element (GFE) with multifunctional capability contacts an enemy force during hours of limited visibility. The GFE sustains multiple casualties in the initial moments of contact. First responders immediately begin to control overt bleeding. The advanced first responders (AFR), assigned one per squad, assist in bleeding control, obtain intravenous access, and perform casualty warming. Moments later, the medic arrives, assesses the situation, places wireless casualty monitoring and tracking devices (WCM) on the casualties. These WCMs are linked to the medic's smart device and provide predictive analysis of casualties' status and outcomes, simultaneously sending a status update or ping to the ground force commander and the joint force headquarters. This ping alerts the continuum of care enterprise, most importantly, a medical strike team. The joint battle staff are also pinged to ensure global that integration of combat power, anticipated blood requirements, logistical concerns, and transportation needs are synchronized for the GFE. The GFE has now mounted a counterassault, initiated their casualty response plan, and cross-domain synergy has provided layered effects for lethality, protection, and survivability. The GFE begins to target, degrade, and eliminate the enemy force. Within minutes, the medic and the AFR have bleeding controlled, blood products are being delivered to the sickest casualties, packaging for movement, and the medical strike team is en route with an anticipated arrival time of N+20 minutes to provide care and transport, platform agnostic. The ping sent via the WCM can also communicate across the continuum of care and to U.S.-based facilities and the Joint Trauma System to facilitate care and anticipate patient holding and movement requirements and continuous performance improvement.



Navy corpsmen assigned to 1st Marine Division activate Valkyrie blood transfusion under supervision of evaluators during expeditionary medical integration course, Camp Pendleton, California, May 5, 2022 (U.S. Marine Corps/Dana Beesley)

be adaptive to any role of care but are flexed and optimized to concentrate in the spaces between doctrinally defined roles of care on the battlefield.⁶¹ These medical strike teams can also be leveraged to assist in operational and strategic evacuation, providing mobile or expeditionary DCRS on various platforms. The medical strike teams can also accompany contact, blunt, or surge forces to support calibrated force posture, enhance multidomain formations, and optimize convergence by leveraging time, space, and joint force capabilities. Develop simple autonomous casualty tracking devices that are interoperable across the continuum of care. These devices should employ vital signs and provide predictive analysis of patient outcomes but not increase caregiver cognitive load at any level of care. Drone evacuation of patients will enhance casualty transport and push medical and nonmedical

“speedballs” forward to enhance logistical reach.⁶² The logistical speedballs can be managed by predictive analysis through artificial intelligence/machine-learning support to optimize early and, if required, supportive medical care.

Far-term. Develop devices that are both diagnostic and therapeutic and are semiautonomous to autonomous. The current military medical market is replete with diagnostic devices, but devices that can provide a solution and lifesaving interventions will be required for the future hyper-dynamic environment. This is not unlike the current Automatic External Defibrillator, which, with some fundamental training, a layperson can operate to save a life. A simple example would be an ultrasound device that detects a chest injury and simultaneously provides the necessary intervention. In addition, consider using Extracorporeal Membrane Oxygenation or other far-forward

resuscitative and surgical efforts targeted at those previously termed *nonsurvivable*, which comprise 52.1 percent of acute pre-military treatment facilities deaths that occur within minutes to hours.⁶³

Noncompressible Hemorrhage Control. Aggressively and actively pursue an NCH solution at the national level and by the joint force and potentially led by the Joint Trauma System. As discussed, NCH is a problem for both military and civilian traumatologists; this implies an opportunity for a synergistic solution and action. What may be required is a fresh perspective that is not anchored by the confines of looking at the same conundrum to confront an old and persistent problem.

Near-term. Ensure that every medic is equipped and adequately trained in treating NCH with approved external compression devices.⁶⁴ Next, employ resuscitative endovascular balloon



U.S. Airmen assigned to Special Operations Task Force—East Africa Critical Care Air Transport Team perform medical casualty care response exercise from Camp Lemonnier, Djibouti, to tactical forward operating base in East Africa, July 3, 2021 (U.S. Air Force/Daniel Asselta)

occlusion of the aorta (REBOA) at the lowest yet safest level possible.⁶⁵ Some restraint must be used for this capability, but balance risk versus reward in terms of lives saved through objective assessment. Simple training in early identification, problem recognition, and employment of a bleeding control bundle⁶⁶ has been demonstrated to decrease mortality by up to 30 percent.⁶⁷ An initial balance may span or even be found between noninvasive, minimally invasive, and invasive procedures. Ensure providers charged with DCRS can perform REBOA. Ensure medical providers are engaged in medical and surgical practices at high-volume/high-acuity centers to prepare to provide these interventions.

Mid-term. Focus aggressively on efforts that can arrest NCH. Look outside the scope of medicine and consider projects or proposals that demonstrate good scientific merit for hemorrhage control. Streamline the research and development process. Presently, there are potential

NCH products that have been under research and development for more than 8 years. Develop adjunct therapies that can improve intrinsic coagulation.

Far-term. Invest in promising nanotechnology, nanofibers, and tissue-targeted therapy that arrest hemorrhage.⁶⁸ Incentivize and challenge military and civilian combat casualty care research. Divest of minimally or nonproductive portfolios and redundant programs. Promote seedling research and consider phased research that is uncertain yet holds great promise.

Early Blood Administration. The evidence confirming that WB is the resuscitation fluid of choice for the combat casualty suffering from traumatic injury is unequivocal. Those who refute the evidence are anchored by inherent bias. This bias only creates friction for WB use and limits the potential to save more lives. Ensure that the Joint Trauma System is staffed and resourced to drive innovative solutions and possesses the ability to

collaborate with civilian partners. A key strategic partner is the Armed Services Blood Program; continue to empower it to create novel solutions and policies.

Near-term. Blood, preferably WB, should be carried at the lowest medical level possible and available throughout the continuum of care. This implies a new but not unsolvable logistical project. At the tactical level, combat medics, corpsmen, combat paramedics, and medical technicians (collectively hereafter referred to as “medics”) and providers must be trained to carry, store, draw, and administer WB at or near the point of injury and through the continuum of care. Training should also emphasize the storage and delivery of blood and blood products across the continuum. Update current Department of Defense policy to reflect changes in blood delivery enhancement and transfusion and work toward a shared understanding with the Food and Drug Administration to bring this critical capability to fruition. Ensure blood

compatibility (ABO typing) testing is accurate and screen and identify LTOWB donors for employment as universal donors. For the joint force, this would be a dynamic walking blood bank. A translational example for replication in the joint force for operational use is a carrier strike group, operated by approximately 7,500 personnel equaling a donor pool of about 1,575 personnel providing WB through prescreened donors to support unified land operations.⁶⁹ Finally, a solid understanding of WBB requirements and employment needs to be shared across the military. This can be achieved through global integration.

Mid-term. Work across the joint, interagency, intergovernmental, and multinational environments for novel solutions to extend the shelf life, carrying capability, carrying capacity, and delivery of blood and blood products across the tactical through strategic environments. Examples include (but are not limited to) bio-enhancement, bioengineering, refrigeration, and storage. Seek and create novel solutions to extend the shelf life of blood and blood products. Other capabilities include enhanced delivery of blood for the military. These could come in the form of enhanced aerial delivery, drone delivery, casualty drone backhaul, or robotic delivery.

Far-term. Leverage science and technology to look at the possibility of farming or harvesting blood. For example, seek capabilities to draw one unit of blood from a donor and turn that unit into two or more WB units capable of transfusion. The CRISPR (clustered regularly interspaced short palindromic repeats) and CRISPR-Cas9 (CRISPR associated protein 9)⁷⁰ genome editing tools can be used to enhance the capability of blood through the expression of factors that may benefit the sickest or most injured combat casualties. These recommendations need further research and a shared understanding with authorities that manage regulatory requirements, thus necessitating a bridging and mitigation strategy. If the enterprise placed equal effort on this as it did for COVID-19 vaccine development, we could be positioned for a solution.

Conclusion: A Clarion Call to Action

The Strategic Survivability Triad begins with the chain of survival and integrates three overarching medical concepts—early intervention, rapid control of noncompressible hemorrhage, and early blood administration. The SST's value and relevance for the military are justified by providing current evidence-based medicine and analysis. Holistically operationalizing the SST will save lives and improve combat casualty care. The SST will also enhance the chain of survival in multidomain operations and the continuum of war, support the full actualization of combat power, and realize U.S. strategic objectives, all while preserving the joint force. The careful array, employment, and convergence of the SST will immediately and unequivocally improve the joint force's survivability on the current and future battlefield while mitigating risk.

The United States is seemingly entering an interwar era. There has never been a more critical and necessary time than now for military medical innovation, ingenuity, and action. The interwar period is where hard-learned medical lessons cyclically and mercilessly fall prey to the peacetime effect or the Walker Dip. These lessons are lost, forgotten, or even doubted. In contrast, military medical leaders must redouble efforts in analysis, research, application, and training in the interwar era to improve trauma readiness and outcomes through evidence-driven performance improvement.⁷¹ This task has been given to the Joint Trauma System but needs to resonate throughout the medical force to fill in the gaps of the Walker Dip.

Over the last 20 years, robust work has been done on collecting, analyzing, and publishing combat casualty data. Translation of that data into actionable solutions is the next step. More than ever, the urgent and direct need for revolutionary medical action is required to save lives on the battlefield and decrease the mortality and morbidity of the joint force. This is a clarion call to action. Some have advocated that national commitment to research is required to continue

advancing trauma care outside of warfare, even in areas that, despite sparse data, may offer great promise to lives saved.⁷² The framework outlined in the zero-preventable deaths landmark report will provide strategic direction.⁷³ Academic, medical, and scientific collaboration with like-minded and zealous civilian partners will amplify the joint force's battlefield survivability. Ensuring battlefield survivability is an ongoing no-fail mission. Operationalizing the SST into a strategic pursuit will require zeal, vision, and acceptance; our nation deserves no less. JFQ

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Notes

¹ Steve Cunningham, *Key Strategic Issues List (KSIL) 2021–2022* (Carlisle, PA: U.S. Army War College Press, July 7, 2020), available at <https://press.armywarcollege.edu/cgi/viewcontent.cgi?article=1403&context=articles_editorials>.

² The *Golden Hour* is a medical term with the premise that an injured patient has 60 minutes from the time of injury to receive definitive care. After 60 minutes, mortality and morbidity dramatically increase.

³ Aaron Mehta, “No Lines on the Battlefield”: Pentagon’s New War-Fighting Concept Takes Shape,” *Defense News*, August 14, 2020, available at <<https://www.defensenews.com/pentagon/2020/08/14/no-lines-on-the-battlefield-the-pentagons-new-warfighting-concept-takes-shape/>>.

⁴ Richard N. Lesperance, Steven Adamson, and Jennifer M. Gurney, “Lessons Learned During Prolonged Care of Combat Casualties by a Minimally Manned Surgical Team,” *Military Medicine*, July 17, 2021.

⁵ *Tactical Combat Casualty Care (TCCC)* refers to trauma management guidelines used in the operational setting. Its focus is on preventable death resulting from combat.

TCCC is the Department of Defense (DOD) standard of care for first responders (medical and nonmedical). The TCCC All Service Member course replaced Service trauma skills currently taught in first aid and self-aid buddy care courses, per DOD Instruction 1322.24, *Medical Readiness Training* (Washington, DC: DOD, March 16, 2018).

⁶The term *preventable death* denotes control of external hemorrhage, relief of airway obstruction, and relief of tension pneumothorax. The term is nearly synonymous with potentially survivable injuries. *Potentially survivable injuries* imply opportunities for performance improvement while preventable death may be perceived as wrongdoing. See Brian J. Eastridge et al., “Death on the Battlefield,” *Journal of Trauma and Acute Care Surgery* 73, no. 6, suppl. 5 (2012), S435; Russ S. Kotwal et al., “Eliminating Preventable Death on the Battlefield,” *Archives of Surgery* 146, no. 12 (2011), 1350–1358.

⁷Robert L. Mabry and Robert DeLorenzo, “Challenges to Improving Combat Casualty Survival on the Battlefield,” *Military Medicine* 179, no. 5 (2014), 477; Kotwal et al., “Eliminating Preventable Death on the Battlefield.”

⁸“Changes by Robert Gates Kept U.S. Troops Alive in Afghanistan,” *Columbus Dispatch*, October 3, 2015, available at <<https://www.dispatch.com/story/news/military/2015/10/03/changes-by-robert-gates-kept/23778371007/>>; Robert M. Gates, Memorandum for the Commander, U.S. Central Command, “Afghanistan MEDEVAC Assessment,” DOD, June 15, 2009.

⁹Russ S. Kotwal et al., “The Effect of a Golden Hour Policy on the Morbidity and Mortality of Combat Casualties,” *JAMA Surgery* 151, no. 1 (2016), 15–24.

¹⁰Frederick B. Rogers and Katelyn Rittenhouse, “The Golden Hour in Trauma: Dogma or Medical Folklore?” *The Journal of Lancaster General Hospital* 9, no. 1 (Spring 2014), 12, available at <http://jlggh.org/JLGH/media/Journal-LGH-Media-Library/Past%20Issues/Volume%209%20-%20Issue%201/Rogers9_1.pdf>.

¹¹During the 2013 Military Health System Research Symposium in Fort Lauderdale, Florida, Commodore Alasdair Walker, the United Kingdom’s Military Health Services’ Medical Director, described a concept called the “Walker Dip.” Dr. Walker discussed the inadequate medical care available to British forces during the Crimean War. He traced recurrent historical cycles whereby medical care improves during conflicts, but the lessons are forgotten and relearned during the next war. See Robert L. Mabry, “Challenges to Improving Combat Casualty Survival on the Battlefield,” *Joint Force Quarterly* 76 (1st Quarter 2015), 83.

¹²Personal discussion with Dr. Robert Mabry, Principal Deputy Assistant Secretary of Defense for Health Affairs, July 2, 2020.

¹³Personal discussion with Dr. Jeremy W. Cannon, MD, S.M., FACS, Division of Traumatology, Surgical Critical Care & Emergency Surgery, Perelman School of Medicine at the University of Pennsylvania, November 16, 2020.

¹⁴Eastridge et al., “Death on the Battlefield,” S435.

¹⁵Frank K. Butler and John B. Holcomb, “The Military Learned to Stop the Bleeding: Many Civilian Lives Could Be Saved by Using Tourniquets,” *Wall Street Journal*, December 20, 2020, available at <<https://www.wsj.com/articles/the-military-learned-to-stop-the-bleeding-11608499774>>.

¹⁶John B. Holcomb et al., “Understanding Combat Casualty Care Statistics,” *The Journal of Trauma: Injury, Infection, and Critical Care* 60, no. 2 (February 2006), 398.

¹⁷Jeffrey T. Howard et al., “Use of Combat Casualty Care Data to Assess the U.S. Military Trauma System During the Afghanistan and Iraq Conflicts, 2001–2017,” *JAMA Surgery* 154, no. 7 (2019), 600, 606.

¹⁸“Joint Trauma System,” Department of Defense Center of Excellence for Trauma, available at <<https://jts.amedd.army.mil>>.

¹⁹Personal discussion with Lieutenant Commander Ronald D. Hardin and Major Jigar Patel, U.S. Army surgeons, September 21, 2021.

²⁰Alfred S. Gervin and Ronald P. Fischer, “The Importance of Prompt Transport in Salvage of Patients with Penetrating Heart Wounds,” *The Journal of Trauma: Injury, Infection, and Critical Care* 22, no. 6 (June 1982), 443, 446.

²¹Personal discussion with Colonel Kyle N. Remick, MD, FACS, Special Assistant to Combat Support Agency Director, National Capital Region Market Trauma and Emergency Medical System, Professor and Associate Chair for Operations, Uniformed Services University, Walter Reed Department of Surgery, December 14, 2020.

²²Kyle N. Remick et al., “Defining the Optimal Time to the Operating Room May Salvage Early Trauma Deaths,” *The Journal of Trauma and Acute Care Surgery* 76, no. 5 (2014), 1256.

²³Ibid.

²⁴Russ S. Kotwal et al., “The Effect of Prehospital Transport Time, Injury Severity, and Blood Transfusion on the Survival of U.S. Military Casualties in Iraq,” *The Journal of Trauma and Acute Care Surgery* 85, suppl. 1 (2018), S117.

²⁵*Scoop and run* is a prehospital medical concept based on transportation with little or no medical intervention. This is opposite to the prehospital concept of *stay and play*. “Researchers have discovered what gang members have known all along—that you’re more likely to survive a serious injury if you get yourself to hospital than if you wait for an ambulance.” See Zosia Kmiotowicz, “In Cases of Serious Injury ‘Scoop and Run’ Improves Survival Compared with Ambulance,” *BMJ*, September 22, 2017.

²⁶Michael W. Wandling et al., “Association of Prehospital Mode of Transport with Mortality in Penetrating Trauma,” *JAMA Surgery* 153, no. 2 (2018), 107, 108.

²⁷Kotwal et al., “The Effect of Prehospital Transport Time, Injury Severity, and Blood Transfusion on the Survival of U.S. Military Casualties in Iraq,” S112.

²⁸Howard et al., “Use of Combat Casualty Care Data to Assess the U.S. Military Trauma System During the Afghanistan and Iraq Conflicts, 2001–2017,” 600.

²⁹Donald Berwick, Autumn Downey, and Elizabeth Cornett, eds., *A National Trauma Care System: Integrating Military and Civilian Trauma Systems to Achieve Zero Preventable Deaths after Injury* (Washington, DC: National Academies Press, 2016), 89.

³⁰A *noncompressible hemorrhage* is a hemorrhage that arises from within the torso. Traditionally, gaining access and purchase to these sites requires surgical intervention. For this article, the term *noncompressible truncal hemorrhage* was intentionally avoided to maintain simplicity and have a broader scope.

³¹Eastridge et al., “Death on the Battlefield,” S434.

³²S.E. van Oostendorp, E.C.T.H. Tan, and L.M.G. Geeraets, Jr., “Prehospital Control of Life-Threatening Truncal and Junctional Haemorrhage Is the Ultimate Challenge in Optimizing Trauma Care; A Review of Treatment Options and Their Applicability in the Civilian Trauma Setting,” *Scandinavian Journal of Trauma, Resuscitation, and Emergency Medicine* 24, no. 110 (2016), 2.

³³J.S. Maughon, “An Inquiry into the Nature of Wounds Resulting in Killed in Action in Vietnam,” *Military Medicine* 135, no. 1 (1970), 8–13; Eastridge et al., “Death on the Battlefield,” S434; Shawn C. Nessen et al., “Unrealized Potential of the U.S. Military Battlefield Trauma System: DOW Rate Is Higher in Iraq and Afghanistan Than in Vietnam, but CFR and KIA Rate Are Lower,” *The Journal of Trauma and Acute Care Surgery* 85, suppl. 2 (2018), S7.

³⁴David R. Welling et al., “A Brief History of the Tourniquet,” *Journal of Vascular Surgery* 55, no. 1 (2012), 286.

³⁵Frank K. Butler, Jr., “Military History of Increasing Survival: The U.S. Military Experience with Tourniquets and Hemostatic Dressings in the Afghanistan and Iraq Conflicts,” *Journal of Special Operations Medicine* 15, no. 4 (Winter 2015).

³⁶Ibid.; John F. Kragh et al., “Historical Review of Emergency Tourniquet Use to Stop Bleeding,” *American Journal of Surgery* 203, no. 2 (2012), 9; Robert L. Mabry et al., “United States Army Rangers in Somalia: An Analysis of Combat Casualties on an Urban Battlefield,” *The Journal of Trauma: Injury, Infection, and Critical Care* 49, no. 3 (September 2000), 526.

³⁷Lorne H. Blackburne et al., “Decreasing Killed in Action and Died of Wounds Rates in

Combat Wounded,” *The Journal of Trauma: Injury, Infection, and Critical Care* 69, no. 1 (July 2010), S1.

³⁸ Eastridge et al., “Death on the Battlefield,” S433.

³⁹ *Ibid.*, S434.

⁴⁰ Adam Stannard et al., “The Epidemiology of Non-Compressible Torso Hemorrhage in the Wars in Iraq and Afghanistan,” *The Journal of Acute Care and Surgery* 74, no. 3 (2013), 831–833.

⁴¹ David R. King, “Initial Care of the Severely Injured Patient,” *New England Journal of Medicine* 380, no. 8 (February 21, 2019), 763; Oostendorp, Tan, and Geeraedts, “Prehospital Control of Life-Threatening Truncal and Junctional Haemorrhage,” 2.

⁴² Mehreen Kisat et al., “Epidemiology and Outcomes of Non-Compressible Torso Hemorrhage,” *Journal of Surgical Research* 184, no. 1 (2013), 418.

⁴³ *TCCC Guidelines* (Washington, DC: Deployed Medicine, Joint Trauma System [JTS], December 15, 2021).

⁴⁴ Whole blood (WB) collected in the anticoagulants CPD (citrate-phosphate-dextrose) or CPDA-1 (CPD-adenine) is a Food and Drug Administration–approved product when appropriately collected, stored, and tested for transfusion-transmitted disease by a licensed blood donor center. See JTS Clinical Practice Guideline (CPG) ID 21, *Whole Blood Transfusion* (Washington, DC: JTS, May 15, 2018).

⁴⁵ *Damage control resuscitation* (DCR) is a complementary strategy to damage control surgery; the goal of DCR is to stabilize a casualty enough for surgery. DCR prioritizes nonsurgical interventions to reduce morbidity and mortality from trauma and hemorrhage. The major principles of DCR are to restore homeostasis, prevent or mitigate the development of tissue hypoxia, oxygen debt, the burden of shock, and coagulopathy. *Damage control surgery* focuses on surgical interventions that address life-threatening injuries and delay all other surgical care until metabolic and physiologic derangements have been treated. See JTS CPG ID 18, *Introduction to Damage Control Resuscitation* (Washington, DC: JTS, July 2019).

⁴⁶ Eve Meinhardt, “‘Walking Blood Banks’ Fill Gap for Medical Care in Field Environment,” *Army.mil*, October 8, 2019, available at <https://www.army.mil/article/224502/walking_blood_banks_fill_gap_for_medical_care_in_field_environment>.

⁴⁷ Jennine L. Callum and Peter H. Pinkerton, “Evacuation, Resuscitation, and Transfusion Near ‘The Front,’ First World War, 1918,” *Transfusion* 58 (November 2018), 2476–2477.

⁴⁸ Spurgeon H. Neel, *Medical Support of the U.S. Army in Vietnam 1965–1970* (Washington, DC: Headquarters Department of the Army, 1991), 116–123.

⁴⁹ Stacy A. Shackelford et al., “Association of Prehospital Blood Product Transfusion During Medical Evacuation of Combat Casualties in

Afghanistan with Acute and 30-Day Survival,” *JAMA* 318, no. 16 (2017), 1581, 1586, 1590.

⁵⁰ Howard, “Use of Combat Casualty Care Data to Assess the U.S. Military Trauma System,” 606.

⁵¹ Phillip C. Spinella et al., “Warm Fresh Whole Blood Is Independently Associated with Improved Survival for Patients with Combat-Related Traumatic Injuries,” *Journal of Trauma* 66, no. 4 (2009), S69, S71, S75; JTS CPG ID 21, *Whole Blood Transfusion*; John B. Holcomb and Donald H. Jenkins, “Get Ready: Whole Blood Is Back Again, and It Is Good for Patients,” *Transfusion* 58, no. 8 (August 2018), 1821–1823; Shawn C. Nessen et al., “Fresh Whole Blood Use by Forward Surgical Teams in Afghanistan Is Associated with Improved Survival Compared to Component Therapy Without Platelets,” *Transfusion* 53, suppl. 1 (2013), 109S; Alan D. Murdock et al., “Whole Blood: The Future of Traumatic Hemorrhagic Shock Resuscitation,” *Shock* 41, suppl. 1 (2014), 67–68; Geir Strandenes et al., “Low Titer Group O Whole Blood in Emergency Situations,” *Shock* 41, suppl. 1 (2014), 74.

⁵² *Low titer O whole blood* (LTOWB) is whole blood from group O donors that has anti-A and anti-B antibody titers, is measured to ensure a low titer of antibody (for example, <1:256 saline dilution, immediate spin method), is designated LTOWB, and is used as “universal WB.” JTS CPG ID 21, *Whole Blood Transfusion*.

⁵³ Andrew D. Fisher et al., “Low Titer Group O Whole Blood Resuscitation: Military Experience from the Point of Injury,” *The Journal of Trauma and Acute Care Surgery* 89, no. 4 (2020), 838.

⁵⁴ Field Manual (FM) 3-04, *Army Aviation* (Washington, DC: Headquarters Department of the Army, April 2020), 1-5, 3-36; Army Techniques Publication 4-02.2, *Medical Evacuation* (Washington, DC: Headquarters Department of the Army, July 2019), 1-1, 2-3, 2-13, 2-16; Matthew Fandre, “Medical Changes Needed for Large-Scale Combat Operations: Observations from Mission Command Training Program Warfighter Exercises,” *Military Review*, May–June 2020, 41; Joint Publication (JP) 4-02, *Joint Health Services* (Washington, DC: The Joint Staff, December 11, 2017, Incorporating Change 1, September 28, 2018), VI-12, F-11; FM 4-02.1, *Army Medical Logistics* (Washington, DC: Headquarters Department of the Army, October 2015), 3-15, 7-1, 7-5.

⁵⁵ Brent Thomas et al., *Toward Resiliency in the Joint Blood Supply Chain* (Santa Monica, CA: RAND, 2018), iii, 16, 47.

⁵⁶ JP 3-0, *Joint Operations* (Washington, DC: The Joint Staff, January 17, 2017, Incorporating Change 1, October 22, 2018), I-3–1-4; JP 3-18, *Joint Forcible Entry Operations* (Washington, DC: The Joint Staff, May 11, 2017, Incorporating Change 1, January 9, 2018, val. June 27, 2018), IV-13, B-5; JP 3-31, *Joint Land Operations* (Washington, DC: The Joint Staff, October 3, 2019), I-3, 1-4, V-1.

⁵⁷ Kotwal et al., “The Effect of Prehospital Transport Time, Injury Severity, and Blood Transfusion on Survival of U.S. Military Casualties in Iraq,” S117.

⁵⁸ Russ S. Kotwal et al., “Leadership and a Casualty Response System for Eliminating Preventable Death,” *The Journal of Trauma and Acute Care Surgery* 82, no. 6, suppl. 1 (2017), S11.

⁵⁹ *Ibid.*, S11–S12.

⁶⁰ Andrew D. Fisher et al., “Tactical Damage Control Resuscitation,” *Military Medicine* 180, no. 8 (2015), 873.

⁶¹ JP 4-02, II-4; FM 4-02, *Army Health System* (Washington, DC: Headquarters Department of the Army, November 2020), 1-10–1-13.

⁶² A *speedball* is a package that delivers emergency or on-demand resupply in military operations. Speedballs can be prepackaged or made on demand and delivered via various methods.

⁶³ Eastridge et al., “Death on the Battlefield,” S432.

⁶⁴ As of August 1, 2019, there are three junctional tourniquets and devices recommended by the Committee on Tactical Combat Casualty Care, available at <<https://learning-media.allogy.com/api/v1/pdf/67fb9587-eb0a-4ea0-ba3d-a0840e2a71a8/contents>>.

⁶⁵ As of May 31, 2021, there are two REBOA (resuscitative endovascular balloon occlusion of the aorta) devices: the ER-REBOA and the COBRA-OS.

⁶⁶ *Bleeding control bundle* is an evidence-based set of actions, protocols, and/or equipment that is specifically targeted at arresting hemorrhage.

⁶⁷ Blessing T. Oyeniyi et al., “Trends in 1029 Trauma Deaths at a Level 1 Trauma Center: Impact of a Bleeding Control Bundle of Care,” *Injury* 48, no. 1 (2017), 1, 4.

⁶⁸ Courtney E. Morgan et al., “Tissue-Factor Targeted Peptide Amphiphile Nanofibers as an Injectable Therapy to Control Hemorrhage,” *ACS Nano* 10, no. 1 (2016), 899–909.

⁶⁹ Personal meeting with U.S. Army Forces Command Surgeon, XVIII Airborne Corps Surgeon, and XVIII Airborne Corps Deputy Surgeon for Clinical Operations, December 16, 2019.

⁷⁰ *CRISPR* is a tool for editing genomes, and it allows researchers to modify DNA sequences and alter gene function.

⁷¹ Adopted from the “JTS Mission Statement,” DOD Center of Excellence for Trauma, available at <<https://jts.amedd.army.mil>>.

⁷² King, “Initial Care of the Severely Injured Patient,” 768.

⁷³ Berwick, Downey, and Cornett, eds., *A National Trauma Care System*.



Antitank missileman with Weapons Company, Battalion Landing Team 1/4, 15th Marine Expeditionary Unit, observes surroundings from security post in support of Operation *Octave Quartz*, Baledogle Military Airfield, Somalia, January 8, 2021 (U.S. Marine Corps/ Brendan Mullin)

Information Suppressing Fire Repositioning Forces in Somalia

By Dagvin R.M. Anderson, Philip Buswell, and Andrew Caulk

For most Americans, the film *Black Hawk Down* is the first thing that comes to mind when they think about Somalia. Images of destroyed helicopters and dead U.S. Servicemembers being dragged through the streets of Mogadishu are now part of our

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national memory. Almost three decades later, the Battle of Mogadishu remains one of the most memorable information operations (IO) defeats of the modern U.S. military. Today, America works with the federal government of Somalia to promote stability and to prevent al-Shabaab, an al Qaeda affiliate, from conducting attacks against American interests and the homeland. When Special Operations Command Africa (SOCAFRICA) received orders in mid-November 2020 to move all forces out of Somalia by January 15, 2021, the risk

of another *Black Hawk Down* incident was at the forefront of senior leader considerations. Therefore, the main objective of what became Operation *Octave Quartz* (OOQ) was to safely reposition all U.S. forces in Somalia. Deterrence was critical to mission success.

The Threat and Strategic Problem

The threat of a strategic IO loss and the need to deter al-Shabaab from attacking U.S. forces led SOCAFRICA, and soon Joint Task Force–Quartz

(JTF-Quartz), to shift the traditional U.S. military planning paradigm. Rather than apply IO at the final stages of planning in a supporting role—and consigning IO to an obscure base order annex—JTF-Quartz started planning with information operations as a main line of effort of OOQ. Over the next 2 months, JTF-Quartz demonstrated that information operations are simply *operations* and that IO requires the same level of effort and integration as a traditional mission, including focused intelligence collection, deliberate targeting development, execution, and assessment. At times, joint force maneuver elements served in support of messaging and information objectives to achieve the desired operational effect. This reversal of information and maneuver was present throughout OOQ. Even when supporting maneuver operations, IO was thoroughly integrated into the initial planning to maximize operational effects. The deliberate integration of information-related capabilities (IRCs) throughout operations defined JTF-Quartz.¹

Intelligence reporting and mission analysis highlighted that al-Shabaab was active in the information domain, intended to inflict casualties on U.S. forces, and wanted to create a political situation leading to full U.S. withdrawal. Due to public communication of the repositioning, al-Shabaab knew that the U.S. military was moving forces out of Somalia and it was seeking to achieve another strategic IO victory—one that could cause a more enduring U.S. withdrawal. As a result, the JTF-Quartz commander identified the contest in the information domain as key terrain and ordered a deliberate and integrated IO line of effort in his initial planning guidance.²

JTF Key Task and Organization

The task of planning and integrating information and operations fell to the recently formed Information Warfare Center–Africa (IWC-Africa). Nearly a year prior, SOCAFRICA identified IO as an underinvested competition field in Africa. Fully integrating and employing IO to support tactical commanders and

achieve timely effects in the environment required more than what a traditional J39 staff element could provide. IWC-Africa was created under the J3 in the summer of 2020 with a graduated Special Forces battalion commander leading it, thereby bringing information and kinetic operations together on an equal footing. IWC-Africa reallocated J39 staff and rotational forces, including psychological operations and civil affairs personnel, in a zero-growth environment to create an organization with a traditional structure normally found in operational units.

Specifically, IWC-Africa divisions included future operations, current operations, and assessments (in lieu of intelligence). A key driver of operational success came from the creation of action elements, called cross-functional teams (CFTs), that focus on integrating SOCAFRICA’s operations, intelligence, and IRCs with subordinate component planners. These CFTs represented all IRCs in the SOCAFRICA future operations (J35) planning cells. This physical presence of IWC-Africa personnel in the operations and planning spaces helped not only raise awareness of the wide array of IRCs available to the planning staff but also fully integrate them into operational planning and execution. New coordination lines and relationships emerged among the CFTs, as well as the intelligence directorate (J2), force providers, components, and higher headquarters. This integrated structure allowed IWC-Africa to quickly transform into JTF-Quartz IWC and integrate information operations into the initial stages of mission planning.

Joint Force Structure and Operational Planning Processes

JTF-Quartz was built around special operations forces already operating in the Horn of Africa, but this force received significant augmentation early in the mission in the form of an amphibious readiness group/Marine expeditionary unit, a carrier strike group, and significant expeditionary air and ground combat assets. An early challenge of JTF-Quartz IWC was iden-

tifying and properly applying diverse capabilities from across the joint force. Establishing liaisons and assimilating joint capabilities into planning and allocation processes were critical to mission success. JTF-Quartz established a joint force maritime component command (JFMCC) to control the maritime assets whose fires and effects cell immediately integrated into the JTF-Quartz IWC, communicating the capabilities and potential employment of the numerous IRCs contained within the maritime component. This fires and effects cell deployed to Djibouti as a liaison element to JTF-Quartz and embedded with the Joint Special Operations Task Force–Somalia J39. More than a liaison node, the fires and effects cell served as an extension of the IWC and aggressively and effectively integrated all JFMCC IRCs into operations.

The theme of integration continued with the air component and demonstrated how IO integration was not limited to the purview of IRCs or IO specialists; all military activities have IO potential. The joint air component coordination element (JACCE) understood this idea well. The joint asset allocation meetings (JAAM), led by the JACCE, became the focal point for IO integration and information target nomination. By understanding the commander’s intent, the JACCE treated the IWC as a *de facto* operational asset. The JACCE also actively sought out IO possibilities in all military activities that the various components were planning, such as aircraft overflights and AC-130 gunship weapons alignment.³ The JAAM process allowed the seamless integration of kinetic and nonkinetic operations and made the information line of effort a daily conversation topic with operations officers across the JTF.

In addition to the JAAM, the IWC established battle rhythm events to synchronize exquisite or niche capabilities that are often compartmentalized or held at higher classification levels. One such battle rhythm event involved integrating the joint electromagnetic spectrum operations cell (JEMSOC), which conducted split operations between the IWC JEMSOC director and

Air Force F-16 Fighting Falcon based in U.S. Central Command area of operations conducts armed aerial patrols in Somalia in support of Operation *Octave Quartz*, January 9, 2021 (U.S. Air Force/Trevor T. McBride)





an acting director forward. This cell supported all other operations by layering effects from across the joint force and ensured compartmented activities were properly synchronized. Applying the lessons learned from integration within SOCAFRICA, the IWC sought out ways to build commanders' awareness of activities and capabilities that are sometimes relegated to the proverbial vault. One effective method to ensure broad but targeted awareness was the inclusion of a hyperlink in the nightly situation reports that allowed commanders and operations officers with proper clearances to see daily reports of compartmented activities. Ensuring commanders were informed of compartmented activities not only increased integration but also allowed the components to identify opportunities for new compartmented activities.

Integration and alignment of IRCs continued above the JTF and theater special operations command as well. Both U.S. Africa Command (USAFRICOM) and U.S. Special Operations Command and their associated strategic capabilities were allocated to the mission and were woven into JTF operations. Regional and strategic messaging conduits from both combatant commands were allocated as direct support to the JTF. This allowed the JTF military information support operations (MISO) officer to orchestrate a complete set of messaging options ranging from local word of mouth to strategic digital platforms. This large repertoire of messaging options allowed the JTF to be dynamic in the information environment and enabled a significant degree of control there.

Additional strategic support came from the USAFRICOM commander and public affairs office. Traditionally, public release authority is fragmented among various command levels and Service components. Early in the operation, the USAFRICOM commander specified and focused public release authority in the JTF. This delegation significantly decreased the time required to make a public release after a significant military event and unified the information joint function under the responsible commander. While the JTF was the

supported command for information, USAFRICOM and other commands continued to provide overt communication support to the mission, just as they would for physical or kinetic effects. By clarifying and unifying information authorities and through deliberate preparation, JTF-Quartz was able to beat al-Shabaab to the punch after every strike and to get facts out into the information environment before al-Shabaab could create compelling false narratives.

Expanding the IO Team

The focus on integrating IO was not limited to external assets. The demands of the operation raised the integration of the SOCAFRICA contributions to the JTF staff to an unprecedented degree. Effective and timely IO required close coordination between physical and informational capabilities across all attribution levels, including the IWC, public affairs, operations, intelligence, and other special activities. Through daily staff and battle rhythm events, planners from all disciplines clearly understood the activities and intent of the others.

JTF-Quartz competed in the information environment through traditional MISO activities, compartmented programs, and public messaging. SOCAFRICA (and JTF-Quartz) public affairs and IWC staff had already developed a close relationship during the formation of the IWC throughout the previous year. Both came together immediately during JTF formation and closely collaborated on all strikes and tactical operations. Historically, this close partnership has been frowned on due to fears about public affairs losing credibility by being associated with IO. OOQ information outcomes demonstrate the importance of synchronizing these capabilities across attribution levels in a complementary fashion through the IWC that preserves the credibility and effectiveness of public affairs while remaining well within ethical and regulatory guidelines. As a result, public affairs planned and published timely and accurate messages and imagery to accompany carefully selected JTF operations. These overt information engagements often served

as information anchors that allowed for other IRCs to amplify U.S. capabilities or exploit adversary weaknesses. Some examples of overt releases included topics such as introducing new combat capabilities into theater (for example, ship and aircraft factsheets), publishing imagery of JTF forces in the regions (aerial imagery of ships off Mogadishu's coast), and releasing imagery and messaging about air strikes against al-Shabaab targets.⁴

Creating and Measuring Effects

The best and clearest example of coordination between physical acts and information operations was the pairing of kinetic strikes with closely sequenced information releases. Throughout the mission, kinetic strikes helped reduce al-Shabaab's offensive capability and morale, but these strikes did not achieve success alone; all strikes were integrated with a robust messaging effort. The prime directive for this operation was deterring al-Shabaab from attacking U.S. troops through all kinetic and *nonkinetic* means available. Additionally, countering al-Shabaab disinformation was a critical secondary element to JTF-Quartz efforts. Publishing accurate overt information about strikes supported by other IRCs before al-Shabaab could create a compelling false narrative enabled JTF-Quartz to maintain informational advantage—both over al-Shabaab and by reassuring the Somali people. JTF-Quartz operationalized IRCs throughout OOQ by creating and refining detailed battle drills that identified the myriad steps necessary to plan imagery collection, coordinate messaging with numerous actors, confirm strike battle damage, and gain commander approval to release the air strike information package. Because of this well-synchronized process, JTF-Quartz kept al-Shabaab on the defensive in the information environment to the point that it was never able to produce a meaningful counternarrative throughout the operation despite its stated intent and previous success in this domain.

Beyond supporting maneuver and strike operations, information operations frequently became the supported



Air Force KC-10 Extender inflight refueling specialist, assigned to 908th Expeditionary Aircraft Refueling Squadron, reacts to communication among aircrew during air refueling mission over Africa in support of Operation *Octave Quartz*, January 9, 2021 (U.S. Air Force/Trevor T. McBride)

element in OOQ, where maneuver operations were conducted to support an IO objective. Early in the operation, the warships supporting JTF-Quartz executed choreographed displays along the coasts of population centers. These displays were part of a larger information operation designed to inform and deter the adversary. Near the end of the repositioning effort, the JTF synchronized an increase in military activity to confuse the adversary and reinforce other information operations. Partner patrols in conjunction with rotary-wing displays and nighttime illumination operations paired with selectively disseminated information led the enemy to believe the JTF was conducting deliberate operations when it was not and

convinced the adversary that it was not safe to operate in the area. So compelling were these operations that in certain cases the adversary demonstrated belief perseverance when it continued to believe JTF narratives despite new information that firmly contradicted it. Last, these operations allowed the JTF to employ highly sensitive equipment to build out situational awareness, develop targets, and create options for the commander.

To assess the impact of the information operations, analysts and intelligence specialists understood the purpose of IO activities and, as a result, were more attuned to reflections in the environment. Beyond the traditional intelligence role of identifying enemy activities through

various sources, analysts also monitored the narrative trends. This information was critical in providing timely assessments that helped both validate and inform future information activity. One way to consider how the JTF employed IO is through the traditional targeting cycle.⁵ After nominating an information engagement target, “weaponizing” a solution, and executing the operation, intelligence collected by the J2 then fed back into the targeting cycle to allow for course corrections or new targeting opportunities. A key lesson learned from this is that fully resourced intelligence, which integrates both open-source and classified intelligence, is critical to effective IO.



Antitank missileman with Weapons Company, Battalion Landing Team 1/4, 15th Marine Expeditionary Unit, prepares Javelin antitank missile for training as part of Operation *Octave Quartz*, Baledogle Military Airfield, Somalia, January 10, 2021 (U.S. Marine Corps/Brendan Mullin)

The Evolving Deterrence Campaign

The information operations line of effort was labeled by the JTF as the “deterrence campaign” and became one of the pillars of the nightly commander’s update briefs. The deterrence campaign laid out significant IO activities, both planned and unplanned, and the assessed desired effect within the information environment.⁶ The initial deterrence campaign was based around the window of perceived vulnerability of U.S. forces but evolved over time. Almost nightly, the JTF commander provided updated guidance and intent based on the assessments, emerging trends, and developments in the operating area. The commander sought to temper and pace the deterrence campaign to avoid oversaturation by choosing when to dominate the

information environment and when to use a light touch to allow previous messaging to propagate. He also placed an emphasis on guiding the adversary to its own conclusions versus trying to bluntly telegraph what we wanted the adversary to think. To accomplish this, JTF-Quartz implemented a layered approach in messaging and applied a variety of messaging conduits spanning from the local level to the Horn of Africa regional level.

The commander’s nightly updates served to flatten communication and ensured the entire JTF understood the deterrence campaign, which allowed it to quickly pivot to exploit new opportunities. As an example, the JTF learned that a previous deterrence act had fostered an incorrect belief by the adversary. While unintentional, the JTF determined that the faulty belief was beneficial to the

deterrence campaign and quickly adjusted operational activities to reinforce this false narrative. The JTF exploited the principle of confirmation bias; it is easier to tell someone about something that he or she already believes. Understanding the intent, the JTF components nominated new concepts and activities that were quickly executed to exploit this opportunity. This example and several other modifications highlight the need for a flexible information operation approach that adapts to the enemy and situation much like traditional maneuver operations.

Results

Improvisation was the spirit of the deterrence campaign. Much like a jazz band, the components and staff riffed on each other’s ideas—for example, reinforcing a false narrative—to create an effective operational harmony that

was founded in clear objectives and an established IWC framework. Each component identified new opportunities and found different ways to contribute throughout the course of the mission. One observation from this bottom-up process was the aptitude and ease the new generation of Servicemembers has for competition in the information environment. This next generation of warriors has an inherent understanding of information competition and should be empowered to develop new approaches for influence propagation. Throughout the mission, tactical elements demonstrated a talent for nominating creative and effective IO concepts. The mission also allowed for the components to validate newly employed concepts and capabilities, furthering future force designs. The IWC was in the fortunate position of synchronizing IO activities, not generating or enforcing IO activities. This was only made possible by command emphasis and flat communication. All components understood, and operationalized, both the intent and potential of information operations.

The result of these combined efforts was a successful deterrence campaign embedded within the overall success of OoQ. From the start, al-Shabaab was placed on the defensive in the information environment through both kinetic and nonkinetic operations and did not recover during the operation. The aggressive and adaptable IO line of effort that was treated as a principal element of the overall operation allowed the JTF to dominate the information environment and to achieve mission objectives. The most significant lesson learned by the JTF-Quartz IWC is a simple one: information operations are *operations* and should be treated equally with other strike and maneuver operations. IO require command emphasis, full integration across the staff, and a targeting cycle.

Key Lessons

Throughout the process of building IWC-Africa culminating in OoQ, SOCAFRICA learned some critical and hard-won lessons. First, cross-functional integration and organization are critical

to effectively operationalize the information. The IRCs—including overt public affairs, nonattributed psychological operations, and special activities—are too varied, nuanced, and specialized to simply tack on to traditional physical operations. The complex interplay of IRCs requires a dedicated planning staff to weave these effects into a mutually reinforcing campaign. The information environment spans tactical to strategic levels of warfare. The combatant command's delegation of authorities and resources were critical in enabling the JTF to properly align and synchronize all IRCs in a timely manner.

Second, effective IO is not free. It requires an investment in time, personnel, and resources that SOCAFRICA had made a priority the preceding year. Without that fortuitous investment, the outcome of OoQ, and the future of U.S. operations in East Africa, could have turned out differently. Yet IO and IRCs are not prioritized for funding, personnel, and development as maneuver units are by military Service and operational budgets. This is a strategic deficit that we must invest in now to truly compete in the future.

Third, commanders and senior leaders must emphasize and prioritize information. U.S. military structure and training have focused on kinetic warfare for most of its history. Operationalizing information is a dramatic shift that takes significant command prioritization.

Fourth, while the JTF was able to achieve success in OoQ, the operation was limited in geography, timeline, and scope. Effective IO in the broader geopolitical information environment will require more than just cobbling together an IWC with zero growth. Instead, we will need to build processes, demolish interagency stovepipes, and craft an entirely new U.S. Government machine. The Department of Defense has a role to play in this effort, but much of the challenge lies in other agencies and branches of government.

Finally, SOCAFRICA learned about the dynamic nature of IO and the information environment itself. The enemy, and the public, always get a vote. This time, JTF-Quartz was able to stay ahead

of its adversary. In most other cases, we will have to constantly adapt with the understanding that we may never reach information dominance.

It is SOCAFRICA's hope that our experiences and lessons learned pave the way for future U.S. success in the information environment. JFQ

It is imperative to this article to recognize the contributions of U.S. Africa Command and staff that enabled Joint Task Force-Quartz successes. The employment of layered effects from multiple information-related capabilities reflected how information operations safely enabled the reposition of U.S. forces in Somalia while concurrently integrating intelligence, deliberate development, targeting, and execution into the overall operations cycle. Procedimus Una (We Go Together).

Notes

¹ *Strategy for Operations in the Information Environment* (Washington, DC: Department of Defense, June 2016), available at <<https://dod.defense.gov/Portals/1/Documents/pubs/DoD-Strategy-for-Operations-in-the-IE-Signed-20160613.pdf>>.

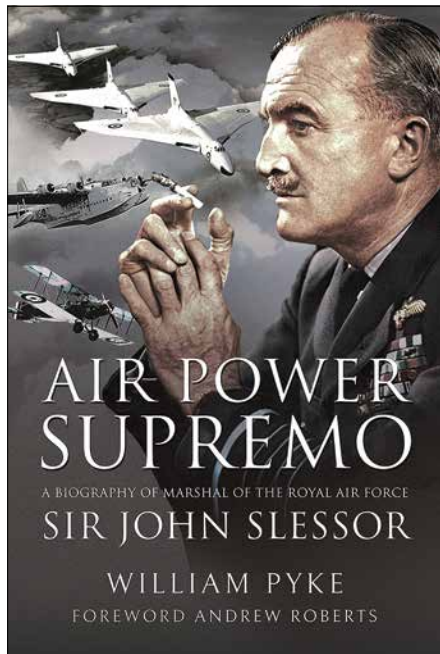
² See "Joint Task Force-Quartz," Defense Visual Information Distribution Service, n.d., available at <<https://www.dvidshub.net/feature/jtfquartz>>.

³ *Joint Concept for Operating in the Information Environment (JCOIE)* (Washington, DC: The Joint Staff, July 25, 2018), viii–ix, available at <https://www.jcs.mil/Portals/36/Documents/Doctrine/concepts/joint_concepts_jcoie.pdf>.

⁴ "Joint Task Force-Quartz."

⁵ Joint Publication (JP) 3-09, *Joint Fire Support* (Washington, DC: The Joint Staff, April 10, 2019), IV-4, available at <https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/jp3_09.pdf?ver=2019-05-14-081632-887>.

⁶ JP 3-13, *Information Operations* (Washington, DC: The Joint Staff, November 27, 2012), II-1, available at <https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/jp3_13.pdf>.



Air Power Supremo: A Biography of Marshal of the Royal Air Force Sir John Slessor

By William Pyke

Pen and Sword Military, 2022

253 pp. \$49.95

ISBN: 978-1399095525

Reviewed by Benjamin S. Lambeth

In the pantheon of air power pioneers from the dawn of military aviation to the advent of the jet age nearly four decades later, Marshal of the Royal Air Force (RAF) Sir John Slessor never gained the stature and name recognition of such earlier air warfare icons as General Billy Mitchell of the U.S. Army Air Service. Yet viewed in hindsight, Slessor was uncommonly instrumental in the development of effective air doctrine, concepts of operations, and organizing principles during his 37 years as an airman, combat commander, and senior leader.

In *Air Power Supremo: A Biography of Marshal of the Royal Air Force Sir John Slessor*, a rich and aptly titled survey of Slessor's life and career, William Pyke has produced by far the most searching and authoritative assessment of the man and his contributions to have appeared in print. Others have written before on

Slessor's import in air warfare, most notably the air power historian Phillip Meilinger, who portrayed Slessor in his prime as perhaps "the most prescient thinker in the RAF" about the most likely nature of future war. Yet thanks to Pyke's close association with Slessor's living grandson and his resultant unfettered access to the entirety of Slessor's personal papers and logbooks, this new appraisal offers a truly magisterial overview of Slessor's insights and influence, depicting him persuasively as "one of the greatest air power thinkers of the twentieth century." That informed characterization should render Slessor and his perspectives of abiding interest to joint warfighters today.

Born and raised in a predominantly military family, Slessor joined the Royal Flying Corps on his 18th birthday and had a storied career that ran from the birth of combat aviation, with the most rudimentary biplanes of World War I, to the fielding of the RAF's four-engine jet bombers not long after the start of the nuclear age. Slessor flew his first combat sorties against German zeppelins over southern England, followed by attacks on Turkish positions in the Sinai Peninsula and, finally, by missions over the Western Front toward the war's end. That hands-on operational exposure gave him the beginnings of a seasoned airman's outlook when he was later assigned as a faculty member at the British Army's staff college in Camberley in 1931.

In his lectures to the students at Camberley, Slessor offered wide-ranging thoughts on the most productive ways of using the RAF in joint operations with the Army. Yet as devoted as he was to advocating for the advantages afforded by air power if employed to its fullest potential, he was anything but a zealot. In marked contrast to the Italian air power theorist General Giulio Douhet's oft-quoted but baseless claim that it was not merely necessary but also sufficient to have control of the air for achieving victory, Slessor admonished his fellow airmen always to remember and honor the foundational fact that "no attitude could be more irritating" than to suggest that success in a future war might be "decided in the air, and in the air alone."

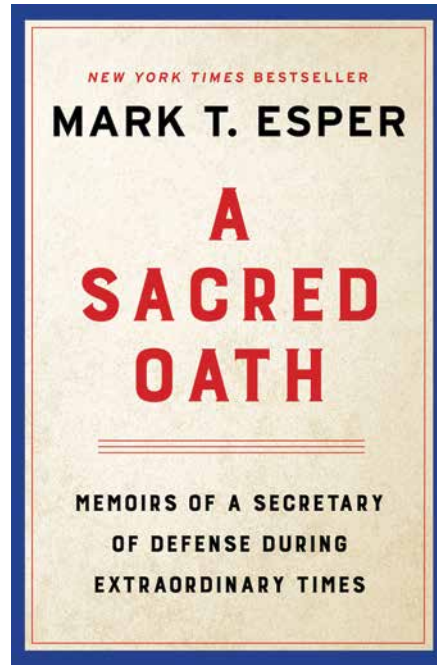
Among his many other contributions, Slessor left an enduring mark in the form of visualizing air warfare across the entire spectrum of conflict, ranging from providing tactical support to friendly ground troops in a land battle to conducting strikes against targets in an enemy's strategic heartland. In the process, he figured prominently in crystallizing the notions of air superiority and air supremacy. He also, quite early on in his writings, introduced a concept that would eventually be called *air interdiction*, with its main stress on disrupting an opponent's capacity for collective action, rather than simply inflicting damage on key enemy equities as the desired end in itself. Because of this construct, he was a founding father as well of what decades later would become known more precisely as *effects-based operations*.

Throughout Britain's involvement in World War II, as Pyke explains in detail, Slessor figured centrally as a senior planner in close cooperation with his American counterparts, displaying an uncommon touch for working harmoniously with Americans and thus attesting to the often pivotal role played by personality in shaping war outcomes. He was well appreciated by the American side for his affability and candor, and he became especially close friends with Generals Ira Eaker and Carl Spaatz, two of the leading commanders of the U.S. Army Air Forces (USAAF) participation in the air war. Through those intimate and trusting interactions, Slessor was vital in helping first to bring the United States into the war against Nazi Germany and then in nurturing the close Anglo-American partnership that ensued and persists to this day.

In all, *Air Power Supremo* offers a most welcome addition to the extant body of scholarship on military aviation and air warfare. Not only does it highlight Slessor's key role in determining the RAF's initial force structure needs on the eve of a war for Britain's national survival, it also describes the no less important part Slessor played during his 3-year tenure as chief of the Air Staff after World War II, when he successfully pressed for the acquisition of the RAF's Victor, Valiant, and Vulcan jet bombers as the centerpiece of

an independent British nuclear deterrent against the Soviet Union. For American readers, perhaps the most instructive portion of Pyke's book may be its treatment of Slessor's role in forging both close and enduring ties between the RAF and the USAAF—and its assessment of what that experience can teach us to this day about adapting to rapid technological change and building an institutional culture that rewards risk and innovation. In that important respect, the book offers insightful reading not just for airmen and others interested primarily in the evolution of air power, but for joint force combatants in all services across the board. JFQ

Dr. Benjamin S. Lambeth is a nonresident Senior Fellow with the Center for Strategic and Budgetary Assessments and is the author, most recently, of *Airpower in the War Against ISIS* (Naval Institute Press, 2021).



A Sacred Oath: Memoirs of a Secretary of Defense During Extraordinary Times

By Mark T. Esper
HarperCollins, 2022
752 pp. \$35.00
ISBN: 978-0063144316

Reviewed by Thomas F. Lynch III

A *Sacred Oath: Memoirs of a Secretary of Defense During Extraordinary Times* is the narrative of Mark Esper, former Secretary of Defense for the Trump administration, about his tumultuous 17 months in office, which ended with his November 2020 firing by Trump. *A Sacred Oath* confronts a vital first-order question for all uniformed and civilian military professionals: How do I faithfully adhere to my sworn oath to protect and defend the U.S. Constitution from all enemies, foreign and domestic? This question is especially searing when it comes to upholding the oath as a senior civilian political appointee in the face of a domestic security threat from the White House itself. There is no perfect answer, but contextual factors help inform whether a senior Department of Defense (DOD) official should offer

resignation rather than remain and enable the threat in hopes of moderating it.

A Sacred Oath is Esper's tale of why he chose to stay on as Trump's third of four DOD secretaries despite all the red flags warning that such a choice was bad for the country and bad for Esper personally. Esper's two-part answer is that he swore an oath to the Constitution, and if he had resigned in protest over any of the multitude of dangerous defense and security ideas coming out of the Trump White House, then the next acting Secretary could have been someone truly ready and willing to carry out Trump's impetuous impulses—and that would have been seriously detrimental to the country. The burden to make this narrative stick is high, and Esper struggles to meet it. On the one hand, Esper does not address fully the important related questions about his selection or his power basis as Secretary and, on the other, when compared with the more commonly understood interpretations of holistic selflessness in honoring a sworn oath to the Constitution, Esper seems to rely on a less-demanding standard.

Among the many important questions that *A Sacred Oath* does not fully address is the one about why Esper was Secretary in the first place. He was the Trump administration's Secretary of the Army for a brief 19 months from 2017 to 2019. A West Point graduate, former Active-duty Army infantry officer, and Army Reservist, Esper also had a short stint as a Deputy Assistant Secretary of Defense for Negotiations Policy, had years on Capitol Hill as a staffer, and then was a midlevel defense industry lobbyist. So Esper seemed a good fit as Army secretary, even though he was the administration's third choice. But what about Esper's qualifications to become Secretary?

Since the position's creation in the late 1940s, congressionally confirmed secretaries have generally held one of three major personal qualifications for their positional power: prior distinguished service in very senior executive or legislative-branch security leadership positions; experience in industry, with relevant defense ideas or acumen; or

personal friendship and a trusted working relationship with the President. These qualifications give secretaries voice and gravitas in shaping a DOD agenda or managing challenging security circumstances. Esper brought none of them to the job; his past positions paled in comparison with historical Secretary power bases.

Thus, Esper's telling of his June 2019 move to become Secretary is unhelpfully spartan. He lets us know that Trump disliked retired U.S. Marine Corps General Jim Mattis as the first administration Secretary, but without clearly stating that Mattis resigned in December 2018 over glaring concerns about Trump's threat to national security—from the appalling treatment of U.S. security partners to reckless machinations on U.S. troop withdrawals from Syria, Iraq, Afghanistan, and the North Atlantic Treaty Organization. Also absent from Esper's telling are the names Milley and Urban. Then—Army Chief of Staff General Mark Milley had been on favorable terms with the White House since Trump announced him as the next Chairman of the Joint Chiefs of Staff back in December 2018. David Urban, Esper's 1986 West Point classmate and Pennsylvania chair of the Trump 2016 Presidential campaign, remained a famous Trump-whisperer on administration personnel matters and especially regarding his many West Point classmates in Trump's orbit. Were those two important factors in Esper's rather curious selection?

The missing details matter because Esper tells us that he had personally witnessed Trump meandering recklessly in and out of Army policy matters without regard for counsel by Secretary Mattis or National Security Advisor H.R. McMaster. Mattis and McMaster resigned in 2018 because of their oath to the Constitution, rather than remaining in a misguided attempt to honor it.

From the first chapter, Esper provides stark details about Presidential security directives ranging from the absurd to the dangerous. He recounts Trump asking to have the U.S. military shoot the legs of peaceful protesters in Washington, DC, demanding that DOD consider

firing Patriot missiles into Mexico to stem the flow of illegal refugees, agitating to activate and move National Guard units from Republican-governed states into Democratic-governed ones to “get tougher on Antifa,” and on and on. Esper establishes Trump as a clear threat to national security, seemingly to convince us that his oath meant he had to stay to ensure less terrible outcomes than might otherwise accrue. Is this true?

Here, context matters for proper analysis, and Esper provides the reader with a contextual gem in chapter 18, perhaps the most important insight of the book, in which Esper attempts to show that he pushed back to such an extent that Trump considered his dismissal: “My friends close to the White House said that while Trump was angry, he wasn't going to fire me. His own reelection still took priority over his desire for retribution.” Did Esper fully wield this knowledge to preserve and defend the Constitution? Did he leverage the insight to comprehensively prevent detrimental ideas and directives from jeopardizing the national interest? Not in his telling. Instead, Esper ruminates repetitively about the many days he wondered if he were going to be fired by the President. How is the reader to square this circle? How could Esper know of his fireproof political coating before November 2020, yet consistently fear firing, refrain from threatening resignation, and make no full-throated public pronouncement against Trump White House tweets and press statements that were dangerously overriding DOD professional counsel again and again?

The real answer seems tied to a limited interpretation of his oath to the Constitution. Esper's self-interest in remaining the Secretary and staying in the good graces of his political party go unaddressed. Undoubtedly, Esper did take helpful, if behind-the-scenes, stands against some of the most outlandish Trump national security ideas. In doing so, Esper took some personal risk, but never the full measure. More often, Esper recounts, he acquiesced to the absurd, rationalizing that his efforts inhibited far worse security outcomes. If the President and his 2019–2020 advisers were as out

of control as Esper represents, then he had a powerful option—and perhaps even a duty—to threaten resignation to arrest the madness, not merely to stick it out. Instead of using the threat of resignation to erect a concrete barrier in the face of the administration's fusillade of threats to U.S. national security during 2019 and 2020, Esper reveals that he was content to throw thumbtacks in the path of a careening, up-armored Presidential re-election bus with run-flat tires.

Esper comes to his readers in *A Sacred Oath* like Lady MacBeth, asking that we absolve him of the “damned spot” of enabling many, though not all, of the Trump administration's threats to national security. It is hard to grant him this request. Esper may have delayed or diverted some of the most dangerous White House national defense ideas and directives, but far too few to prove his constitutional fealty. The reader can feel some sorrow for the recurring humiliations Esper describes enduring as Secretary while still wondering whether it was personal ambition and party loyalty that negated Esper's more appropriate play of his resignation card. Many readers of *A Sacred Oath* will finish it justifiably unconvinced that former Secretary Esper faithfully fulfilled a truly sacred oath. JFQ

Dr. Thomas F. Lynch III is a Distinguished Research Fellow in the Center for Strategic Research, Institute for National Strategic Studies, at the National Defense University.

THE STRATEGY OF DENIAL

AMERICAN DEFENSE IN AN AGE
OF GREAT POWER CONFLICT

ELBRIDGE A. COLBY

The Strategy of Denial: American Defense in an Age of Great Power Conflict

By Elbridge A. Colby
Yale University Press, 2021
384 pp. \$32.50
ISBN: 978-0300256437

Reviewed by Travis Zahnow

In *The Strategy of Denial: American Defense in an Age of Great Power Conflict*, Elbridge Colby, a lead architect of the 2018 National Defense Strategy, wades into the ever-prescient debate about how the United States might compete with China in the Pacific. The Joseph Biden administration's recent release of the 2022 Indo-Pacific Strategy and the pending release of the 2022 National Defense Strategy add urgency to a question three Presidential administrations have sought to answer: "What is the best defense strategy for America?" Colby's work undertakes this vexing question, offering a novel strategy, as well as what many will consider to be polarizing and potentially unviable recommendations focused on a strategic realignment, in which the Biden administration would undertake not just to compete with

China but to deny China the ability to achieve regional hegemony in the Indo-Pacific.

The heart of the argument offered in *The Strategy of Denial* suggests that the United States should focus most of its effort on countering China in the Indo-Pacific, at the potential cost of reduced attention and resources elsewhere around the globe. Although Colby makes a logical case, some readers may find this argument, with its required tradeoffs, unpersuasive, noting that the United States has vital interests in other regions as well. Even in a resource-constrained environment in which the United States expects its allies to shoulder more of the burden, one needs only to watch the unfolding disaster that is Russia's invasion of Ukraine to recognize that a myopic focus on the Indo-Pacific will be problematic.

Some of the recommendations in *The Strategy of Denial* may remind readers of the Barack Obama-era pivot that was viewed by some as "decline management." There is a parallel, but Colby's strategic concept is more nuanced than previous ones. Focusing on the fact that U.S. ambiguity in the region is more harmful than helpful, Colby argues that specificity is important. The United States needs to communicate exactly how it plans to prevent China from becoming too powerful in the region, how it plans to guarantee partner security in the region, and whose security it is guaranteeing. U.S. partners deserve to know where they stand on the concept of island chain perimeter defense that many strategists call for.

Colby relies heavily on assumptions derived from Western literature that speculate about Chinese motivations toward becoming a regional hegemon in the near term and a global power in the long term. One would expect the inclusion of translated Chinese sources in a thoroughly researched volume. For that, readers should turn to Rush Doshi's *The Long Game*, which provides context for understanding China's aspirations. Also missing from Colby's work is a deep examination, or acknowledgment, of his assumptions about why China will ascend in the Pacific. This is problematic for two

reasons: it opens the book to criticism if the assumptions later prove incorrect, and it relies on the belief that the reader will agree with the author's assertions. Neither is guaranteed.

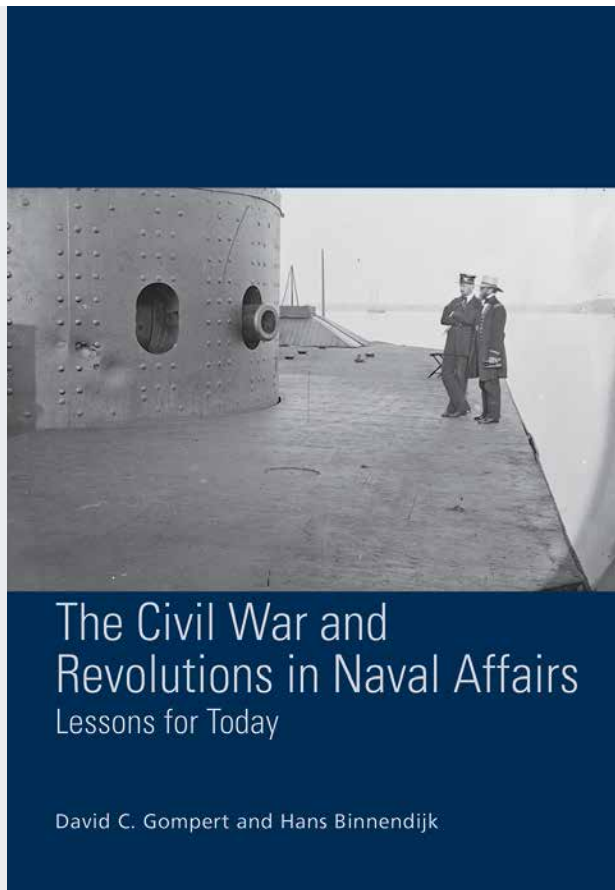
To Colby's credit, the last section of *The Strategy of Denial* might be worth the price of admission and will be most useful to strategists and policymakers alike. Chapter nine deals with ways to end the limited war Colby envisions between China and the United States. Here, Colby offers the reader plausible and believable policy recommendations about war termination should the United States and its allies not develop an effective policy to curb Chinese economic and military expansion within the region. Colby also tackles what escalation in such a scenario might look like, how a protracted war might take shape, and how the United States could compel an end to a conflict that readers may think Colby believes inevitable. In chapter 10, Colby also probes how his "denial defense" might not work out, exploring how and why such a strategy would fail when one takes into account that China has a vote in any potential U.S. strategic success.

Whereas Colby focuses mostly on the China challenge, readers would also benefit from Michael O'Hanlon's *The Art of War in an Age of Peace: U.S. Grand Strategy and Resolute Restraint*. O'Hanlon offers an alternate view—one that emphasizes that different regional challenges for the United States are globally intertwined. O'Hanlon's work ties together the familiar four-plus-one state-based threat construct (that is, Russia, China, North Korea, Iran, and transnational violent extremism) and then doubles it to include nuclear, biological, and digital threats; climate change; and weakened domestic cohesion. It also acknowledges how globally intertwined many challenges are. The way the United States deals with Russian President Vladimir Putin will affect the way U.S.-China competition plays out. Without accounting for the integrated nature of distinct U.S. foreign policy challenges abroad, Colby's recommended strategic focus on China defines U.S. interests primarily in terms of perceptions

of the threat from China. The risk in this is that the power to define American interests abroad could transfer to Chinese President Xi Jinping. This is especially dangerous because Beijing's leadership might use this position to pressure the United States to spend time and resources on areas that are not fundamentally linked to U.S. national security interests. A well-balanced strategy, one that is regionally focused, but not too narrowly, lies between the insights from Colby's and O'Hanlon's work.

Is *The Strategy of Denial* worth reading? Yes. Even if defense and security professionals do not buy the strategy or the recommendations Colby offers, the book is still a useful and important exercise in thinking about an approach to dealing with China in the Indo-Pacific and what a future conflict with China could portend. The good parts of Colby's arguments are valid and will challenge the reader to think differently, though partially offset by those that are of diminishing value. Despite these drawbacks, most readers will appreciate the complexities of formulating a national defense strategy for the Indo-Pacific, as well as what a conflict with China could look like. JFQ

Major Travis Zahnow, USA, is a Strategist and currently an Art of War Scholar at the Command and General Staff College.



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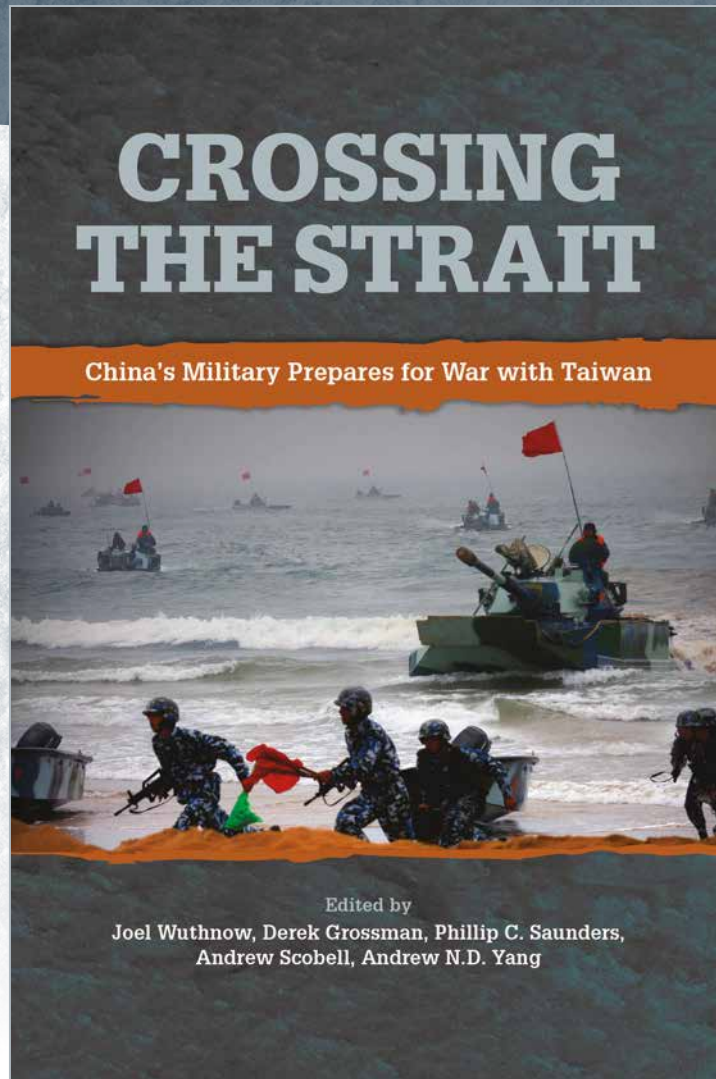
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By David C. Gompert and Hans Binnendijk

At certain times, the character of naval warfare undergoes revolution. The American Civil War was such a time, and its lessons still resound. Because the war began suddenly when secession followed Abraham Lincoln's election, the Union was unprepared to blockade the South. Its small navy had mainly wooden-hulled sailing ships with poor gunnery. Consequently, only 1 in 10 Confederate blockade runners was interdicted in the first year. What followed was a dramatic shift to ironclad steam-driven warships with accurate guns. Before long, Union ships were demolishing Confederate forts, closing Southern ports, and fighting jointly with Union ground forces. The paradigm born then—strategy and technology producing winning capabilities, multiplied by industrial mobilization—is later evident in the carrier, nuclear propulsion, and networking naval revolutions. Another revolution is needed now to thwart China's attempt to gain military advantage in the Pacific. We know from the Civil War and since that bold and inventive leadership is crucial.

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