



National Defense Industrial Strategy

DEPARTMENT OF DEFENSE

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Foreword from the Deputy Secretary of Defense

With the publication of the 2022 National Defense Strategy (NDS), Secretary Austin charted the Defense Department's way forward through this decisive decade. Increasingly coercive actions taken by the People's Republic of China demonstrates its intent to reshape the Indo-Pacific region and broader international system to fit its authoritarian preferences, and the Russian Federation's invasion of Ukraine underscores the acute threat it poses. These threats, along with transboundary challenges like COVID-19, demonstrate the imperative for increased and improved defense capabilities for both the United States and our allies and partners.

As the NDS states, "we will prioritize coordinated efforts with the full range of domestic and international partners...to fortify the defense industrial base, our logistical systems, and relevant global supply chains against subversion, compromise, and theft."¹

In observing these events, we've learned a great deal about the challenges within our defense industrial base and the critical importance of maintaining a robust, resilient, and dynamic defense industrial base. We now have an opportunity to address those challenges, including increasing our production capacity and strengthening our supply chains.

The National Defense Industrial Strategy (NDIS) offers a strategic vision to coordinate and prioritize actions to build a modern defense industrial base that is fully aligned with the NDS. It also calls for sustained collaboration and cooperation between the entire U.S. government, private industry, and our Allies and partners abroad.

Developing and empowering this modern defense industrial base is key to integrated deterrence and building enduring advantages. By aligning policies, investments, and activities inside and outside the Department in a manner that is tailored to specific competitors, our industrial base can strengthen deterrence to maximum effect. Should deterrence fail, the NDIS postures our industrial base to provide our warfighters the necessary capabilities – at speed and scale – to defeat any nation that attempts to harm the security of the United States, our allies, and our partners.

The current and future strategic considerations require immediate, comprehensive, and decisive action in strengthening and modernizing our defense industrial base to ensure the security of the United States and our allies and partners. As this strategy makes clear, we must act now.



Kathleen H. Hicks
Deputy Secretary of Defense

¹2022 National Defense Strategy of the United States, October 27, 2022 (Page 20)

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Introduction



1 Introduction

A robust and resilient industrial base provides the enduring foundation for military advantage. While America continues to generate the world's most capable weapons systems, it must have the capacity to produce those capabilities at speed and scale to maximize our advantage.

Accordingly, the 2022 National Defense Strategy (NDS) prioritizes strengthening the industrial base to “ensure that we produce and sustain the full range of capabilities needed to give U.S., allied, and partner forces a competitive advantage.”² Doing so builds on lessons learned in recent decades and the enduring advantage of the global international economic order, which has proven to be a major strength for the U.S. and our allies.

Over the past century, U.S. industrial might overwhelmed the Axis powers in World War II and contributed significantly to deterring the Soviet Union during the Cold War. The “peace dividend” and “procurement holiday” that followed saw dramatic cuts in military force structure, weapons production, and corresponding stockpiles of munitions and materials. Most notably, the traditional Defense Industrial Base (DIB) consolidated in the wake of the Secretary of Defense meeting with the major prime contractors and their suppliers in 1993 at what became known as the “Last Supper.”³

Significantly, this post-Cold War period saw the wider contraction of America's overall production capacity across many industries. Commercial manufacturing and related supply chains migrated

² 2022 National Defense Strategy of the United States, October 27, 2022 (Page 20)

³ The “Last Supper” refers to an announcement to industry by then Deputy Secretary of Defense, William J. Perry, announcing a shift in DoD policy to encourage consolidation among defense contractors.

overseas, including materials and components relevant to military needs. Over three decades the People's Republic of China became the global industrial powerhouse in many key areas – from shipbuilding to critical minerals to microelectronics – that vastly exceeds the capacity of not just the United States, but the combined output of our key European and Asian allies as well.

The events of recent years dramatically exposed serious shortfalls in both domestic manufacturing and international supply chains. The COVID-19 crisis demonstrated America's near wholesale dependency on other nations for many products and materials crucial to modern life.⁴ Long-standing mobilization authorities, such as the Defense Production Act, were needed in the first months of the crisis to prevent expected shortages in medical equipment and other crucial items.

The Russian Federation's full-scale invasion of Ukraine in 2022, followed the next year by attacks by Hamas on Israel, uncovered a different set of industrial demands and corresponding risks. The U.S. defense industry has been called on to surge production of military equipment in large quantities, especially munitions – from 155mm military artillery shells, a staple of armies since the First World War, to the most sophisticated missile defense systems.

The National Defense Industrial Strategy (NDIS) – the first of its type to be produced by the Department of Defense – provides a path that builds on recent progress while remedying remaining gaps and potential shortfalls. This NDIS recognizes that America's economic security and national security are mutually reinforcing and, ultimately, the nation's military strength depends in part on our overall economic strength.

This comprehensive NDIS aims to answer the question: How do we prioritize and optimize defense needs in a competitive landscape undergirded by geopolitical, economic, and technological tensions? Tradeoffs typically occur between cost, speed, and scale. However, the lessons learned since the "Last Supper" and highlighted by current acute threats illustrate that the DoD needs to move aggressively toward innovative, next-generation capabilities while continuing to upgrade and produce, in significant volumes, conventional weapons systems already in the force.

As such, the DoD seeks to be more adaptable to changes in the competitive landscape. We must optimize for dynamic production and capabilities. In addition to the traditional defense industrial base, we will accelerate the growth of a more dynamic, and resilient modern defense industrial base.

To date, the federal government has enacted industrial policies that guide the NDIS. This includes a range of Executive Branch policy actions. For instance, Executive Order (EO) 13806 called for policies that promote a vibrant domestic manufacturing center, a vibrant DIB, and resilient domestic supply chains. More recently, EO 14017 called for action to strengthen America's supply chains. Additionally, EO 14028 emphasized the need for the private sector to recognize and continuously adapt to the constantly evolving cyber-threat to ensure products are built and operate effectively, while ensuring that critical information and technologies are protected.

In the international capital and trade arena, EO 14083 elaborates and expands on the existing list of factors that the Committee on Foreign Investment in the United States (CFIUS) considers when reviewing transactions for national security risks. Complementing this CFIUS reform, EO 14105 regulates outbound investments in which United States capital is being invested in certain entities within certain countries of concern, and it provides a mechanism to limit U.S. investment in adversarial defense economies, limiting those adversaries' ability to compete with the U.S. DIB.

⁴ *Active-Duty Support to COVID-19 Response: DoD Support to Date, August 2023, U.S. Northern Command*

The DoD has taken action to support these Executive Orders. Since the supply chain-focused executive order (EO 14017) was issued in February 2021, the DoD has obligated over \$893 million using the Defense Production Act for investments in five critical sectors (kinetic capabilities, microelectronics, energy storage and batteries, strategic and critical materials, and castings and forgings). The DoD will address technological challenges with forward-looking initiatives such as the Industrial Base Analysis and Sustainment (IBAS) program aimed at maintaining the health of vulnerable DoD suppliers and capabilities.

Additionally, the DoD maintains the Manufacturing Technology program (ManTech), a DoD investment portfolio that seeks to develop advanced manufacturing processes, techniques, and equipment to develop, produce, and sustain weapon systems, and Additive Manufacturing (AM) Forward, a voluntary compact among large manufacturers to help small suppliers increase use of additive manufacturing. Increased investment in artificial intelligence-powered predictive capability will help the DoD accomplish these technological challenges.

Guided by this first-of-its-kind strategy, the DoD will develop more resilient and innovative supply chains, invest in small- and medium-sized businesses, and strengthen and grow American innovation and manufacturing systems across both the private sector and the government-owned organic industrial base (OIB). DPA, IBAS, ManTech, AM Forward, and similar efforts will bolster and expand America's ability to innovate and produce the warfighting capabilities at a speed and scale that will help guarantee the ability to fight and win in any conflict.

We need to shift from policies rooted in the 20th century that supported a narrow defense industrial base, capitalized on the DoD as the monopsony power, and promoted either/or tradeoffs between cost, speed, and scale. We need to build a modernized industrial base that includes the traditional defense contractors – the DIB primes and sub-tier defense contractors who provide equipment and services – and also includes innovative new technology developers; academia; research labs; technical centers; manufacturing centers of excellence; service providers; government-owned, contractor-operated (GOCO) facilities; and finance streams, especially private equity and venture capital.

The DoD seeks to catalyze generational rather than incremental change in order for our industrial base to meet the strategic moment. The contraction of the traditional DIB (both commercial and organic) was a generation-long process and it will require another generation to modernize the DIB.

Accordingly, building a more robust, modernized defense industrial base will require a dynamic effort across the U.S. government to create the legal and policy conditions that allow new entrants into the defense production and services community. We must solicit entrants of all types: large and small, domestic, and foreign, and those with no previous relationship to the DoD or defense production. This will require reinvigoration and the development of new dialogues and relationships. The DoD must consider the impact of government policies and decisions on industry, just as its adherents must appreciate their critical role in providing for the defense of the nation and consider the impact of their business practices on national security.

1.1 Strategic Framework

1.1.1 Priorities

The NDS showed that building enduring industrial advantages through a resilient defense base is imperative, to include supporting our allies and partners with key capabilities to strengthen integrated deterrence.

Some of this simply reflects total demand. Between 1985 and 2021 – even with the Afghanistan and Iraq conflicts – the Department’s budget as a percentage of U.S. GDP shrank from 5.8 percent to 3.2 percent⁵ with corresponding contractions of defense-oriented companies and a reduction of nearly two-thirds of the associated workforce.⁶ Building enduring advantages through a resilient defense industrial base requires that the DoD optimize for dynamic production and capabilities the nation needs despite cost constraints.

The NDIS lays out four long-term priorities to serve as guiding beacons for industrial action and resource prioritization in support of the development of a modern industrial base that supports the nation’s defense. The overarching goal is to make the industrial base dynamic, responsive, state-of-the-art, resilient, and a deterrent to our adversaries.

The NDIS seeks to achieve in four critical areas:

- **Resilient Supply Chains**
- **Workforce Readiness**
- **Flexible Acquisition**
- **Economic Deterrence**

1.1.2 Challenges

Achieving our priorities depends on the numerous stakeholders in national security and the defense industry – executive branch departments and agencies, government owned facilities, traditional defense contractors, non-traditional companies, and our global Allies and partners—to effectively collaborate in surmounting the complex known and unknown technical, manufacturing, and logistical challenges. To realize these 21st century industrial priorities, the Department will need to address systemic challenges:

- **Underutilization of Multi-Use Technologies:** DoD currently underutilizes innovations and advancements originally developed for non-military purposes that could be quickly and cost-effectively adapted for military use.
- **Inadequate Workforce:** The labor market lacks the required number of skilled workers to meet defense production demand while driving innovation at all levels. This shortfall is becoming exacerbated as baby boomers retire, and younger generations show less interest in manufacturing and engineering careers.
- **Inadequate Domestic Production:** Uncertain DoD funding, the prolonged cost-driven offshoring that has been pervasive across the U.S. manufacturing sector, and disincentives to modernize manufacturing processes or maintain excess capacity has resulted in DoD’s

⁵ Under Secretary of Defense (Comptroller). *National Defense Budget Estimates for 2023, July 2022. (Table 7-7, Pages 294-296)*

⁶ Congressional Research Service. *The U.S. Defense Industrial Base: Background and Issues for Congress, October 13, 2023. (Page 5)*

overreliance on single or adversarial foreign sources for key materials and production capacity.

- **Non-Competitive Practices:** Unfair trade practices in the post-Cold War era, especially non-competitive policies employed by our adversaries (e.g., unfair subsidies, dominance-driven acquisitions, hidden ownership, transfer of critical technology, flouting trade agreements), have harmed U.S. and Allied defense-related industry.
- **Long Lead Times and Sub-Par Readiness:** Many elements of the traditional DIB have yet to adopt advanced manufacturing technologies, as they struggle to develop business cases for needed capital investment. This directly impacts DoD's ability to reduce manufacturing lead times and lifecycle costs, and to increase readiness.
- **Fragility of Sub-Tier Suppliers:** Sub-tier suppliers can sometimes operate on narrow profit margins, making them susceptible to cyclic demand and shifts in defense budgets. This affects the ability of sub-tier suppliers to remain in the defense market, with potentially outsized downstream consequences for defense industrial capacity and production lead-times.
- **Lack of Market Share, Over-Customization, and Obsolescence:** DoD is not a large player in most industrial markets. DoD's low volume buying patterns, lengthy periods between modernization, and often unnecessarily over-customized design specifications have combined to make DoD an unattractive customer, especially for smaller businesses.
 - **Instability of Procurement:** Several factors, including changing priorities, program cancellations, compliance burdens, funding challenges, and technology obsolescence, have disincentivized the traditional DIB to maintain production capacity beyond short-term, steady-state projections of defense demand.
- **Funding Uncertainty and Constraints:** Budget uncertainty, fiscal year spending constraints, and political factors have adversely impacted DoD's ability to ramp up traditional DIB capabilities to provide an extra margin of production capacity, to modernize, and to replenish inventories in a timely manner. Lapses in appropriations exacerbate these challenges by increasing budget uncertainty, impeding operational planning and coordination, weakening morale, and dampening ally and partner confidence in the United States. Continuing resolutions further compound funding challenges: they prohibit new starts for contracts or programs, disrupt recruiting, retention, and personnel moves, and severely impact military readiness.
- **Limited Visibility into International Ally and Partner Requirements:** As we seek to improve planning for delivery of military capabilities to international partners and to stabilize critical supply chains, improved visibility of partner requirements is imperative – with a view to operational use rates – and accelerated DoD contracting timelines to gain maximum leverage in the global market.

AUKUS: An Industrial Base Opportunity Brings Challenges

On September 15, 2021, the leaders of Australia, the United Kingdom, and the United States announced AUKUS, a new trilateral security partnership to promote a free and open Indo-Pacific region and support a stable international order that respects the rule of law, human rights, and the peaceful resolution of disputes free from coercion. AUKUS provides an opportunity for all three nations to enhance capabilities, improve interoperability, and strengthen integrated deterrence.

AUKUS is organized with two “Pillars.” Pillar I centers on Australia’s acquisition of a sovereign conventionally armed, nuclear-powered attack submarine capability. Under Pillar II, Australia, the United Kingdom, and the United States will develop and field joint advanced military capabilities to promote security and stability in the Indo-Pacific region.

Delivering on the promise of AUKUS is requiring us to address key industrial base challenges:

- Workforce issues in all three nations
- Mechanisms to share CUI and classified information with industry and foreign partners
- Interoperability with allies and partners
- Navigating national exportability regulations
- Built-in flexibility to expand partnership to other nations in future
- Lengthy national acquisition processes and timelines
- Coordinating joint requirements

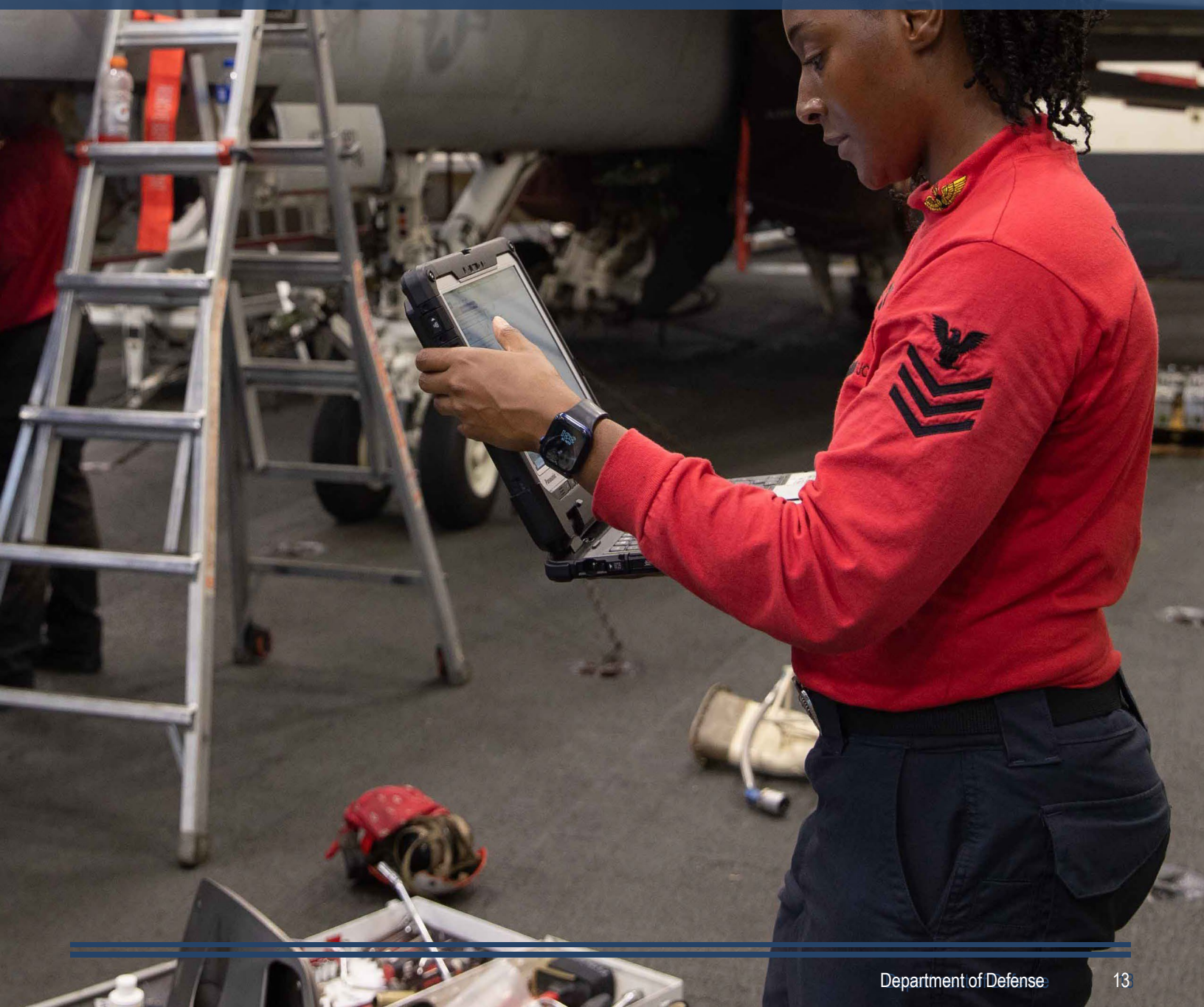
Addressing these challenges is crucial, not just for the success of AUKUS, but to meet the United States’ pacing challenge more broadly.

1.1.3 Approach

The purpose of this National Defense Industrial Strategy is to drive development of an industrial base that provides a sustained competitive advantage to the United States over its adversaries. This strategy outlines why a modernized, 21st Century defense industrial base contributes to the NDS objective of Integrated Deterrence by organizing, establishing, and building the foundational elements of military capability. In building these foundational elements, the United States sends a message of reassurance to our international allies and partners and of warning to our adversaries.

Building on the strategic framework, the NDIS outlines four priorities that will catalyze the changes needed to build a modernized defense industrial base. Each of the four priorities has associated long-term actions that promote flexibility and dynamic capabilities as we build this system. This strategy will describe the priorities and actions as well as the risks posed if we fail to act.

Resilient Supply Chains





2.1 Resilient Supply Chains

2.1.1 Summary

Priority Defined: The DIB can securely produce the products, services, and technologies needed now and in the future at speed, scale, and cost.

The 2022 National Defense Strategy defines resilience as the ability to withstand, fight through, and recover quickly from disruption.⁷ Dynamic production is primarily concerned with managing production processes and capacities to meet the changing demands of our warfighters, allies, and partners at speed and at scale. Resilient supply chains and dynamic production share the goals of adaptability, responsiveness, and scalability. The near-term efforts of the interagency Supply Chain Disruptions Task Force have helped to break down silos and achieve new forms of collaboration between Federal departments and agencies and with allies and partners, enabling timely action to address supply chain disruptions. Long-term efforts, however, require further steps to institutionalize supply chain resilience throughout the DIB, DoD, and extend through the USG and our allies and partners.

The DoD must balance the needs for speed and scale with cost and requires resilient, healthy, dynamic, and secure supply chains to ensure the development and sustainment of capabilities critical to national security. Currently, the health of sub-tier suppliers, manufacturing capacity, and lack of visibility into our critical supply chains create unique challenges that must

⁷ 2022 National Defense Strategy of the United States, October 27, 2022 (Page 8)

be addressed to meet national security objectives. This is a particularly acute issue for small businesses who face various obstacles in helping DoD meet its challenges. Unreliable cash flow to small businesses makes the DIB more fragile and less secure, and this is driven by a range of issues from appropriation delays to commonly used contracting practices. Regulations and business practices can be difficult to understand, costly to implement, and in a myriad of ways often create barriers to doing business with DoD. Some of these barriers include confusing points of entry into defense markets, improper bundling and consolidation of contracts, and convoluted regulations. These barriers strain the relationship between the DoD and small businesses. By working with both large and small businesses and more strategically utilizing the Organic Industrial Base (OIB), the DoD will achieve a more resilient, modernized industrial base that is economically competitive, receives predictable demand signals, and does not depend on adversarial foreign sources of capital, technology, raw materials, and critical inputs.

The War in Ukraine and Its Implications for Production

Russia's invasion of Ukraine has shown the high global demand for Western weapon systems from the US and its allies and partners. Existing defense industrial capacity has had to expand rapidly to replace spent stocks in a suitable timeframe. Prior to the invasion, weapon procurements for some of the in-demand systems were driven by annual training requirements and ongoing combat operations. This modest demand, along with recent market dynamics, drove companies to divest excess capacity due to cost. This meant that any increased production requirements would require an increase in workforce hours in existing facilities—commonly referred to as “surge” capacity. These, in turn were limited further by similar down-stream considerations of workforce, facility, and supply chain limitations. For example, the war in Ukraine increased demand for 155mm artillery ammunition. In response, the DoD has invested in expanding existing production facilities in Scranton, Pennsylvania and broke ground on a new production facility in Mesquite, Texas to respond to the higher demand signal. In addition to these investments made in December 2022, the U.S. Army awarded contracts worth \$1.5 billion in September 2023* to meet its goal of delivering more than 80,000 projectiles per month by the end of FY2025. This represents a 200% increase of production capacity within a two-year span and demonstrates the DIB's ability to scale rapidly.**

* Army Public Affairs. October 5, 2023. https://www.army.mil/article/270636/army_making_significant_strides_in_artillery_production_as_fiscal_year_ends

* Christopher Hurd. Army News Service. November 14, 2023. https://www.army.mil/article/271572/strengthened_army_industrial_base_doubles_artillery_production






Ensuring the health of sub-tier suppliers is crucial to a healthy and modernized DIB. The DoD must explore ways to better assess the health of the subcontractor industrial base, while at the same time applying the full range of authorities and opportunities available to develop innovative acquisition techniques that strengthen mechanisms to ensure prime contractors are accountable for meeting their small business subcontracting plans. The DoD will continue accelerating payments to small businesses and seek ways to incentivize large prime contractors to do the same with small business subcontractors, to include assessment of ways to address slow cash flow through existing accounting practices and business systems.

In addition to enabling integration of small businesses, the DoD must leverage the USG-owned OIB,⁸ which complements the commercial DIB by providing a ready and controlled source of technical competence to support the force structure and requirements identified by strategic and

⁸ The Organic Industrial Base (OIB) includes a network of maintenance depots, shipyards, fleet readiness centers, air logistics complexes, manufacturing arsenals, munitions plants, and software engineering activities.

contingency plans. These core logistics capabilities are those necessary to support reconstitution in a national emergency or contingency requirement. The OIB performs a wide range of important roles from manufacturing items such as gun-tubes, to producing explosives, propellants, and munitions, to providing depot-level maintenance for complete rebuilds on such items as aircraft, ground vehicles, and engines, to major overhauls on nuclear-powered submarines and aircraft carriers. The OIB also sustains older platforms that are not profitable to the private sector. The OIB further provides rapid surge capability and capacity to support contingencies, and it is revitalized and enlarged when greater sustained commitment is called for.

OIB infrastructure has gradually degraded over time, with many critical facilities dating to World War II or before, and depot equipment often becoming obsolete. This lack of modernization has impacted cycle times, depot efficiency, and capacity. While the Military Services are modernizing OIB facilities and tools, these efforts will require substantial resources to meet future warfighter needs. For example, the Army is preparing to invest \$4.5 billion over the next 15 years to modernize its OIB capabilities. This will be similar and complementary to the substantial investments required to modernize commercial DIB facilities and capabilities.

ACTIONS to ACHIEVE RESILIENT SUPPLY CHAINS		
	Incentivize industry to improve resilience by investing in extra capacity	<ul style="list-style-type: none"> Establish public-private partnerships, risk-sharing mechanisms,
	Manage inventory and stockpile planning to decrease near-term risk	<ul style="list-style-type: none"> Increase stockpiles of strategic and critical systems Ensure effectiveness of ad hoc working groups tasked with rapidly expanding production and building inventories
	Continue and expand support for domestic production	<ul style="list-style-type: none"> Promote accelerator programs to foster innovation Deploy innovative funding mechanisms to revitalize the OIB
	Expand supplier base and invest in new production methods	<ul style="list-style-type: none"> Expand relationships with companies and industries not traditionally in the DIB Mitigate cybersecurity costs of entry to work in the defense industrial base Promote investment in advanced manufacturing automation
	Leverage data analytics to improve sub-tier visibility to identify and minimize strategic supply chain risks and to manage disruptions proactively	<ul style="list-style-type: none"> Leverage greatly expanded supply chain visibility to mitigate risks and to manage disruptions proactively, aggressively, and systematically

ACTIONS to ACHIEVE RESILIENT SUPPLY CHAINS



Engage allies and partners to expand global defense production and increase supply chain resilience

- Strengthen international defense production relationships
- Build production strengths via multiple international collaboration mechanisms



Improve the Foreign Military Sales (FMS) process

- Collaborate with Departments of Commerce and State to enable FMS to drive commercial sustainability



Enhance industrial cybersecurity

- Build upon and improve current regulations, policies, requirements, programs, and other efforts to address challenges and evolving cyber threats

2.1.2 Actions

2.1.2.1 Incentivize Industry to Improve Resiliency by Investing in Extra Capacity

Spare production capacity refers to the excess capacity a company or organization maintains beyond its current production needs. This capacity can be essential for accommodating increased demand, including demand from allies and partners, handling unexpected disruptions, or supporting growth. The key components of spare production capacity are physical infrastructure (production facilities, machinery, storage space to support increased production), workforce (available and flexible pool of skilled labor), input materials (inventory, stockpiles, supply), cyber defense and protection, and management systems (demand, supply chain, production, quality assurance, risk/scenario, optimization, financial). Technological modernization can confer production flexibility, allowing rapid conversion from one production item or type to another; and bring greater production output and logistics throughput. Developing spare production capacity can include introducing new suppliers to the defense industrial base.

Encouraging defense suppliers to build substantial spare production capacity will require a coordinated effort by industry, Congress, DoD, and other federal departments and agencies; a public recognition of the associated burden to the taxpayer and the economy itself; and a broad acceptance of the defense industry, including our global industrial partners, as vital for national defense. Congress can explore allocating additional funding for contracts and other incentives (tax incentives, regulatory relief, long-term contracts) aimed specifically at building and maintaining spare production capacity. Such funding can be used to modernize and expand facilities and develop flexible production. The DoD will seek to establish risk-sharing mechanisms and technology-sharing structures to jointly fund, develop, and secure spare production capacity. The DoD will also plan for needed spare production capacity and to provide oversight authority to ensure successful development and sustainment follow-through.

2.1.2.2 Manage Inventory and Stockpile Planning to Decrease Near-Term Risk

Increase Stockpiles of Strategic and Critical Materials: The DoD maintains stockpiles of strategic minerals, critical chemicals, medical supplies, critical parts, and essential technology. These inventories and stockpiles act as shock absorbers for the supply chain and help to mitigate near-

term risks, including from unanticipated demand spikes or supply chain disruptions. However, recent geopolitical events have spotlighted gaps in national stockpiles and challenges in replenishing existing ones. To mitigate vulnerabilities in the supply chain, the Department will embrace an expanded approach to stockpile and inventory planning. Working with industry, the DoD will expand existing and establish new stockpiles of the critical parts, finished goods, and commodities needed to meet production requirements for conducting sustained campaigns against adversaries. The DoD will also identify stockpiling requirements for critical minerals and critical components necessary to continue production in cases where international conflict or crisis may inhibit normal functioning of the supply chain.

Joint Production Accelerator Cell (JPAC)

JPAC spearheads efforts to increase munitions, weapons platforms, and other materials production rapidly by coordinating across the Department and with other agencies and production partners. JPAC is the successor to the Munitions Industrial Deep Dive (MIDD) organization that was formed in response to the Ukraine crisis. JPAC is a tactical, problem-solving cell that leverages analytical processes and current authorities to be less crisis-driven and empower more proactive, forward-looking decision-making to support more responsive weapons production. The organization focuses on three main efforts: scaling production in line with Department priorities through direct investment in suppliers; building surge capacity, including identifying opportunities to introduce and leverage new production techniques, advanced manufacturing, and digital engineering; and engaging allies and partners to identify and address global production constraints. JPAC's efforts have directly contributed to \$2 billion in investments in the weapons industrial base.

Ensure Effectiveness of Ad Hoc Working Groups Tasked with Rapidly Expanding Production and Building Inventories: DoD production- and capability-focused working groups bring leaders and subject matter experts from across the DoD, other agencies, and industry together to mitigate critical near-term defense production and supply chain risks. The DoD and other organizations have done critical work with ad-hoc committees to coordinate supply chains through a network of symbiotic relationships with commercial and government-owned suppliers and manufacturers. DoD will regularly evaluate the efforts of these working groups to ensure their utility. These evaluations will aid in providing a comprehensive view of the relevant supply chains to confirm whether producers are making appropriate prioritization decisions and acting to avoid production bottlenecks and disruptions. They will also aid in identifying inventory shortfalls whether due to shortages of source materials, production capacity or capability constraints, acquisition issues, or logistics management mechanisms. Additionally, the DoD will establish a top-down common methodology to calculate source material availability and upstream production requirements, including capacity requirements. This will support effective and timely stockpile and inventory replenishment and downstream production goals, particularly as material requirements cross multiple production efforts or require prioritization of critical and limited materials.

2.1.2.3 Continue and Expand Support for Domestic Production

Promote Accelerator Programs to Foster Innovation: DoD organizations like the Defense Innovation Unit (DIU) speed up the development and production of emerging technologies and products, such as autonomous systems, quantum technology, artificial intelligence, and advanced materials that can serve the needs of both the military and the civilian economy. They do so by fostering collaboration between typically nontraditional companies and established contractors,

research institutions, and government agencies for focused problem solving with clearly defined objectives and to address pain points that can limit integration and scale. The Department will seek opportunities to expand these efforts. Since many defense technologies require extended research, development, and testing timelines, the DoD will also consider longer program durations to accommodate the unique, lengthy, and costly challenges of defense innovation and post-program support, such as access to follow-up funding, business development opportunities, and continued mentorship. DoD will continue to facilitate non-programs of record as part of the FMS program to provide allies and partners with relevant priority capabilities to support their own national security needs.

Deploy Innovative Funding Mechanisms to Revitalize the OIB: The OIB is the network of U.S. government-owned defense industrial facilities including both government-owned, government-operated (GOGO) and GOCO sites. The OIB serves two primary purposes: (1) production of items such as missiles, munitions, and gun tubes, that are not economical for private enterprise to manufacture; and (2) depot-level maintenance, typically requiring complete overhaul, including armored ground systems, sea-going ships, and aircraft.⁹ DoD is funding the recapitalization and modernization of Army and Navy OIB missiles and munitions production plants, all of the Services' maintenance depots, and the Navy's shipyards using innovative funding mechanisms.¹⁰ This strategy is regenerating required capacity and capability and will guide the Department as it works with Congress to fund the full modernization and resourcing of OIB infrastructure, process improvements, and workforce. DoD will work to establish a better understanding of the conditions that cause long-term modernization programs to encounter unexpected increases in cost estimates and schedule delays and exercise patience accordingly.

2.1.2.4 Expand Supplier Base and Invest in New Production Methods

Expand Relationships with Companies and Industries not Traditionally in the DIB: Today America has unique economic and technological advantages in information technology, advanced analytics, materials science, and advanced fabrication technologies, as compared to the manufacturing capabilities of the Machine Age that led to our victory in World War II. An important aspect of this change is that the era where technological breakthroughs were primarily dependent on government research and development funding is in the past. Some of the advanced capabilities that the Department would like to leverage to support warfighters can come from the commercial sector. Commercial entities now make significant investments in advancing capabilities in critical technology areas such as artificial intelligence, advanced computing, and biomanufacturing. Many of the companies or organizations engaged in these areas are not traditionally considered part of the defense industrial base. Additionally, there are businesses from socio-economic categories that are underutilized in the DIB.¹¹ Data from the Small Business Administration (SBA) shows that federal contracting to small businesses owned by underrepresented socio-economic groups accounts for less than 10% of all federal contracting dollars. These suppliers come from varied industries and can bring technological, production, and process advancements to the defense sector. Expanding services and industrial capabilities carries significant investments and requires

⁹ In addition to these two primary functions, the OIB fields capabilities that blur into prototyping, testing, and pilot production (small scale production which is then licensed to commercial manufacturers for large-scale production). Further, it is increasingly involved with the production, stockpiling, and management of critical chemicals, particularly as it relates to energetics used in propellant and explosives. OIB facilities also safely dispose of conventional munitions that are beyond their useful life and, historically, of chemical weapons that were banned by convention.

¹⁰ Certain OIB capabilities and capacities are presently being rapidly restored. These rapid recapitalization and modernization efforts have employed innovative "hybrid model" funding, involving substantial multi-year direct appropriation commitments to pave the way forward to meet current and anticipated threats.

¹¹ Such as business in HUBZone areas, Small Disadvantaged Businesses (SDB), Service-Disabled Veteran Owned Small Businesses (SDVOSB), Women Owned Small Businesses (WOSB), etc.

access to materials and market development. To leverage these nascent relationships and the opportunity for capability and capacity growth, DoD will build and deepen relationships with commercial industries not traditionally involved in defense work. Not only will working with these “nontraditional suppliers” broaden the DIB, but it will also foster competition within the defense market.

Mitigate Cybersecurity Costs of Entry to Work in the Defense Industrial Base: High

barriers to entry disincentivize the types of small or sub-tier suppliers that help to make the industrial base more resilient from doing business with the DoD. Contracting with the DoD also requires small businesses to incur additional costs, such as maintaining appropriate cybersecurity measures. These costs, which can more easily be borne by larger firms, can dissuade smaller companies from participating in the DIB. The DoD will seek to improve communications and outreach through public-private partnerships so that small businesses are aware of not only DIB cybersecurity regulations, policies, and requirements but also available DoD and industry cybersecurity services and support. The Department is committed to reducing barriers to entry for small and medium-sized businesses, including impediments associated with implementing and maintaining cybersecurity. The DoD, in collaboration with the DIB, will seek to identify opportunities so that commercial cybersecurity services and solutions can better address the needs of small businesses.

The Department will explore opportunities to expand programs that mitigate costs of entry for promising, small and non-traditional businesses that improve DoD’s technology edge and capabilities. Examples of these programs and offices include the Defense Production Act (DPA) loan and loan guarantee programs; the Office of Strategic Capital; DoD DIB Cybersecurity Program; Resilience Project Funding; Mentor Protégé Program (MPP) and APEX Accelerators to help small businesses with technical and business developmental assistance, and programs to help DoD-focused small business with design and production. Additionally, the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs invest more than \$1 billion annually in small business technology.¹² These programs can, in connection with mentor programs, help small business to navigate qualification and be worthwhile barrier reduction programs.

Promote Investment in Advanced Manufacturing Automation: Advanced manufacturing automation streamlines and compresses development and production processes, reduces human intervention, lowers unexpected downtime, and improves overall manufacturing performance. Today’s advanced manufacturing automation is the result of decades of symbiotic interactions between the public and private sectors and separate independent private sector-driven advances. Some elements of the DIB, however, have yet to adopt advanced manufacturing technologies, due to either post-Cold War industry atrophy, offshoring, or redirection of available investment capital. Through new initiatives like Advanced Manufacturing (AM) Forward as well as continued work in advanced manufacturing applications in production and sustainment of key components, the DoD seeks to produce more advanced technologies in the U.S. through investments in regional manufacturing systems. DoD will expand efforts to incentivize, invest in, and otherwise promote the use of advanced automation technologies by defense suppliers to reduce total life cycle costs and increase readiness, and, as appropriate, to fill workforce gaps.

¹² SBIR and the STTR are coordinated by the Small Business Administration, an independent agency of the United States government that provides support to entrepreneurs and small businesses. The main difference between the SBIR and STTR programs is that the STTR program requires the company to have a partnering research institution which must be awarded a minimum of 30% of the total grant funds.

2.1.2.5 Leverage Data Analytics to Improve Sub-Tier Visibility to Identify and Minimize Strategic Supply Chain Risks and to Manage Disruptions Proactively

Supply chain visibility is the ability to track parts, materials, and services from prime contractors back to sub-tier level suppliers and sources—effectively from the raw materials to the end-product. This includes the associated transportation and warehousing logistics chain for the prime contractor and their suppliers. The goal of supply chain visibility is to better manage the DoD's supplier base by reducing the effect of supply chain disruptions on military readiness.

In a 2022 report, the DoD acknowledged that as its supply chain became more global, prime contractors lost sight of their own sub-tier supply chains and faced the risk of sourcing resources from potential adversaries. Furthermore, the pandemic demonstrated that seemingly minor disruptions in the DoD's supply chain can cause massive ripple-effect bottlenecks owing to limited supply sources. In recognition of this limited visibility into its sub-tier supply chains,¹³ the DoD initiated efforts to ensure supply chain visibility, particularly in sub-tiers, and intends to further this capability throughout all tiers of the supply chain. DoD will leverage this greatly expanded supply chain visibility to mitigate risks and to manage disruptions proactively, aggressively, and systematically. Additionally, DoD recognizes the critical role played by defense primes in bringing sub-tier suppliers into the defense production fold and will work collaboratively with them to achieve enhanced supply chain visibility and function. Complementing greater supply chain visibility, the DoD will also improve the sharing of supply chain risk indicators across the DoD and the interagency where appropriate. This can help establish methods for the Department and the whole of government to better share identified supply chain risk indicators with industry.

DoD and the Domestic Supplier Base



7.1 Million

fewer people in US manufacturing jobs since 1979, or 36% of the industry's workforce



3.2% of U.S. GDP

is spent on military expenditures compared with 5.89% in 1973 or 8.8% in 1963



1.9 Million

fewer people employed in Defense Industrial Base companies since 1985, 63.5% reduction

2.1.2.6 Engage Allies and Partners to Expand Global Defense Production and Increase Supply Chain Resilience

The global activity of pacing threats increasingly requires a global approach to defense industrial relationships, concerns, and competition. International allies and partners, each with their own robust defense industries, will continue to be a cornerstone of the DoD's concept of Integrated Deterrence. Indeed, the global system of alliances and partnerships is central to the NDS, which calls to incorporate allies and partners at every stage of defense planning. Such linkages and relationships will continue to be a cornerstone of Integrated Deterrence in resisting and, if necessary, defeating known and emerging threats.

However, since February 2022, we have uncovered material gaps in the ability of this international DIB to rapidly scale production. Our global supply chains are critical components of our defense industrial base, yet they are vulnerable, particularly in their sub-tiers. Developing secure alternative sources can involve years-long lead times to reach production scale.

¹³ *Securing Defense-Critical Supply Chains; An action plan developed in response to President Biden's Executive Order 14017, February 2022. (Page 18)*

Proactively developing, growing, and sustaining multiple, redundant, production lines across a consortium of like-minded nations is imperative for the U.S. to ensure adequate production capability and capacity while mitigating exposure to supply disruptions or changing production requirements. The DoD must develop a networked cooperative framework that enhances defense industrial output by working with allies and partners to de-risk supply chains and advance our ability to engage in co-sustainment, maintenance, repair, and overhaul.

“Production Diplomacy”: Multilateral Collaboration Lessons from the Ukraine Response

In the wake of the Russian Federation’s unprovoked aggression towards Ukraine, the U.S. led the international community to rally to their defense, organizing recurring engagements of the heads of Ministries of Defense and National Armaments Directors to coordinate support efforts. These engagements have jump-started initiatives to expand ammunition production, establish an international support fund, and organize the delivery and sustainment of critical capabilities.

Building off the global experience of the Ukraine conflict, there may be opportunities to similarly convene the leadership of allied and partner nations within the Indo-Pacific, to deepen multilateral collaboration on regional industrial base and manufacturing production challenges. Rather than wait for emergency circumstances, investing in these relationships now will yield fruit, should we collectively face a crisis in coming years. This is the power of production-oriented diplomacy.

Some of the multilateral alliances that have thus far made the greatest impact include the North Atlantic Treaty Organization (NATO), the Ukraine Defense Contact Group National Armaments Directors forum, the National Technology and Industrial Base (NTIB, which consists of Australia, Canada, New Zealand, and the United Kingdom), and AUKUS (Australia and the United Kingdom). It is worth noting that NATO has long recognized that a strong defense industry across the NATO alliance, including greater defense industrial cooperation with Europe and across the Atlantic, is essential to delivering required capabilities. Incorporating allies and partners into a more networked or web-like production chain would enable expansion in production, additional capacity for a longer contest, and incentives among regional partners to cooperate in resisting coercion from adversaries.

Strengthen International Defense Production Relationships: The DoD must work with allies and partners through both multilateral and bilateral agreements to boost defense production, innovation, and overall capability. With these priorities in mind, the United States is collaborating with our allies and partners to develop policies and arrangements that strengthen our respective DIBs and improve supply chain resilience. These mechanisms include Security of Supply Arrangements (SOSAs), which allow the Department and our foreign partners to request priority delivery of defense critical components from each other’s respective industrial bases – promoting government-to-government and international industrial cooperation and collaboration. The Department will continue to engage allies and partners globally to increase the number of such enabling arrangements in effect. Moving forward, DoD is committed to strengthening and expanding existing alliances and to forging new partnerships to enable the Joint Force and the forces of our allies and partners to increase capabilities and ensure redundant and secure sources of supplies for future needs.

Build Production Strengths Via Multiple International Collaboration Mechanisms: The DoD must also work with allies and partners to strengthen global supply chains through the multiple mechanisms at their disposal. These include exploring means to aggregate and amplify U.S. ally and partner demand signals for common munitions and weapon systems; minimizing customized

solutions where appropriate and standardizing exportability; investing in materiel solutions ahead of foreign demand and beyond Military Service requirements; licensing production of U.S. systems; and expanding foreign defense company production within the United States. Further, the DoD will work with partners and allies to commit to a renewed emphasis on interoperability, interchangeability, and materiel standardization to ensure not only that our forces are interoperable, but also that our respective DIBs can be mutually reinforcing.

2.1.2.7 Improve the Foreign Military Sales (FMS) Process

The FMS program is a critical tool used to achieve U.S. foreign policy objectives, as well as strategic outcomes identified in the NDS. As previously noted, a central premise of the NDS is that the United States operates by, with, and through its unmatched network of allies and partners. Integrated Deterrence requires close collaboration with allies and partners and deepens interoperability across the full spectrum of capabilities. FMS has the additional benefit of helping to achieve economies of scale by sharing some of the burden of acquisition and sustainment across the lifecycle of defense platforms, which in turn strengthens the global DIB. In an era of increased strategic threats, the Department is committed to improving planning for and the timely delivery of military capability to allies and partners.

To this end, the Department is accelerating the responsiveness of the FMS system, in cooperation with interagency partners, to better meet the global capability requirements of our allies and partners. These measures include: improving the Department's understanding of ally and partner requirements; enabling efficient reviews for release of technology; providing allies and partners relevant priority capabilities; accelerating acquisition and contracting support; expanding DIB capacity; and ensuring broad USG support to improve the FMS process. The FMS Continuous Process Improvement Board will provide guidance and oversight to identify and implement opportunities for improved FMS planning and processes. To reduce production timelines, the Department will incorporate ally and partner requirements into acquisition and contracting guidance and into ongoing efforts to expand DIB production capacity. The aim is to incentivize DIB investment in production capacity and building surge capability of high-demand, low-supply platforms, systems, munitions, and services informed by total U.S. and allied partner demand levels.

2.1.2.8 Enhance Industrial Cybersecurity

The Department, working with industry, will build upon and improve current regulations, policies, requirements, programs, services, pilots, communities of interest, public-private partnerships, and interagency efforts to address challenges and evolving cyber threats. This effort will be specifically guided by the DoD DIB Cybersecurity Strategy.

2.1.3 Illustrative Outcomes and Outputs

Table 1 on the following page presents the actions and corresponding illustrative outcomes or outputs to measure progress against the Resilient Supply Chains priority. Formal metrics will be included in the forthcoming classified NDIS implementation plan.

Table 1

Actions	Illustrative Outcomes/Outputs
Improve resilience by investing in extra capacity	Increase in DIB capacity
Manage inventory and stockpile planning	Increase in replenishment rate of critical systems in response to Ukraine
Collaborate with Congress on domestic production	Increase in acceptance of legislative proposals that solve challenges
Expand supplier base	Increase in number of suppliers newly doing business with the Department
Leverage data analytics to improve sub-tier visibility	Increase in number of bottlenecks identified with improved sub-tier visibility
Engage allies and partners in increasing supply chain resilience	Increase in number of purchases made through multilateral and bilateral agreements
Improve Foreign Military Sales (FMS) process	Increase in Foreign Military Sales (FMS)
Enhance industrial cybersecurity	Decrease in cybersecurity incidents targeting DIB members

2.1.4 Risks of Not Achieving

Inability to Meet the Pacing Challenge: Failing to seize the opportunity provided by our innovation hubs and U.S. and allied industrial bases creates risks for the United States and its ability to adapt to new and emerging threats. This includes strengthening and expanding the supplier base that largely consolidated after the Cold War.

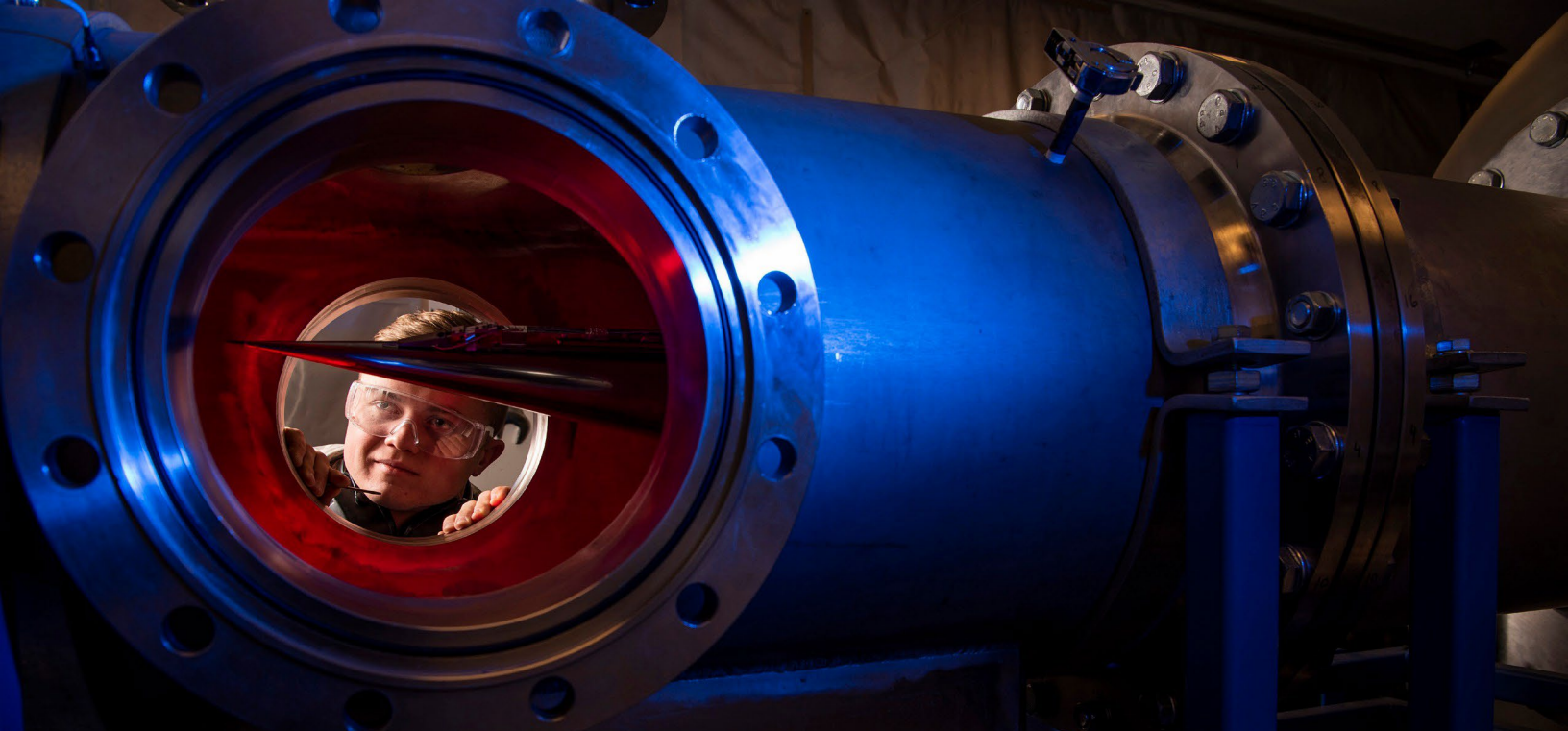
Supply and Materiel Shortfalls: If the Department fails to reach its industrial base goals, the United States and allies and partners will risk greater shortfalls in supply and materiel in future conflicts. These risks will manifest as the inability to produce at scale; to produce needed defense articles within relevant timeframes; and reduced defense industrial effects supporting Integrated Deterrence. The combination of these risks will have a direct adverse impact on our ability to guarantee our own security and that of our treaty partners and on the ability of partners to sustain or contribute.

Limited Spare Capacity: The risks of not investing in spare production capacity include being underprepared for future materiel requirements and continued loss of existing capacity as private companies are incentivized to seek optimal return on capital.

Fragile Supply Lines: In addition to greater economic costs, sub-tier suppliers can face additional challenges that prime contractors do not. “Just-in-time” delivery has created fragility in the production capabilities for many end items, making sub-tier suppliers especially vulnerable.



Workforce Readiness



2.2 Workforce Readiness





2.2.1 Summary

Priority Defined: A skilled and sufficiently staffed workforce.

Labor continues to be a major challenge for industry as baby boomers retire and younger generations generally show less interest in pursuing manufacturing careers or lack the science, technology, engineering, and math (STEM) skills needed for industrial work. The labor market lacks sufficient workers with the right skills to meet domestic production and sustainment demand. This directly affects military readiness. For example, labor shortages are a major reason why ship maintenance timelines routinely exceed their schedules. These shortages extend from skilled laborers to engineers and other STEM fields needed to drive innovation and capacity development. This will be a challenge as the United States invests in onshoring domestic production through initiatives such as the Creating Helpful Incentives to Produce Semiconductors (CHIPS) Act, the Bipartisan Infrastructure Law, and the Inflation Reduction Act.

By fostering workforce development programs, both academic and occupational, the DoD aims to work aggressively to renew interest in industrial jobs and maintain a well-trained and sufficiently staffed workforce to achieve our national defense goals. To improve forecasting, trend analysis, and the capture of best practices, the Department will engage our international partners to share workforce training and management lessons learned and identify opportunities for enhanced

partnerships to meet the industrial demand of a dynamic threat scenario. Over the coming months, the Department will also develop a framework that integrates the acquisition and sustainment workforce strategies, building a community of practice that delivers a ready and capable workforce needed to meet and address the challenges identified in this strategy. This will complement and enable the DIB workforce to ensure there are pathways and partnerships between these critical communities to implement the NDIS objectives.

ACTIONS to ACHIEVE WORKFORCE READINESS		
	Prepare workforce for future technological innovation	<ul style="list-style-type: none"> • Invest in upskilling and reskilling programs • Invest in advanced manufacturing workforce pipelines
	Continue targeting defense-critical skill sets in manufacturing and STEM	<ul style="list-style-type: none"> • Invest in defense-essential industrial skills • Continue leveraging the Manufacturing USA (MFG USA) network
	Increase access to apprenticeship and internship programs	<ul style="list-style-type: none"> • Prioritize continued investment in critical skill sets through apprenticeships and internships
	Destigmatize industrial careers	<ul style="list-style-type: none"> • Partner with high schools, colleges, and universities to challenge stigma associated with trade occupations • Promote and invest in partnerships with educational institutions to increase awareness of the value of industrial base careers

2.2.2 Actions

2.2.2.1 Prepare Workforce for Future Technological Innovation

Invest in Upskilling and Reskilling Programs: Upskilling or reskilling workers is especially important as manufacturing becomes more dynamic and technologically advanced. Providing employees with training opportunities to expand or develop advanced industrial skills and enhance their careers helps to rebalance critical skill levels to better meet industry needs, boost workplace productivity as new technologies are adopted, and improve low retention rates. In surveys, most CEOs who introduced workforce upskilling reported increased productivity and an overall improvement in retention.¹⁴

The Department will look for opportunities to assist companies with upskilling and reskilling workers to help better meet national security needs. By providing incentives to companies that do so, the Department can increase the number of enterprises that invest in employee education and thereby prepare them for future technological innovation.

¹⁴ Upskilling for Shared Prosperity – Insight Report. World Economic Forum and Price Waterhouse Coopers, January 2021. (Page 11)

Invest in Advanced Manufacturing Workforce Pipelines: The DoD's Manufacturing Innovation Institutes (MIIs) connect organizations and activities to promote affordable, rapid transition and delivery of new and emerging defense-essential technologies. The institutes' programs offer guidance, workforce development content, and education activities that increase workforce preparedness for advanced manufacturing occupations such as highly skilled technicians, skilled production workers, technical engineers, scientists, and laboratory personnel. In 2021, DoD MIIs benefited over 80,000 participants, including students, educators, and professionals across the nation.¹⁵ To reach more people, DoD will explore expanding investment in MIIs, including supporting public-private partnerships with colleges and universities, high schools, and large and small enterprises.

Submarine Industrial Base (SIB)

The characteristics of navy shipbuilding and sustainment impose unique workforce requirements on the industry, with its most acute defense-related workforce challenges tied to nuclear submarine production. The public and private shipbuilding and refitting yards have suffered from the same defense spending contraction as other defense producers and the broad decline in U.S.-based shipbuilding has reduced the overall market need for shipbuilding expertise.* As a result, the domestic shipbuilding industry is struggling to maintain an adequately sized and skilled workforce. These conditions are now being met head-on by the Department's aggressive plan to simultaneously modernize its nuclear-powered strategic ballistic missile and attack submarine fleets, spiking the requirement for workers skilled in most of the traditional submarine construction trades. This enterprise also requires unique skill sets and extensive training—such as nuclear welding—that is proving difficult to acquire outside of U.S. Navy programs. For example, the Navy ended Fiscal Year 2022 short 1,200 workers across its four public shipyards. Notably, there are only two shipyards capable of servicing nuclear systems—which have no civil counterpart—putting additional pressure on the workforce as they require rare but niche skills in their labor pool. The Executive Director for the Strategic Ballistic Missile Submarine Program Executive Office noted that over the next ten years, the SIB alone will need to hire nearly 100,000 trained workers at both primary construction yards and 17,000 people at vendors supporting across the SIB supply chain — a massive increase.**

* Shipbuilding History. *The Decline of U.S. Shipbuilding*. January 21, 2016. Accessed 28 August 2023.

** The Interagency Taskforce in Fulfillment of Executive Order 13086 noted some of these SIB deficiencies in its September 2018 report. A July 6, 2023 report issued by the Congressional Research Service titled "Navy Virginia (SSN-774) Class Attack Submarine Procurement: Background and Issues for Congress" provides an updated SIB view, noting its projected hiring needs.

2.2.2.2 Continue Targeting Defense-Critical Skill Sets in Manufacturing and STEM

The Department will continue to invest in institutions and programs that support workforce development to address current and forecasted skills gaps in defense-related manufacturing and STEM jobs — jobs representing the core human capital component of the DIB. Furthermore, as manufacturing innovations such as advanced fabrication and the Internet-of-Things take root and grow in importance, they will change the way we work. This places even greater—and accelerating—demand for employees with high tech skills. At the same time, however, workforce training pipelines have decreased as manufacturing has advanced, resulting in declining numbers and atrophying skills.

Invest in Defense-Essential Industrial Skills: The Department acknowledges that targeting critical skills in manufacturing and STEM cannot be a one-off approach. As a response to this, the National

¹⁵ Department of Defense Manufacturing Technology Program. *About the DoD Manufacturing Innovation Institutes*. Accessed 10 October 2023.

Imperative for Industrial Skills (NIIS) was established in Fiscal Year 2020 as an umbrella framework to help focus integrated efforts to partner with industry, other government stakeholders, and regional communities to attack the DoD's most pressing industrial workforce challenges. This growing initiative has an annual investment profile exceeding \$300 million and is well positioned to be the flagship workforce initiative underpinning this NDIS. The goals of this initiative are to:

- Promote prestige of manufacturing and related careers while inspiring the next generation;
- Accelerate workers into and through training/development pipelines, at appropriate scale and velocity; and
- Elevate U.S. manufacturing to world-leading status.

Investment and policy actions across these three operational objectives are systematically prioritized to address greatest need and produce highest returns for the DoD and the nation. By continuing to invest in the NIIS initiative and identifying opportunities to replicate successes, the DoD will continue to support worker development programs to meet the needs of the U.S. manufacturing and adjacent industrial sectors.

Continue Leveraging the Manufacturing USA (MFG USA) Network: The MFG USA Network is leading the way in developing the STEM workforce needed to grow the advanced manufacturing sector. The MFG USA institutes collaborate not only with major universities and private sector companies but also with community colleges, local nonprofits, education groups, state governments, and youth groups such as the Girl Scouts. Other DoD-sponsored programs for defense-related STEM and workforce development include Project MFG, photonics certification, the Innovation Driven Research/Education Ecosystem for Advanced Manufacturing for the Defense (IDREAM4D), Microelectronics Security Training Center (MEST Center), and Scalable Asymmetric Lifecycle Engagement (SCALE).

2.2.2.3 Increase Access to Apprenticeship and Internship Programs

Apprenticeship programs, including those that collaborate with federal facilities (e.g., Oak Ridge National Laboratory), ensure that workers learn high-demand skills through hands-on experience and training. Currently, the DoD has a variety of apprenticeships tailored toward naval warfare, army engineering, and fleet readiness. For example, the Naval Fleet Readiness Center Southwest Apprenticeship program provides on-the-job training combined with related instruction to develop highly skilled, Navy-oriented, U.S. Department of Labor-certified workers. Apprenticeships are offered from a high school level to a recent graduate level and represent an opportunity to gain the experience of working for the DoD.

The DoD will prioritize continued investment in critical skill sets through apprenticeships. By expanding engagement with industry, academia, and other private/public relationships, the DoD can boost workforce exposure to the DIB and ensure the workforce pipeline has the critical skill sets that are needed for today and the future. The DoD will also work with key interagency partners to identify and collaborate on existing and emerging programs, including with the Departments of Veterans Affairs, Education, and Commerce.

2.2.2.4 Destigmatize Industrial Careers

The DoD will continue to support programs that showcase opportunities in manufacturing and technology fields with local high schools, colleges, and universities, as we work to change the present stigma associated with being an industrial worker. Often people believe these jobs are

low-wage, low-skilled, monotonous, and dangerous, and that they are a poor alternative to non-industrial jobs. In fact, industrial jobs contribute directly to the national security mission while being interesting and providing stability and competitive wages. Promoting industrial careers early is important to confront negative stereotypes and increase visibility.

Educational institutions can address the stigma by showing youth what manufacturing looks like today. For example, AIM Photonics partners with Stonehill College and Bridgewater State University on the Advanced Manufacturing & Integrated Photonics Technician Certificate program. Recent classes placed 100 percent of their students in professional internships and jobs at top manufacturing and photonics companies. In collaboration with other Federal departments and agencies, the DoD will continue to promote and invest in partnerships with educational institutions to increase awareness of the value of manufacturing and industrial careers.

2.2.2.5 Expand the Industrial Workforce to Strengthen National Security:

The defense industrial base (DIB) requires a varied and innovative supplier network to maintain its competitive edge. Expanding the pipeline of skilled workers will enhance the resilience and readiness of the defense industrial base. Additionally, reentry groups and untapped labor pools remain underutilized resources that could provide vital skills and expertise. The Department can play a key role in workforce expansion efforts by supporting initiatives that help companies identify and train new talent to ensure an enduring, competitive industrial workforce.

2.2.2.6 Invest in DoD Research and Education Programs (REP) to Strengthen the Workforce Pipeline:

With a growing shortage of skilled workers, the DoD has increased investment in research and education programs that support national security priorities. In recent years, the Department allocated \$61.7 million to research institutions under the REP program. Secretary Austin emphasized that “to sharpen America’s technological edge and to strengthen America’s outstanding military, the Department is committed to investing more in research institutions that drive innovation.” The REP program aims to:

- Enhance research programs and capabilities in scientific and engineering disciplines critical to national security;
- Increase participation in DoD research programs across various academic institutions; and
- Expand the number of graduates in science, technology, engineering, and mathematics (STEM) fields relevant to the defense mission.

By continuing targeted investments in STEM education and research, the DoD can ensure a larger, highly skilled workforce that meets the evolving demands of the defense industrial base.

2.2.3 Illustrative Outcomes and Outputs

Table 2 presents the actions and corresponding illustrative outcomes or outputs to measure progress against the Workforce Readiness priority. Formal metrics will be included in the forthcoming classified NDIS implementation plan.

Table 2

Actions	Illustrative Outcomes/Outputs
Prepare workforce for future technological innovation	Reduction in labor shortages across DIB
Continue targeting defense-critical skill sets in manufacturing and STEM	Reduction in skills gaps in manufacturing and STEM
Increase access to apprenticeship and internship programs	Increase in apprenticeships and internships for high-school and college students to enter the DIB
Destigmatize industrial careers	Reduction in labor shortages in industrial careers

2.2.4 Risks of Not Achieving

There are several risks associated with failing to achieve Workforce Readiness:

Inability to Successfully Onshore Critical Manufacturing: One of the biggest challenges for onshoring manufacturing is the existing labor shortage. Without the necessary laborers, companies that return to the United States will not have the workforce needed to be sustainable. Workforce issues can also deter companies from returning to the United States in the first place.

Inability to Compete Globally: Without a skilled and sufficiently staffed workforce, the Department will be unable to compete globally. Our defense capabilities require a skilled workforce to produce goods, build and sustain systems, and conduct research and development.

Reduced Productivity throughout the Full Supply Chain: Without the necessary number of properly trained workers, companies will have trouble meeting their production goals. The inability to meet production goals, especially those important to the DIB, directly affects systems and products that are important to our national security.

Limited Innovation: A larger, more robust workforce ensures a varied set of ideas. This is paramount to building workforce readiness.

Flexible Acquisition



2.3 Flexible Acquisition

2.3.1 Summary








Priority Defined: Acquisition strategies that strive for dynamic capabilities while balancing efficiency, maintainability, customization and standardization in defense platforms and support systems. Flexible acquisition strategies would result in reduced development times, reduced costs, and increased scalability.

The Russian Federation's full-scale invasion of the Ukraine highlights how protracted attritional conflicts can rapidly deplete military resources. The DoD seeks to use a flexible acquisition approach to industrial planning where the DoD will strive to balance customization, production efficiency, and timing. Properly executed, flexible acquisition is crucial for scaling production swiftly and adjusting the production mix to achieve and maintain enduring advantage. A shift to flexibility will allow the DoD to optimize for dynamic production and capabilities that strengthen defense supply chains and bolster a modern industrial base.

Prioritizing flexible acquisition strategies addresses inappropriate customization, which occurs when product acquisition requirements are insufficiently defined. This is often associated with design changes that increase capability or overcome perceived design flaws. Other causes can include mission or technology creep during protracted development cycle times and underestimating the difficulty of change requests.

Delivering effective capabilities to the warfighter requires the development and maintenance of customized systems and platforms maintained by both the commercial sector and DoD's organic industrial base (OIB). Inappropriately customized systems have lower battlefield and operational utility and are more expensive and difficult to maintain. Therefore, the DoD seeks an appropriate level of customization that can balance efficiencies and speed of fielding from commercial off-the-shelf (COTS) capabilities with resilience, scale, and effectiveness through the life cycle of platforms. It also could contribute to better adaptation to emerging threats, protection against obsolescence of specific systems or parts, along with better logistics and maintenance capabilities.

Flexible Acquisition relates *strictly* to DoD aiming to acquire an intelligent, balanced mix of platforms and systems, together with the benefits that accrue. It is vital to establish that the term Flexible Acquisition does not directly call for broad-based acquisition reform, which, while there is a periodic need for it based on shifting exigencies, is beyond the scope of this strategy.

ACTIONS to ACHIEVE FLEXIBLE ACQUISITION		
	Broaden platform standards and interoperability	<ul style="list-style-type: none"> • Promote open architecture • Adoption of industry standards • Incentives and requirements for interoperability and exportability • Invest in research and development • Consider exportability during system design rather than post-production
	Strengthen requirements process to curb "scope creep"	<ul style="list-style-type: none"> • Implement policies aimed at advancing adaptive acquisition reforms • Incremental development and advanced virtual modeling methodologies
	Prioritize off-the-shelf acquisition where applicable and reasonable	<ul style="list-style-type: none"> • Embrace COTS solutions to drive positive impact on innovation, cost-effectiveness, and expansion of the supplier base
	Increase access to intellectual property (IP) and data rights to enhance acquisition and sustainment	<ul style="list-style-type: none"> • Use modular open systems approaches (MOSA) • Mitigate IP restrictions on proprietary components by negotiating specialized license agreements
	Consider greater use and policy reform of contracting strategies	<ul style="list-style-type: none"> • Work with Congress to modify contract authorities to align with present defense production priorities
	Continue to support acquisition reform	<ul style="list-style-type: none"> • Advance acquisition strategies that elevate the health of the industry to high priority • Employ flexible funding and procurement mechanisms • Orient acquisition policy for aggressive expansion of production capacity
	Update industrial mobilization authorities and planning to ensure preparedness	<ul style="list-style-type: none"> • Set up the legal and regulatory conditions today to ensure mobilization ability in the future

2.3.2 Actions

To mitigate the risks of unnecessary customization, the DoD seeks an intelligent balance between customization and standardization. Standardization is the process of developing and agreeing on (by consensus or decision) uniform engineering criteria for products, processes, practices, and methods for achieving compatibility, interoperability, interchangeability, or commonality of materiel.²⁰ Increasing standardization allows for economies of scale, streamlined production processes, and greater interoperability. It allows the DoD to use solutions and innovations being developed in commercial industry. Carefully managed customization addresses specific mission needs without compromising the broader efficiency and effectiveness of the defense sector. Striking this balance is essential for maintaining a strong, adaptable, and cost-effective defense industrial base that can supply the warfighter with mission-customized systems while mitigating downstream reliability, availability, and maintainability problems.

2.3.2.1 Broaden Platform Standards and Interoperability

Promote Open Architecture: The Department will continue to encourage the adoption of open architecture principles in the design and development of platforms. Open architecture allows components to be modular and interchangeable, making it easier to integrate new technologies and updates across different systems.

Deploy and Adopt Industry Standards: The Department will leverage existing industry standards where applicable, rather than operating in isolation and inventing new standards. Utilizing widely accepted industrial standards will facilitate and simplify integration and production efforts.

Incentivize Requirements for Interoperability and Exportability: DoD Instruction 5000.85 already requires interoperability and exportability considerations when making acquisition decisions. For future acquisitions and projects, it recommends that concise interoperability and exportability requirements be explicitly stated through the acquisition process. DoD will work with defense contractors to communicate the importance of interoperability requirements which could increase the breadth of systems that a contractor could work on, thereby opening more lines of business for individual contractors.

Invest in Research and Development: The Department will invest in research and development efforts that focus on enhancing interoperability among different platforms. This may involve advancements in communication technologies, data analytics, and artificial intelligence to improve coordination and decision-making.

Global Partners and Allies in Context: Standards, modularity, and interoperability are crucial elements that enable mutual support and collaboration within the global defense industrial base. These benefits include resource sharing, research, manufacturing, expertise exchange, technology transfer, and the development of common platforms. By working together effectively, we and our allies and partners can address capacity and capability gaps, enhance production capacity and capabilities, boost economic advantages, and reinforce alliances.²¹

²⁰ Department of Defense. Manual 4120.24: Defense Standardization Program (DSP) Procedures. 15 October 2018.

²¹ See also NDIS Section 2.1.2.6 "Engage Allies and Partners to Expand Global Defense Production and Increase Supply Chain Resilience" of NDIS 2.1 "Resilient Supply Chains"; and NDIS Section 2.4.2.2 "Participate in International Interoperability Standards-Setting Bodies"; and Section 2.4.2.3 "Fortify Alliances to Share Science and Technology" both of NDIS 2.4 "Economic Deterrence."

Small Business and Non-Traditional Suppliers in Context: Standards, modularity, and interoperability, as well as multi-year contracts, can also factor in helping small businesses and non-traditional suppliers work with DoD. They reduce barriers to entry by simplifying product development and integration, making it functionally easier and less expensive for these suppliers to participate and compete, and focus on niche areas of expertise and contributing innovations to the broader defense base. This benefits DoD by reducing the risk of lock-in to a single supplier by allowing small businesses to offer components or systems that can be integrated into larger defense systems, which by extension, and together with multi-year contracts, mitigate business execution risk.²²

Consider Exportability During System Design Rather than Post-Production: The Department will encourage the inclusion of exportability features during system design, rather than post-production. The war in Ukraine highlighted the need, not just for interoperability with allies and partners in conflict, but also the technical challenges, increased costs, and protracted timelines when considering exportability after the conclusion of the system development process.

2.3.2.2 Strengthen Requirements Process to Curb Scope Creep

Implement Policies Aimed at Advancing Adaptive Acquisition Reforms: The Department will rigorously implement DoD Instruction 5000.02: *Operation of the Adaptive Acquisition Framework*.²³ DoD Instruction 5000.02 was issued in June 2022 to ensure that requirements were defined and understood before a program is approved to start system development. It emphasizes the importance of well-defined and properly articulated requirements and the setting of clear milestones throughout the development process. This ensures that sufficient systems engineering analysis is conducted and resource trade-offs are made before the program enters the engineering and manufacturing phases of the Defense Acquisition System. DoD's current policy requires that appropriate trade-offs be made among cost, schedule, technical feasibility, and performance throughout the life of a program. These directives help ensure that the program stays focused and prevents unnecessary changes or additions that could lead to expanded capability requirements. This also covers appropriate change control processes, risk management, continuous review, and stakeholder engagement.

Incremental Development and Advanced Virtual Modeling Methodologies: The DoD will aggressively implement policies aimed at preventing “scope creep” — the gradual additions to capability requirements that change the scope of work in systems development which result in cost overruns and delayed delivery timelines. Adopting agile and advanced virtual development methodologies can help manage scope creep by breaking development into smaller, more manageable increments or with fewer physical prototypes and greater optimization. This allows for regular review and adaptation to changing requirements without affecting the overall project significantly.

Ultimately, success in preventing undesirable scope creep depends on the implementation of, and adherence to, guidance such as DoD Instruction 5000.02, as well as the ability of program managers and stakeholders to effectively manage changes while maintaining the project focus and objectives.

²² See also NDIS Section 2.1.2.3 “Continue and Expand Support for Domestic Production” subsections “Expand Relationships with Companies and Industries not Traditionally in the DIB” and “Deploy Innovative Funding Mechanisms to Revitalize the OIB” and NDIS Section 2.1.2.4 “Expand Supplier Base and Invest in New Production Methods” both of NDIS 2.1 “Resilient Supply Chains.”

²³ DoD Instruction 5000.02 *Operation of the Adaptive Acquisition Framework*. June 8, 2022.

2.3.2.3 Prioritize Off-the-Shelf Acquisition Where Applicable and Reasonable

The DoD must find the best capabilities to support the warfighter, including commercially available solutions. Commercial off-the-shelf (COTS) procurement brings significant benefit to DoD, including creation and integration of new technology; greater product availability and reliability; reduced acquisition cycle times; lower life cycle costs; increased competition, and an expanded pool of innovative and non-traditional contractors who seek to do business with DoD. While certain DoD requirements cannot be fulfilled by commercial item procurement, commercial solutions are a vital tool to achieve our national objectives.

The United States must seek commercial solutions and technologies from international allies and partners as well. Market research activities should include consideration of the global defense and commercial industry more broadly, factoring in solutions resident in ally and partner nations. The United States does not have a monopoly on innovation and new technologies. Many other national industrial bases have their own strengths and core competencies.

Positive Impact on Innovation and Cost-Effectiveness: The DoD will leverage the advantages of COTS solutions by carefully evaluating how COTS systems may be used on their own, or to augment current capabilities. Embracing COTS solutions can drive faster procurement cycles, as the products are already developed and tested for commercial use. This can translate to quicker access to new technologies and innovations. Additionally, COTS products are often more cost-effective compared to custom-built solutions, potentially reducing overall acquisition costs for the DoD. COTS products also tend to have fewer reliability, availability, and maintainability challenges as there is a market incentive to develop and maintain these products.

Expanded Supplier Base: Encouraging the use of COTS products can encourage new suppliers from the commercial sector to participate in defense procurement. This broadens the DIB by bringing in expertise and capabilities from various non-traditional industries, thereby fostering competition and reducing reliance on a limited set of traditional defense contractors. The DoD will review the potential for standalone utilization of COTS systems or augmentation of other bespoke capabilities using COTS systems. This will make maintenance easier and develop the modernized industrial base by introducing manufacturers and maintainers of COTS systems. The use of COTS systems ensures that new industrial partners have customers apart from the DoD for their commercial viability and can mitigate monopsony-like dynamics between the DoD and the traditional DIB.

2.3.2.4 Increase Access to Intellectual Property (IP) and Data Rights to Enhance Acquisition and Sustainment

The DoD will integrate IP planning fully into acquisition strategies and product support strategies to protect core DoD interests over the entire lifecycle and seek to acquire only those IP deliverables and license rights necessary to accomplish these strategies, bearing in mind the long-term effect on cost, competition, and affordability.

To proactively mitigate against IP-based restrictions on competition, DoD will look to use a modular open systems approach (MOSA) to manage proprietary components. MOSA combines system engineering open architecture techniques with open licensing and related legal and business considerations to isolate proprietary technology and prevent overleveraging of limited private investments from undermining return on government investment. MOSA enables the DoD to limit the impact of restrictions on privately developed components by treating those components as

proprietary “black boxes” that are described with releasable “form, fit, or function” data and well-defined and described interfaces to the remainder of the system components. This allows other vendors to identify suitable alternatives for the proprietary black boxes, or, if necessary to contract with the OEM for support for those black boxes, limit such sole-source efforts to the black box itself.

Alternatively, or in conjunction with MOSA, DoD will mitigate IP restrictions on proprietary components by negotiating specialized license agreements that better balance the Department’s and vendors’ interests. The Defense Federal Acquisition Regulation Supplement (DFARS) standard license rights or the vendor’s customary commercial license allows and encourages the parties to negotiate specialized license agreements for all data rights scenarios, including technical data and computer software for commercial and noncommercial products, for developmental and non-developmental technologies, or any combination of such characteristics. In all cases, the negotiation of any specialized license must occur through voluntary, mutual agreement of the parties.

Accordingly, the DoD has a compelling interest in entering into such negotiations as often as possible. DoD should leverage its market power and incentivize the vendors to enter into agreements that encourage the competitor to develop business models and provide corresponding offers that better balance both parties’ interests in ensuring return on their technology investments, while promoting and enhancing DoD options for increased competition throughout the lifecycle of the program.

2.3.2.5 Consider Greater Use and Policy Reform of Contracting Strategies

A flexible requirements process permits changes to allow for technological advances on multi-year development and procurement programs. However, this flexibility must be balanced against other risks such as complexity, transparency and accountability, cost overruns (if poorly managed), limited competition, and administrative overhead. It is important to note that priorities often shift and traditional contract policies and regulations often involve funding adjustments, competitive procurement principles, compliance, reporting, and oversight. These can and should be applied to mitigate risks but can be adapted to meet speed and agility priorities. For instance, the software acquisition pathway enables DoD to execute rapid and iterative delivery of software capabilities by using modern development practices combined with existing contracting authorities. The DoD will look to use greater FAR- and non-FAR-based contract types, as appropriate, and seek to ensure contracting authorities align with present defense priorities.

2.3.2.6 Continue to Support Acquisition Reform

Advance Acquisition Strategies That Elevate the Health of the Industry to High Priority: The Department will seek to ensure that acquisition approaches consider the health, capacity, and capability of the domestic manufacturing base. Therefore, the Department will pursue acquisition strategies that streamline the process and communicate a sustained and transparent “demand signal” to both domestic and international suppliers. A streamlined and clear acquisition process will enable more businesses to navigate their way into and through the DIB to promote competition. A strong and stable demand signal will allow defense contractors and sub-tier suppliers to make longer-term production and resource allocation commitments—including for capital investment and operating budgets, research and development, manufacturing capacity, procurement of materials, and workforce hiring. Predictable demand will also help mitigate the effects of regulations compliance, security clearances, and other administrative barriers.

DoD will broaden outreach to strengthen public-private partnerships,²⁴ dedicated funding or set-asides, risk-sharing mechanisms (such as “secure by design”) and expanded use of flexible contracting approaches. This will include providing greater support in navigating DoD’s acquisition processes and expanding the use of existing small business programs in non-traditional industry sectors, especially those programs with a history of success working with non-traditional suppliers and new entrants into the DIB.²⁵

Employ Flexible Funding and Procurement Mechanisms: The DoD will seek to expand the use of multi-year procurement (MYP) to create sustained demand signals that will promote investment into the capacity of the industrial base, which have typically been reserved for only the most expensive acquisition types, such as procurement of large sea-going Navy ships. MYPs are a step in building a consistent and predictable demand signal that creates more transparency and less risk for both prime contractors as well as more fragile sub-tier suppliers. For example, the FY23 National Defense Authorization Act (NDAA) extended MYPs to support the greatly increased demand for munitions and now includes many low-cost weapons.²⁶ OSD will also work with the Services to identify opportunities to propose MYPs in future budgets.

Orient Acquisition Policy for Aggressive Expansion of Production Capacity: The DoD’s acquisition process is a structured series of steps and activities used to acquire goods and services for the U.S. military. Typical peacetime acquisition reform tends to place more emphasis on greater efficiency, cost effectiveness, transparency, and accountability. Today’s threats, however, necessitate acquisition reform that includes efforts to revitalize the defense industrial base, and potentially, rapid expansion to prepare for pacing security challenges. This will require substantial changes to existing acquisition mechanisms. Correspondingly, there will need to be a change of acquisition mindset that includes increased flexibility and risk tolerances and embracing “fail fast” and similar concepts. Risk aversion must be replaced by aggressive, learning mindsets in both developing and fielding systems underpinned by strong commitments of accountability and responsibility. Crisis period acquisition policy reform tends to favor better resourced defense companies. As such, DoD will work to stimulate industry variation through focused policy directives to help small businesses navigate the complex defense acquisition process. DoD will work to reform acquisition policies that unnecessarily burden or restrain the nation from rapidly attaining a proper, robust defense production posture while simultaneously fostering supplier variation with a slate of programs referenced elsewhere in this strategy.²⁷

2.3.2.7 Update Industrial Mobilization Authorities and Planning to Ensure Preparedness

To be prepared for future crises, the DoD must have all available tools at hand. Mobilization authorities refer to the legal and regulatory mechanisms that enable the United States government

²⁴ Such as centers of excellence in manufacturing and innovation clusters or hubs in regions with a high concentration of non-traditional suppliers and research institutions.

²⁵ Such as the Mentor Protégé Program (MPP) and APEX Accelerators, which provide guidance to non-traditional entities and new entrants through mentorship and technical assistance, respectively.

²⁶ Pub L. 117:263. James M. Inhofe National Defense Authorization Act for Fiscal Year 2023. Signed into law on 12/23/2022. See sections 125, 811, and 815 for multi-year procurement authorities.

²⁷ Many of the areas ripe for acquisition reform come from the Section 809 Panel, formally known as the Section 809 Panel on Streamlining and Codifying Acquisition Regulations, which was a congressionally mandated advisory panel established in 2016 to review and provide recommendations for reforming DoD’s acquisition regulations. The panel touched on policy and process improvements in streamlining and simplifying regulations, modernizing acquisition methods (e.g., category management), reducing acquisition process costs, and advancing professional development for acquisition personnel.

to rapidly expand, reconfigure, and draw on the defense industrial base in times of national emergency or war. Mobilization planning outlines how the government will work with the defense private sector and how the government will operate the OIB during times of crisis to ensure the timely production and distribution of essential materials, equipment, and services to support national security objectives.

However, there is nothing rapid about mobilization; it is time and resource intensive. To best posture the government, industry, the Armed Services, and our allies and partners, we need to think now about the steps we can take today to set the conditions for potential mobilization in the future. The DoD needs to act now to set those conditions and consider mobilization requirements, and the associated authorities and plans, to successfully address the demands of the NDS.

2.3.3 Illustrative Outcomes and Outputs

Table 3 presents the actions and corresponding illustrative outcomes or outputs to measure progress against the Flexible Acquisition priority. Formal metrics will be included in the forthcoming classified NDIS implementation plan.

Table 3

Actions	Illustrative Outcomes/Outputs
Broaden platform standards and interoperability	Increase in adoption of open systems architectures across critical programs
Strengthen requirements process to curb scope creep	Increase in adoption of virtual modeling methodologies across critical programs
Prioritize off-the-shelf acquisition	Increase in Off-the-Shelf acquisition supporting critical programs
Increase access to IP and data rights to enhance acquisition and sustainment	Increase in retention of data rights and intellectual property acquisition
Consider greater use and policy reform of contracting strategies	Increase in range of contracting types and authorities used
Continue to support acquisition reform	Increase in draft legislation targeting defense acquisition reform
Update industrial mobilization authorities and planning to ensure preparedness	Increase in authorities enabling industrial mobilization

2.3.4 Risks of Not Achieving

Flexible acquisition planning will allow the DoD to work with a broader set of industry and balance the tension between the need for customization and adopting, where appropriate, industry standards. While some level of customization is necessary to meet specific mission requirements and stay ahead of potential adversaries, there are risks associated with excessive customization that hinder the development of a modern industrial base. Thus, COTS approaches versus

customized systems must be balanced to meet warfighter requirements at speed and scale. Failure to balance these risks strategically can significantly hinder the delivery of critical capabilities.

Limited Scale: Customized systems are often challenging to produce in large quantities. This limitation can hinder rapid production and deployment during times of conflict or crisis, making it difficult to scale up the production of critical equipment quickly.

High Costs and Lengthy Development Times: Complex warfighting requirements may drive highly customized material solutions. However, utilizing extensive customization to design tailored systems may have certain drawbacks. Extensive customization could lead to certain projects experiencing cost overruns and extended development times, which make it more challenging to respond to current warfighter requirements. Additionally, extensively customized systems require additional engineering, testing, and production efforts, along with building additional maintenance capacity through the lifetime of the system within both U.S. and allied defense industries. Therefore, in some cases, extensive customization may lead to protracted engineering, testing, and production efforts and timelines, significantly increased costs of platform and associated sustainment, strained defense budgets (in the aggregate), sub-optimal unit production, and reduced industrial and military readiness. These issues can hamper the military's ability to efficiently deploy cutting-edge equipment to the services.

Technology Obsolescence: Owing to rapid technological advancements, long development times associated with extensive customization can also lead to systems becoming outdated and obsolete before they are deployed at scale. This is particularly true in emerging technologies and software-enabled capabilities.

Diminished Industrial Base Resilience: Overly customized programs can also lead to a narrow industrial base with limited variation in production capabilities. This vulnerability can become a strategic risk if a supplier faces difficulties or disruptions, impacting the entire supply chain and readiness. Dissimilarity with non-defense commercial projects also leads to business incentives for suppliers to divest customized capabilities – leading to reliability, availability, and maintainability challenges for the military departments and the organic industrial base.

Sustainment and Logistics Challenges: Each customized system may require unique maintenance procedures, spare parts, and training for operators and maintenance personnel. This complexity can strain the logistics chain and increase the risk of operational disruptions due to supply chain problems.

Reduced Operational Effectiveness: Excessive customization can reduce interoperability. Crucially, a lack of interoperability can limit joint operations and reduce overall effectiveness. It can also restrict opportunities for the U.S. defense industry to access international markets and collaborate with allied nations, and vice versa.

Increased Technological Risk: Commercial off-the-shelf information technology (COTS IT) provides rapid access to relatively low-cost emerging technologies, particularly compared with some military solutions. However, COTS IT solutions may expose DoD systems and applications to increased risk due to insufficient integration-tested updates and modifications. The velocity of technological innovation requires vigilant monitoring, evaluation, and management across the spectrum of DoD applications.

A person wearing a high-visibility yellow and black striped safety vest is looking through a red, grid-like structure, possibly a window or a barrier. The background is dark and blurry, with some red and yellow light sources visible. The overall image has a high-contrast, somewhat abstract feel.

Economic Deterrence



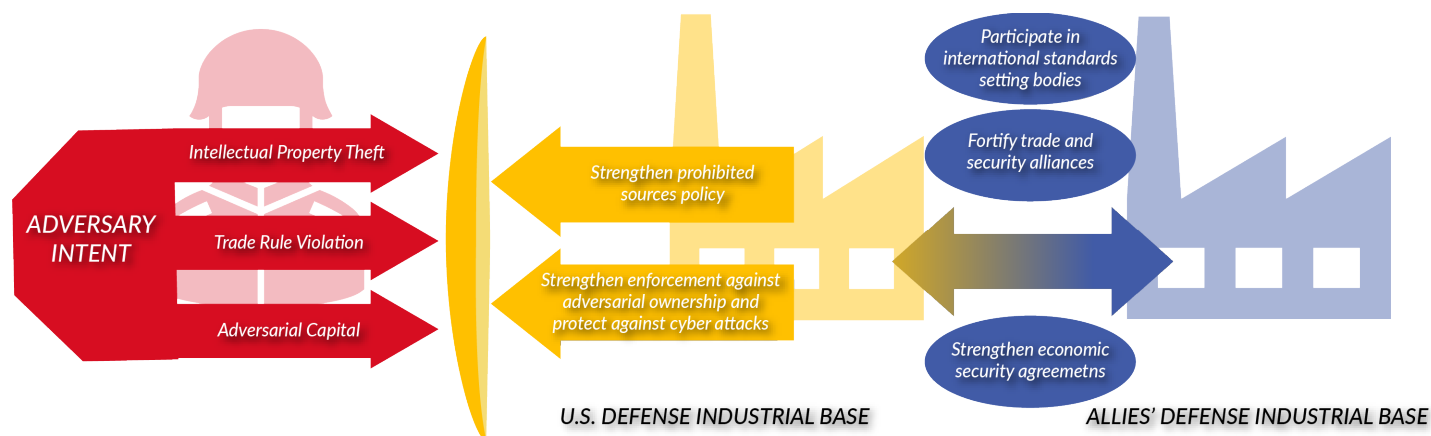
2.4 Economic Deterrence

2.4.1 Summary

Priority Defined: Fair and effective market mechanisms that support a resilient defense industrial base among the U.S. and close international allies and partners and contribute to economic security and integrated deterrence. Fear of materially reduced access to U.S. markets, technologies, and innovations sows doubt in the minds of potential aggressors.

After World War II, the United States and its allies adopted a global order based on fair trade and free markets enshrined in the General Agreement on Tariffs and Trade (GATT), the precursor to the World Trade Organization and European Union. Today, the PRC, the Russian Federation, and others are challenging this system, flouting international legal and trade standards. Since the 1980s, the PRC has run massive trade surpluses against the U.S. and our allies and partners. Initially this was the result of differences in labor costs, exchange rates, trade policies, and relative consumer demand, but increasingly because the PRC engages in a host of market distorting activities.²⁸ The sustained imbalance in trade weakened our domestic industries, displaced workers, hollowed out heavy industry, and contributed to the rapid increase in the U.S. national debt.

²⁸ Such means include currency manipulation (e.g., central bank intervention), export subsidies (e.g., tax incentives, grants, low-interest loans), state-owned enterprises (e.g., preferential treatment), intellectual property practices (e.g., lax enforcement), non-tariff barriers (e.g., restrictive standards, licensing requirements, complex customs procedures), export quotas (e.g., manipulation of rare earths markets and supply chains), protectionist industrial policies (e.g., government dominance directives), and exclusionary trade agreements (e.g., Belt and Road Initiative).



Illustrative Economic Deterrence between U.S. and Allies' defense industrial bases to repel adversarial intent

The DoD is deeply concerned about the PRC's domination of critical markets. Such domination allows it to control commodity pricing and access to materials in strategically critical areas, and to erode the health of the heavy industries that the defense sector historically leveraged. Meanwhile, the traditional DIB has been contracting and consolidating because of post-Cold War defense budget cuts.²⁹ Much of the civilian manufacturing sector and some of the defense sub-tier supply chain has moved offshore into a range of foreign producers, some of whom have become adversarial states. The DoD is also concerned that predatory adversarial investment and acquisition strategies, often focusing on critical or innovative technologies, further weaken U.S. industrial supply chains and the defense industrial base's ability to provide capabilities and secure sensitive technologies.

The compounding effects of unfair trade practices and predatory investments, combined with consolidation of certain defense markets, have significantly increased the risk and cost to U.S. and allied defense supply chains. The United States and our allies and partners now recognize that by continuing to adhere to the adversary-designed trade system with predatory and unfair practices without implementing appropriate safeguards, *we put ourselves at a disadvantage*.

Adversarial Capital

Below the level of armed conflict and in an era of strategic competition, adversarial nations are strategically employing investments in key U.S. and allied defense industries to harvest critical technologies, gain access to pioneering innovation and research and development efforts, leverage opaque private-public reporting structures to mask ultimate beneficial ownership (UBO), and capitalize on dual-use technologies that may be used to close the gap in the U.S. military's comparative advantage. While existing Committee on Foreign Investment in the United States (CFIUS) authorities as well as EOs for mergers and acquisitions, Team Telecom, ICTS, and Outbound Investment provide systemic measures against publicly disclosed investments transacted in the market, they do not provide full spectrum defense from targeted capital exploiting our open, free market economy. Private investment transactions in venture capital, private equity, real estate, greenfield investments, intellectual property acquisition and licensing, and debt markets, among others, are domains where adversarial capital threatens U.S. national security and economic interests without benefit of structural countermeasures.

²⁹ Congressional Research Service: *The U.S. Defense Industrial Base: Background and Issues for Congress*, October 13, 2023 (Pages 9-10)

The United States supports a rule-based international system that allows for the free flow of goods and materials and assures access to advanced technologies, expertise, and materials vital to our national defense. The DoD will seek to advance policies aimed at deterring and countering adversaries from using economic means to weaken U.S. national security. DoD policy will catalyze a modernized defense industrial base – both domestic and international – and vibrant defense-related supply chains with mechanisms to guard against unfair trade practices, pilfering by adversaries, and generally heightened global competition.

ACTIONS to RESTORE and ACHIEVE ECONOMIC DETERRENCE		
	Strengthen economic security agreements	<ul style="list-style-type: none">• Work with other federal executive departments to ensure the maintenance of economic and national security alliances
	Enable international interoperability standards through active participation in standards-setting bodies	<ul style="list-style-type: none">• Work in concert with the Department of State and the Department of Commerce to promote interoperability standards• Participate in standards setting-bodies, leading the development of international standards that facilitate interoperability
	Fortify alliances to share science and technology	<ul style="list-style-type: none">• Work with other federal executive departments, and with Congress to foster existing alliances and generate new mechanisms for sharing technologies and applications of scientific knowledge with other partners and allies
	Strengthen enforcement against adversarial ownership and cyber attacks	<ul style="list-style-type: none">• Work with other federal executive departments to protect U.S. assets from ownership by commercial entities controlled by adversarial nations• Work with other federal executive departments to protect U.S. assets from cyber-attacks against entities involved in the maintenance of our national defense
	Strengthen prohibited sources policy	<ul style="list-style-type: none">• Work to ensure that the materiel required for national defense is not sourced from adversarial entities

2.4.2 Actions

Optimizing for dynamic production and capabilities requires intentional actions aimed at promoting economic security and bolstering economic deterrence. To mitigate the impacts of trade and predatory investment practices in defense supply chains and innovative technologies, the DoD will also seek to partner more closely with allied nations with complementary resources and capabilities. These actions will contribute to building more dynamic production and capabilities and bolster a modernized defense industrial base.

2.4.2.1 Strengthen Economic Security Agreements

The DoD should focus on leveraging existing bilateral and multilateral relationships, such as NATO, AUKUS, and the NTIB, and focus on sourcing from countries that are geopolitical allies (“friend-

shoring”) to reduce reliance on potentially adversarial or unstable nations for critical defense and strategic materials. This will assist in mitigating the risk of supply chain disruption due to trade disputes, embargoes, or political tensions. This would also strengthen international security, economic collaboration, and soft power.

The United States has a complex web of friend-shoring-suitable alliances and partnerships around the world; a partial list includes Australia, Canada, the European Union, India, Israel, Japan, Mexico, South Korea, Taiwan, and the United Kingdom. The choice of which nations to continue or expand friend-shoring, defense-related sourcing from is predicated on a multitude of factors including history, shared values, public and political support, as well as security assurance, supply-chain resilience, risk divergence, industrial capabilities, technological capabilities, and – not least – strategic goals, economic impact, and cost considerations. The DoD must work with other federal agencies to ensure continued access to key markets and source materials while reducing geopolitical risks.

2.4.2.2 Enable International Interoperability Standards through Active Participation in Standards Setting Bodies

The DoD, in collaboration with other federal agencies including the Departments of State and Commerce, will implement standards and interoperability programs as a form of economic and collective security-based systems integration. This emphasizes systems interoperability between U.S. forces and those of our allies and partners. Integration will make systems modular, upgradable, and maintainable by vendors and entities other than the original manufacturer.

Interoperability among allies and partners also increases FMS opportunities, which further supports the defense industrial base. As part of this effort, the DoD will participate in bodies that set standards that can facilitate interoperability. Standards and interoperability programs will also enable fair and effective market practices with trading partners. Standardization will also support rapid industrial mobilization by enabling surge, expansion, or conversion at times of need. NATO standards provide an excellent example of international standards and interoperability programs, which have proven their value in shifting munitions inventories to support Ukraine in resisting the Russian Federation’s aggression.

2.4.2.3 Fortify Alliances to Share Science and Technology

The DoD will work with other federal agencies, including the Departments of State and Commerce, to enhance existing alliances and generate new and emphasize existing mechanisms for sharing technologies and applications of scientific knowledge with other partners and allies. Science- and technology-sharing agreements are necessary to build the trade and security alliances that are critical for achieving economic security. For that reason, the Department has developed an extensive structure with a variety of agreements and mechanisms to enable Research, Development, Test, and Evaluation (RDT&E) with international partners, from basic information sharing to complex cooperative activities.

These include joint programs with allies and partners to nurture and retain technological superiority. Such institutional integration is a deeper form of integrated deterrence cooperation requiring higher levels of trust, as it involves incorporating allies and partners into DoD decision-making processes. Working collaboratively with its interagency partners and Congress, the DoD can ensure the controlled dissemination of scientific knowledge and technological products and

promote interoperability and exportability. Controlled dissemination would strengthen the United States and its allies and partners, promote integrated deterrence of aggression by adversarial entities, and support the dynamic capabilities for a modernized defense industrial -.

2.4.2.4 Strengthen Enforcement Against Adversarial Ownership and Protect Against Cyber Attacks

The mitigation of threats arising from foreign transactions must be balanced against the openness of the U.S. economy to foreign ideas, talent, and capital. The DoD must work with other federal executive departments to protect U.S. assets from ownership by commercial entities controlled or influenced by adversarial nations, and from cyber-attacks against entities involved in the maintenance of our national defense. The United States has five authorities/agencies for monitoring potential adversarial ownership and control: Export Administration Regulations (EAR), International Traffic in Arms Regulations (ITAR), Team Telecom, CFIUS, and the Office of Information and Communications Technology and Services (OICTS). Close cooperation with interagency partners can ensure that the DoD can provide nuanced reviews of foreign transactions while carefully limiting foreign involvement. Moreover, as close allies also work to address the challenge of adversarial ownership and predatory investment practices, the DoD can begin collaboration in support of their efforts to protect their own and shared supply chains.

The DoD must also educate industry on the threats posed by foreign capital, adversarial ownership, and cyber-attacks and help them to prepare to deter, mitigate, and deflect such threats by improving defenses and lowering risk profiles. DoD supports companies, manufacturers, institutions, and organizations with a comprehensive, cost-effective resource for cybersecurity and foreign ownership, control, and influence (FOCI) information,³⁰ tools, and training at no-cost to the participant. At present, this is done via DoD's Project Spectrum, whose mission is to improve readiness, resiliency, and compliance for small manufacturers, the traditional DIB, the federal manufacturing supply chain, and the industrial sector. This provides supply chain visibility and compliance standards assurance while delivering the industrial cybersecurity resources and techniques that small- and medium-sized businesses need. Furthermore, the Department will coordinate with interagency partners to support industry in identifying, protecting, detecting, responding, and recovering from cyberattacks.

2.4.2.5 Strengthen Prohibited Sources Policy

Dependence on adversarial sourcing poses a mounting national security challenge to the DIB and the components, systems, platforms, and munitions it produces. Counterfeit or substandard items could foster system failures while computing and networking technology “backdoors” may serve as intelligence pathways. Further, even if materials and parts are uncompromised, sole-source dependence on adversary-produced materials and parts present an obvious vulnerability. Various investigations have confirmed adversarial infiltration into defense supply chains is substantial. Some critical capabilities remain dependent on prohibited adversarial suppliers.

Over the last decade, the DoD has struggled to curtail adversarial sourcing and burnish the integrity of defense supply chains. Despite these efforts, dependence on adversarial sources of supply has grown. DoD continues to lack a comprehensive effort for mitigating supply chain risk.

³⁰ Underlying these resources are DOD and collaborating agencies' data aggregation and advanced analytics efforts to expose the magnitude and concentration of adversarial capital targeting critical technologies and defense sector domains, making it possible to track and take measures to mitigate the threat adversarial capital and similar threats constitute.

Policy concerning prohibited sources today remains piecemeal, inadequate to address the current complexity of the DoD supply chain, and is often difficult to execute and enforce. Predictably, this approach has delivered only marginal results with DoD continuing to procure items from adversarial sources in line with low-cost free market principles but not in line with national security and resilience-oriented principles.

As detailed in the National Security Strategy and NDS, the PRC is the United States’ pacing challenge. DoD must work with Congress, other executive departments, and global Allies and partners to eliminate defense industrial dependencies emanating from the PRC. *The defense of the nation must not be held at risk by reliance on those who might seek to undermine it.*

2.4.3 Illustrative Outcomes and Outputs

Table 4 presents the actions and corresponding illustrative outcomes or outputs to measure progress against the Economic Deterrence priority. Formal metrics will be included in the forthcoming classified NDIS implementation plan.

Table 4

Actions	Illustrative Outcomes/Outputs
Strengthen economic security agreements	Increase in bilateral and multilateral economic agreements
Participate in international interoperability standards-setting	Increase in participation in interoperability standards-setting
Fortify alliances to share science and technology	Increase in new alliances and updates to existing alliances to share science and technology
Limit adversarial ownership and cyber attacks	Increase in enforcement against adversarial ownership
Strengthen prohibited sources policy	Reduction in amounts of source material and products in the DIB being sourced from adversarial entities

2.4.4 Risks of Not Achieving

DoD actions that support Economic Deterrence will bolster dynamic production and capabilities by focusing on national security and resilience-oriented principles where economic, technological, and defense priorities intersect. While the U.S. remains committed to fair, effective market mechanisms, building safeguards that protect a modernized defense industrial base remain necessary.

Critical Economic, Supply Chain, and Infrastructure Vulnerabilities: Trading practices in violation of international rules by rivals can lead to significant economic imbalances, such as trade deficits, lost business when competing against subsidized products, loss of market access for U.S. companies, and job losses. Disproportionate influence over strategic sectors by adversaries could compromise critical infrastructure or supply chain access to critical defense-related components and technologies.

Increased Costs and Reduced Defense Budgets: Lack of competition can lead to fewer incentives and less pressure for defense contractors to offer fair pricing and to control costs and gain efficiencies. These anti-competitive practices increase the potential for unchecked costs and harm sub-tier suppliers due to market consolidation. They could discourage new entrants into the defense industry and reduce the level of talent and expertise available to the DoD. Furthermore, failure to strengthen trade and technology-sharing agreements with allies and partners forces the United States to bear a greater proportion of the research and development costs of cutting-edge defense-related goods. Finally, anti-competitive behavior and market consolidation driven in large part by integration challenges and adversarial actions may weaken the U.S. economy, leading to potential budget constraints for defense spending. This could limit the DoD's ability to invest in modernization, research, and development while also reducing ally and partner capability.

Weakened Industrial Base: The overall health and viability of the defense industrial base could be affected by anti-competitive behavior, market consolidation, and adversarial trading practices. A less competitive DIB could limit options for the DoD. Without strong trade agreements, U.S. defense companies could face barriers to accessing foreign markets, potentially missing out on significant revenue opportunities, and losing economies of scale that come with broader international sales.

Intellectual Property (IP) Theft and Adversarial Capital IP Control: Failure to tighten policies, systems, and enforcement against adversarial capital and other hostile behavior may allow foreign entities to use their influence in U.S. companies to gain unauthorized access to valuable trade secrets and technologies. This could harm the competitive edge of the United States in key industries and negatively impact economic growth, job creation, and overall prosperity. If adversaries steal intellectual property and disregard IP rights, the United States may lose its technological edge in key defense areas.

Degraded Technology Edge, Innovation, and Quality: Trade agreements often facilitate the flow of ideas, technologies, and innovations between countries. The United States puts that fertile interchange at risk if it adopts protectionist policies that exclude its allies and partners. Failure to pursue economic deterrence—including collaborating on research and development, and securing the acquisition of cutting-edge military technologies, and leveraging the strengths and expertise of allies—could hinder scientific breakthroughs, innovation, and technological advancement. Failure to promote competition, especially at home, could also lead to slower technological advancements, quality issues, and even the loss of our technological edge in key areas.

Loss of Trust and Reputation: If the United States appears unable or unwilling to protect its critical industries and assets from adversarial influence, it could lose the trust of international partners and investors, impacting foreign direct investment and economic partnerships. Furthermore, if the United States fails to engage in cooperative science- and technology-sharing with its allies and partners, it risks alienating them. This isolation could lead to strained diplomatic relations, decreased trust, loss of foreign defense sales to competitors (perhaps including adversaries), and possibly even weakened economic ties, rendering deterrence of aggressive behavior by adversarial nations more difficult.



3 Assessment and Reporting

The NDIS aims to provide a vision and strategic framework for how the DoD will foster and drive dynamic production, and build and support a modernized industrial base over the next three to five years. Routine and rigorous assessment of progress toward these priorities will be critical for maintaining focus on them. Each priority is complex and many overlap and have interdependencies with other priorities. Furthermore, our priorities are long-term, perhaps requiring a generation of effort to achieve the desired effects. Because of this, it can be difficult to directly measure the outcomes and given the horizon for achieving our priorities, intermediate measures of success for the near-term actions over the next three to five years will be necessary to track progress toward the long-term goals and to inform updates to the NDIS.³¹

The assessment framework for the NDIS is built on the strategic framework beginning with each of the priorities. To track progress for longer-term objectives, intermediate measures will be developed to align with specific actions or objectives within each priority. These intermediate measures will then be linked to the specific means used to meet the objectives and overarching longer-term goal. Illustrative outcomes and outputs are shown in Tables 1, 2, 3, and 4 for each of the priorities and align to specific actions to gain insight into progress on meeting strategic goals. Detailed development of this assessment framework will be developed as part of the classified NDIS implementation plan.

The assessment tools that will be built to measure progress will also provide invaluable data to inform other strategies, such as the NDS. This strategy, and its associated metrics in the forthcoming classified NDIS implementation plan, will also support inputs to various reports on, and related to, the industrial base. The Department will coordinate across the government to minimize the data calls to industry when developing final metrics and measuring progress against them.

³¹ In many cases the data needed to measure this progress is not adequately collected, managed, or analyzed to develop meaningful measures of the industrial base and its resilience. To leverage the necessary data to measure progress toward the priorities—as well as to identify industrial-base vulnerabilities to mitigate and opportunities to pursue—it is critical to establish a data analysis capability devoted to industrial base analysis. This effort has already begun, initially relying upon a data call issued in February 2023 by the Deputy Secretary of Defense. The data call sought specific supply-chain data for 110 weapons systems in production and the data is organized into a network of DIB suppliers to understand critical characteristics of the DIB.



4 Conclusion

The United States and its allies and partners require modernized defense industrial capacity that strengthens national defense, and that reassures and supports those countries in the direct path of adversarial influence and aggression. This position of modern industrial strength is a core enduring advantage that will contribute substantially to Integrated Deterrence—not just for the Department but across the U.S. government and with allies and partners.

The NDIS addresses that imperative to mitigate and remedy critical vulnerabilities with intentional action, guided by a strategic vision and framework for how to revitalize, modernize, and expand the DIB. The actions proposed by this strategy lay out the generational changes needed to catalyze a modernized defense industrial base. This will require real and meaningful cooperation and participation of new domestic and international entrants into the defense industrial fold. We must transform our DIB into a robust, resilient, fully capable 21st century defense industrial base.

As we execute the provisions of this strategy, we will remain mindful of—and overcome—the real impediments to our success. Within the Department, we will establish the conditions for success including by promoting appropriate, consistent, and predictable funding where possible. Additionally, the Department will improve information integration, workforce training and adequacy, and address manufacturing capacity and economic threats to supply chains.

The nation needs to rally to the common defense. This NDIS is a call to both the public and private sectors for focused, dedicated efforts to build and secure the industrial capability and capacity necessary to ensure our military has the materiel available to deter our potential adversaries, and if necessary, defeat them in battle. This call to action may seem a great cost, but the consequences of inaction or failure are far greater.

5 Glossary of Terms

Advanced Manufacturing Automation — The integration of advanced technologies, systems, and processes to enhance productivity, reduce unit costs, improve product quality and reproducibility, and respond more effectively to market demands.. Advanced manufacturing automation stands at the intersection of robotics, additive manufacturing, data analytics (both forensic and predictive), machine learning, sensors, modeling, and simulation (e.g., “digital twins”), and other cutting-edge technologies.

AM Forward — Additive Manufacturing Forward, a program launched by President Biden on May 6, 2022, which is designed to help lower costs for American families by improving the competitiveness of America’s small-and-medium-sized manufacturers, creating, and sustaining high-paying manufacturing jobs, and improving supply chain resilience through adoption of additive manufacturing otherwise known as 3D printing.

APEX Accelerator — A (A&S) program that focuses on building strong, sustainable, and resilient U.S. supply chains by assisting a wide range of businesses that pursue and perform under contracts with the DoD, other federal agencies, state and local governments and with government prime contractors. It was formerly known as the Procurement Technical Assistance Program, authorized by Congress in 1985 to expand the number of businesses capable of participating in government contracts.

AUKUS — An enhanced trilateral security partnership created by the leaders of Australia, the United Kingdom, and the United States in September 2021.

Bipartisan Infrastructure Act — The Infrastructure Investment and Jobs Act of 2021.

CFIUS — Acronym for Committee on Foreign Investment in the United States, an interagency committee authorized to review certain transactions involving foreign investment in the United States and certain real estate transactions by foreign persons, to determine the effect of such transactions on the national security of the United States. Those transactions are also called CFIUS Covered Transactions.

CHIPS Act — The Creating Helpful Incentives to Produce Semiconductors (CHIPS) and Science Act of 2022.

Commercial-off-the-Shelf (COTS) — A commercial item sold in substantial quantities in the commercial marketplace and offered to the government under a contract or subcontract at any tier, without modification, in the same form in which it was sold in the marketplace. This definition does not include bulk cargo such as agricultural products or petroleum.

Data Rights — “Data Rights” refers to the Government’s license rights in two major categories of valuable intellectual property (e.g., technical data & computer software). The Federal Acquisition Regulations (FAR) prescribe policies, procedures and clauses pertaining to data rights for civilian agencies and the Defense Federal Acquisition Regulation Supplement (DFARS) for DoD.

Defense Innovation Board — A body established in 2016 under the Federal Advisory Committee Act, the Defense Innovation Board provides independent recommendations to the Secretary of Defense and other senior DoD leaders on emerging technologies and innovative approaches that DoD should adopt to ensure U.S. technological and military dominance.

Defense Innovation Unit — A DoD organization with offices in Silicon Valley, Boston, Austin, Chicago, and the Pentagon focused exclusively on fielding and scaling commercial technology across the U.S. military at commercial speeds.

Defense Production Act — The Defense Production Act of 1950 along with its amendments. Title I of this Act authorizes the President to require acceptance and priority performance of contracts or orders and to allocate materials, services, and facilities to promote the national defense or to maximize domestic energy supplies. Title III of the DPA provides various financial measures, such as loans, loan guarantees, purchases, and purchase commitments, to improve, expand, and maintain commercial domestic production capabilities needed to support national defense and homeland security procurement requirements. Title III also authorizes Federal Government procurement and installation of equipment in plants, factories, and other industrial facilities owned by the Government or private persons. Title VII of the DPA authorizes the President to consult with representatives of industry, business, financing, agriculture, labor, and other interests to provide for development of voluntary agreements and plans of action to help provide for the national defense. A voluntary agreement is an association of private interests, approved by the Government to plan and coordinate actions in support of the national defense.

Defense Standardization Program — A comprehensive, integrated standardization program linking DoD acquisition, operational, sustainment, and related military and civil communities established in on July 1, 1952, through the passage of the Cataloging and Standardization Act of 1952.

DFARS — Acronym for Defense Federal Acquisition Regulation Supplement, a supplement to the FAR specifically tailored for the DoD. It contains additional regulations and policies that apply to defense acquisitions. DFARS addresses unique requirements, such as cybersecurity, defense-specific clauses, and compliance with international agreements. See also FAR.

DIB — Acronym for defense industrial base, the domestic DIB includes public-sector (government-owned, government-operated) facilities, academic institutions, and private-sector (commercial) companies located in the United States. The global DIB includes foreign-owned companies and commodities sourced from countries with which the United States maintains formal defense cooperation partnerships, as well as foreign-owned companies and commodities sourced from countries without formal defense cooperation relationships with the United States. Together, the domestic DIB and portions of the global DIB form the National Technology and Industrial Base (NTIB), as established by 10 U.S.C. § 4801.

EAR — Acronym for Export Administration Regulations, issued by the Department of Commerce, which control the export of dual-use items (items that have both commercial and military or proliferation applications), less sensitive military items, and purely commercial products or commercial services. These items include commodities, software, and technology. Many items subject to the EAR are set forth by Export Control Classification Number on the Commerce Control List.

FAR — Acronym for Federal Acquisition Regulation, a set of regulations governing federal procurement policies and procedures. It provides guidance on how federal agencies, including the DoD, should acquire goods and services. Compliance with FAR is essential for ensuring transparency, competition, and fairness in the procurement process.

FMS — Acronym for Foreign Military Sales, that portion of United States security assistance for sales programs that require agreements/contracts between the United States Government and an authorized recipient government or international organization for defense articles and services to be provided to the recipient for current stocks or new procurements under Department of Defense-managed contracts, regardless of the source of financing.

Friend-Shoring — Similar to the concept of “on-shoring,” friend-shoring is a process that engages allies and partners in production and processing of critical and strategic materials and supplies.

FYDP — Acronym for Future Years Defense Program, it is a five-year budget projection that is derived from the POM. It provides a detailed breakdown of planned defense spending over the next five years. The FYDP is a critical planning tool that helps the DoD and Congress understand the long-term financial commitments required for defense programs. See also LLP.

GAO — Acronym for the Government Accountability Office, an organization that provides Congress, the heads of executive agencies, and the public with timely, fact-based, non-partisan information that can be used to improve government and save taxpayer dollars. Their reports are produced at the request of congressional committees or subcommittees or are in response to statutory requirements by public laws or committee reports.

GATT — Acronym for General Agreement on Tariffs and Trade, a legal agreement that aimed “substantial reduction of tariffs and other trade barriers and the elimination of preferences, on a reciprocal and mutually advantageous basis,” so that the economic recovery after World War II can be boosted. It now has been succeeded by the World Trade Organization (WTO), but the original GATT charter signed in 1947 still remains the basic set of free trade obligations on members of the WTO.

Global War on Terror — This includes the post-September 11 wars in Afghanistan and Iraq and describes diplomatic, financial, and other actions taken to deny financing or safe harbor to terrorists.

GOGO/GOCO — Acronym for Government Owned Government Operated/Government Owned Contractor Operated production facilities which make up the organic industrial base. See also Organic Industrial Base.

HIMARS — Acronym for the M142 High Mobility Artillery Rocket System, a full-spectrum, combat-proven, all-weather, 24/7, lethal and responsive, wheeled precision strike weapons system. HIMARS is designed to support joint early and forced entry expeditionary operations with high-volume destructive, suppressive, and counter-battery fires. HIMARS can achieve ranges of 70-plus kilometers, attacking the target with low-collateral damage, enabling danger-close fires (within 200 meters) in support of friendly troops in contact, as well as engaging high-value point targets in open, urban, and contested conditions.

IBAS -- Industrial Base Analysis and Sustainment, a DoD program that seeks to maintain or improve the health of essential parts of the defense industry by addressing critical capability shortfalls in the base, specifically capabilities that are critical to multiple military departments or DOD components and are at risk of being lost. IBAS primarily invested in projects to preserve existing suppliers and capabilities. These projects focused on maintaining workforce capabilities such as engineers at a supplier's production facility whose specialized skills were at risk of atrophying due to a reduction in DOD's demand.

IDREAM4D — Acronym for Innovation Driven Research/Education Ecosystem for Advanced Manufacturing for the Defense, a consortium whose focus is through a collaborative effort, to conduct impactful research for defense innovations and to prepare engineers and scientists who lead U.S. defense manufacturing innovation. The consortium is composed of five higher education institutions (UTRGV, UT Austin, UTSA, Virginia Tech, VSU), national research centers, national labs, defense manufacturers, local high school districts, and community colleges. The goal is to promote advanced additive manufacturing (AM) and smart manufacturing (SM) and to support innovations for the defense industries.

Integrated Deterrence — As defined in the National Defense Strategy, integrated deterrence is the Department's approach to aligning the Department's policies, investments, and activities to sustain and strengthen deterrence – tailored to the specific competitors and coordinated to maximum effect inside and outside the Department.

Internet-of-Things — The set of Internet-capable devices, such as wearable fitness devices and smartphones, which interact with the physical space and typically contain elements for sensing, communicating, processing, and actuating.

Interoperability — Interoperability is a requirement that a program's system interact with other systems through transport of information, energy, or matter.

ITAR — Acronym for International Traffic in Arms Regulation, a regulation issued by the Department of State to control the export of defense-related articles and services, including technical data, ensuring compliance with the Arms Export Control Act (22 U.S.C. 2751 et seq.). The United States Munitions List (USML) identifies defense articles, services, and related technical data that are inherently military in character and could, if exported, jeopardize national security or foreign policy interests of the United States.

JPAC — Acronym for Joint Production Acceleration Cell, established within the Office of the Under Secretary of Defense for Acquisition & Sustainment (OUSD(A&S)). The JPAC is charged with building enduring industrial production capacity, resiliency, and surge capability for key defense weapon systems and supplies. It is an institutionalization and restructure of the Munitions Industrial Deep Dive from a crisis-management, reactive team to one that proactively and continuously analyzes and identifies opportunities to optimize production capacity, resiliency, and surge ability. See MIDD.

Last Supper of 1993 — A dinner hosted by Secretary of Defense in the fall of 1993 attended by executives of major defense contractors in which the Secretary indicated that Pentagon budget cuts would endanger some of the combat jet firms, missile makers, satellite builders and other contractors. It is considered to have set off market consolidation within the U.S. defense sector.

Just-in-Time — An inventory management strategy that aligns raw material orders with production schedules. This “pull” system is driven by actual demand. The strategy reduces stock inventories but leaves no room for schedule error. As much a managerial philosophy as it is an inventory system.

LLP — Acronym for Large-Lot Procurement, a new contract and financing strategy outlined in the FY 2024 President’s Budget. The amount budgeted in the FY 2024 President’s Budget for the LLP throughout the Future Year Defense Program (FYDP) totals approximately \$15.1 billion and represents a commitment by the Department to address munitions requirements and implement decisive acquisition reforms.

ManTech — Office of Secretary of Defense Manufacturing Technology (OSD ManTech). The Defense-wide Manufacturing Science and Technology program consists of manufacturing institutes and a technology investment portfolio.

MEST Center— Acronym for Micro-Electronics Security Training Center, a collaboration between the University of Florida and Ohio State University establishing a system of training modules to suit the cybersecurity workforce needs of both Government and industry employees with a strong emphasis on hands-on learning.

MFG USA — Acronym for Manufacturing USA, a network of 17 institutes which are public-private partnerships that each have a distinct technology focus but work toward a common goal: to secure the future of U.S. manufacturing through innovation, education, and collaboration.

MII — Acronym for Manufacturing Innovation Institutes, an initiative that seeks to revitalize the U.S.’s domestic manufacturing capability through domestic public-private partnerships that enhance America’s strategic competitiveness while enabling the military of tomorrow primarily through three activities: one, advancing research and development (R&D) to promote American innovation while modernizing our military capabilities, two, growing manufacturing systems to enhance the Nation’s competitiveness, and three, furthering education and workforce development to train Americans of all ages and backgrounds for the jobs of the future. See also REP.

MIDD — Acronym for Munitions Industrial Base Deep Dive, a review process to assess, understand, and address challenges associated with ramping up production to backfill items transferred to Ukraine. This holistic review proposed to address not only short-term constraints but also identify challenges as part of the initial design of future weapon systems and acquisition strategies. It has now been institutionalized as part of the JPAC. See also JPAC.

Monopsony (Monopsonist) — A market condition where there is only one buyer. A monopsonist is the single buyer of a product or service from multiple sellers.

MOSA — Acronym for Modular Open Systems Approach, a technical and business strategy for designing an affordable and adaptable system. A MOSA is the DoD preferred method for implementation of open systems, and it is required by United States law.

MYP — Acronym for Multi-Year Procurement, a method of purchasing up to five years of requirements in one contract, which is funded annually as appropriations permit. If it is necessary to cancel the remaining quantities in any year, the contractor is paid an agreed-upon portion of the unamortized non-recurring start-up costs. High-dollar value MYPs must be specifically approved by Congress.

NATO — Acronym for North Atlantic Treaty Organization, an alliance of 31 countries from Europe and North America that exists to protect the people and territory of its members. The Alliance is founded on the principle of collective defense.

NDS — National Defense Strategy, a DoD document that sets forth how the U.S. military and security community will meet growing threats to vital U.S. national security interests and to a stable and open international system.

Non-Program of Record (NPOR) — Non-Program of Record systems or capabilities are items that are not DoD Programs of Record and may include nonstandard items.

NTIB — Acronym for National Technology and Industrial Base, the people and organizations engaged in national security and dual-use research and development (R&D), production, maintenance, and related activities in industry and technology within the United States, Canada, the United Kingdom, Australia, and New Zealand.

Operational Plans — A complete and detailed plan for conducting military activities prepared in response to actual and potential contingencies.

Organic Industrial Base — Network of U.S. government-owned industrial facilities operated by both the Department of Defense and government contractors. See also GOGO/GOCO.

POM — Acronym for Program Objective Memorandum, it is a critical part of the PPBE cycle. It is the phase in which the DoD develops and submits its budget requests to the Office of the Secretary of Defense (OSD) for review and approval. The POM contains detailed program and budget information for each defense program and is used to make funding decisions. See also PPBE.

PPBE — Acronym for Planning, Programming, Budget, and Execution, it is the overarching framework that the DoD uses to develop, justify, and execute its budget. It is a cyclical process that involves multiple phases, including planning, programming, budgeting, and execution. PPBE ensures that the DoD's financial resources are allocated to the most critical defense priorities.

Production Diplomacy — A production strategy that emphasizes friend-shoring, on-shoring, and working with allies and partners to minimize reliance on products from adversaries.

Project Spectrum — A comprehensive, cost-effective platform initiated by the DoD Office of Small Business Programs that provides companies, institutions, and organizations with cybersecurity information, resources, tools, and training. Its mission is to improve cybersecurity readiness, resiliency, and compliance for small/medium-sized businesses and the federal manufacturing supply chain.

RDT&E — Acronym for Research, Development, Test & Evaluation, one of the five major appropriations used by the DoD. RDT&E finances research, development, test and evaluation efforts performed by both contractors and government installations in the development of equipment, material, or computer application software. This includes services (including government civilian salaries), equipment, components, materials, end items and weapons used in such efforts.

Reskilling — Employee reskilling involves learning new skills outside of the worker's existing skillset. These skills are often closely adjacent to their current function but may sometimes be geared toward a different path entirely.

SBIR — Acronym for Small Business Innovation Research, a program established in 1982 to strengthen the role of innovative small businesses in Federally funded research or research and development (R/R&D). Specific program purposes are to: (1) stimulate technological innovation; (2) use small business to meet Federal R/R&D needs; (3) foster and encourage participation by socially and economically disadvantaged Small Business Concerns (SBCs) (SDBs), and by women-owned SBCs (WOSBs), in technological innovation; and (4) increase private sector commercialization of innovations derived from Federal R/R&D, thereby increasing competition, productivity and economic growth.

SCALE — Acronym for Scalable Asymmetric Lifecycle Engagement (SCALE) network, a program for semiconductor workforce development in the defense sector. SCALE provides unique courses, mentoring, internship matching and targeted research projects for college students interested in five microelectronics specialty areas: radiation-hardening, heterogeneous integration/advanced packaging, system on a chip, embedded system security/trusted AI, and supply chain awareness.

SCDTF — Acronym for Supply Chain Disruption Task Force, established by President Biden through Executive Order 14017 in 2021, to address economic recovery efforts following the COVID-19 Pandemic.

Standardization — The process of developing and agreeing on (by consensus or decision) uniform engineering criteria for products, processes, practices, and methods for achieving compatibility, interoperability, interchangeability, or commonality of materiel.

STTR — Acronym for Small Business Technology Transfer, a program established in 1992 to expand public/private sector partnerships and stimulates ideas and technologies between innovative SBCs and non-profit Research Institutions. By providing awards to small businesses for cooperative R/R&D efforts through formal collaborations with Research Institutions, the STTR program assists the U.S. small business and research communities by supporting the commercialization of innovative technologies. STTR's most important role is to bridge the gap between basic R&D and commercialization of resulting innovations.

STEM — Acronym for Science, Technology, Engineering, and Mathematics.

Sub-tier — Any supplier that indirectly provides components or services to the Department indirectly through another contracted entity.

Supply chain visibility — The ability to track different goods and/or products that are components in complex systems, giving a clear view of the origin of raw materials and details of manufacture of each of these components. It enables shippers to improve customer service and cost controls through management of inventory in motion, proactive status updates, limiting disruptions and risk mitigation.

Team Telecom —An interagency committee that advises the Federal Communications Commission (FCC) on national security and law enforcement concerns associated with applications for telecommunications licenses meeting certain thresholds of foreign ownership or control.

Upskilling — Upskilling involves workers expanding their existing skill set to enhance performance for their current or future roles.

National Defense Industrial Strategy

