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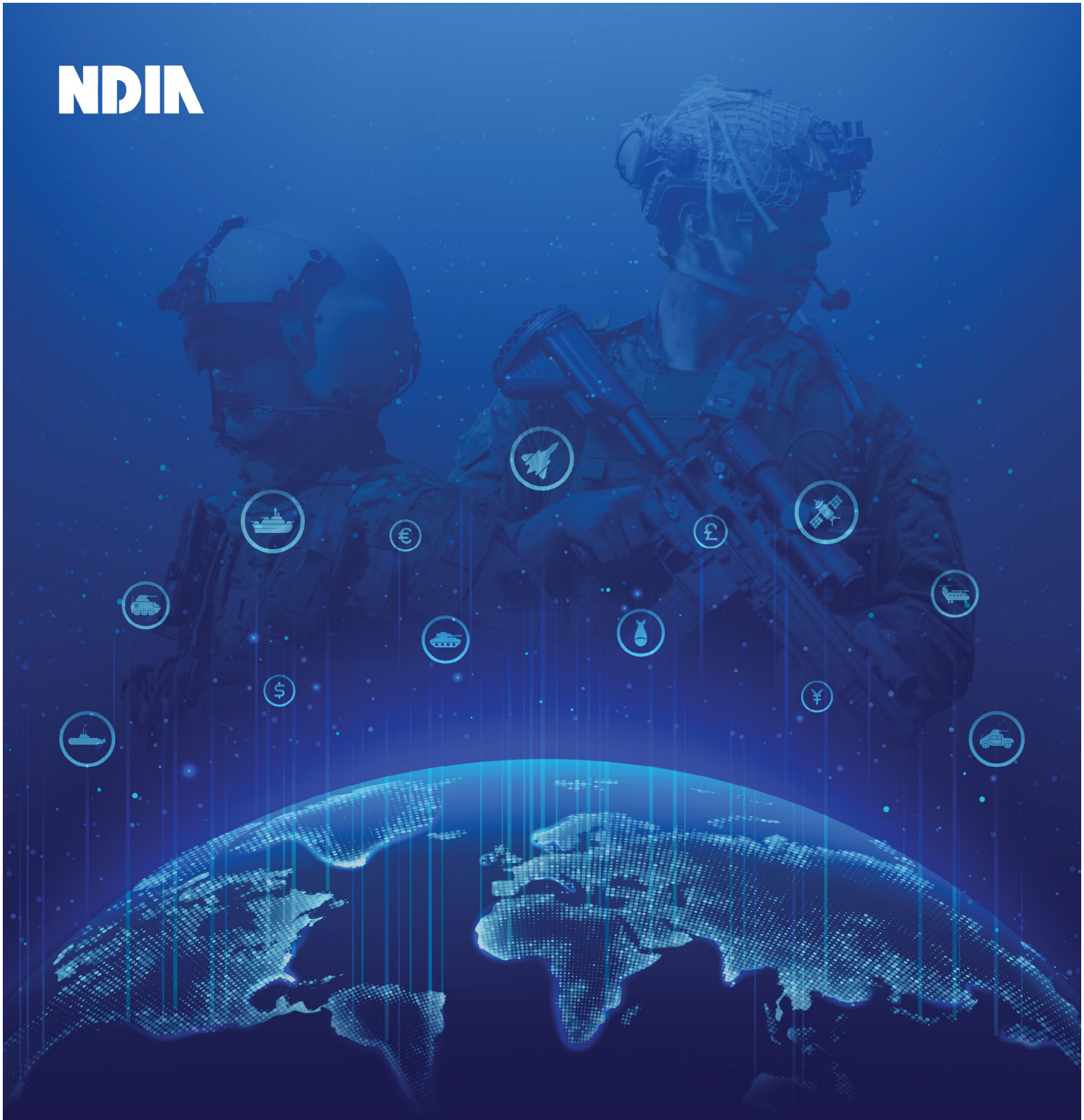

VITAL SIGNS 2023

Posturing the U.S. Defense Industrial Base for Great Power Competition

There is a mismatch between what our national strategies aim to achieve and how our defense industrial base is postured.

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Erratum: Version 1, published on February 8, 2023, contained errors in charts on page 15. This PDF is Version 2 of this report, published on February 10, 2023, and contains the revised numbers on those charts.

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EXECUTIVE SUMMARY

The *2022 National Security Strategy* (NSS) states that "the post-Cold War era is definitely over and a competition is underway between the major powers to shape what comes next."[1] Unfortunately, the defense industrial base (DIB) resiliency required to sustain the U.S. in great power conflict was sacrificed as part of the 1990s peace dividend. The powerhouses of industrial readiness – stable and predictable budgets, an experienced and specialized workforce; diversified and modern infrastructure; manufacturing innovation; and sufficient, including idle, capacity – have all atrophied under the combined transition to a services-based economy with a premium on just-in-time commercial supply chains.

The capacity of the U.S. defense industrial base to grow its output, fulfill a surge in military demands, and reconstitute in a major conflict stands as a key test of its health and readiness. There is a mismatch between what our national strategies aim to achieve and how our defense industrial base is postured. **Key industrial readiness indicators for great power competition are going in the wrong direction:**

- **Fewer People.** In 1985, the U.S. had 3 million workers in the defense industry.[2] By 2021, the U.S. had 1.1 million workers in the sector.
- **Fewer Companies.** In the last five years, the defense ecosystem has lost a net 17,045 companies[3] and the Department of Defense estimates the number of small businesses participating in the defense industrial base has declined by over 40% in the last decade.[4]
- **A Shrinking Financial Commitment.** From 1985 to 2021, national defense spending dropped from 5.8% to 3.2% of U.S. GDP[5], and the Congressional Budget Office projects a further decline to 2.7% by 2032.[6]
- **Less Predictability.** In 13 of the last 14 years, the federal government has operated under a continuing resolution (CR) for part of the year, preventing new starts essential for modernization and delaying increased production rates, multi-year procurement authorities, and advanced procurement funding essential for building capacity.
- **Limited Surge Capacity.** A lack of investment in infrastructure, equipment, idle capacity, and tooling, as well as an over-reliance on sole source suppliers, challenges both the readiness and the reconstitution of industry.

The federal government must prioritize removing policies, regulations and authorities that are strangling the defense industrial base and make significant, sustained and predictable financial investments to rebuild the DIB's strategic endurance and resilience. In the *Vital Signs 2023* survey, NDIA member companies are emphasizing that the federal acquisition process is growing more – not less – cumbersome; the lack of budget stability is breaking companies and causing significant workforce uncertainty; and the challenges of finding and retaining talent are impacting even our most strategic defense programs. The current inflation level was also highlighted as a cross-cutting issue impacting both the acquisition process and workforce management. Strong defense industrial readiness – ensuring our warfighters have everything they need so they never engage in a fair fight – is a key element of national deterrence. And if conflict ever erupted, national leaders will only have credible response options if they inherit the right investments to the DIB from this current generation of leaders. The government and the private sector must adapt, together, to address these challenges.

Key industrial readiness indicators for great power competition are going in the wrong direction.

INTRODUCTION

The National Defense Industrial Association (NDIA) has published *Vital Signs* over the last three years to encourage conversations at all levels of government and among Americans interested in national defense about the necessary policies and investments required to maintain the superior readiness of the U.S. defense industrial base (DIB). The defense industrial readiness policy goal is straightforward: to ensure our warfighters have the platforms, services, and technologies they need so they never engage in a fair fight against any competitor. This goal is personal for many working in industry. From the largest defense contractors to small defense companies and technology start-ups, many either have served in the U.S. military, or have family and friends who are serving, and therefore are committed to U.S. defense industrial readiness as national service from a different angle.

The capacity of the U.S. defense industrial base (DIB) to grow its output, fulfill a surge in military demands, and reconstitute in a major conflict[7] stands as a key test of its health and readiness. U.S. policies and financial investments are not currently oriented to support a defense ecosystem built for peer conflict. This was a troubling truth during the last twenty years of asymmetric conflict against non-state actors. In the return of great power competition, this gap is an unsustainable indictment.

Vital Signs 2023 seeks to convince the most experienced defense policy makers – both in and out of government – that despite significant analysis, extensive work by both the executive and legislative branches, and a widespread, bipartisan determination to fix the challenges impacting the defense ecosystem, the gap between intentions and the outcomes of current policies and processes is widening. Therefore, this year's report on the DIB departs significantly from earlier editions. While previous reports had over 60 indicators and included contextual challenges the DIB faced – for example, the global pandemic response of 2020 and 2021 – this edition seeks to draw laser-focused attention to the enduring, systemic challenges NDIA member companies highlighted as their top concerns as they seek to re-orient in the current security environment. Specifically, NDIA member companies are emphasizing to government policy makers and external audiences that the federal acquisition process is growing more – not less - cumbersome; the lack of budget stability is breaking companies and causing significant workforce uncertainty; and the challenges of finding and retaining talent are impacting even our most strategic defense programs. The current inflation level was highlighted as a cross-cutting issue impacting both the acquisition process and workforce management. Failure to tackle these challenges will afford a competitive advantage of rivals to U.S. global leadership.

The authority of NDIA's leadership voice in educating external stakeholders on the current and projected health of the defense ecosystem is based on the breadth and diversity of the companies it represents. Over 170 NDIA member companies, representing 35% of total defense spending in Fiscal Year 2022, participated in the survey underpinning *Vital Signs 2023*, almost evenly distributed among small, medium, and large companies.

The industrial ecosystem around the Department of Defense has clarity on the return of economic and technological great power competition. The purpose of *Vital Signs 2023* is to provide the U.S. government and external audiences with the same clarity regarding the challenges preventing the DIB from fully realizing the public policy goal of being the modern, diverse, and resilient ecosystem required to support the U.S. military in the current security environment.

METHODOLOGY

This year's edition of *Vital Signs* differs significantly from previous years. Previous reports tracked over 60 indicators to assign an overall health grade for the U.S defense industrial base (DIB). This edition builds on the insight accrued from previous versions and instead focuses on the structural issues impacting the DIB and the implications for its ability to posture and, if necessary, reconstitute in an era of great power competition.

Vital Signs 2023 has three main sources of data: the first is a proprietary survey conducted by NDIA that leverages the strength of NDIA's robust membership – representing companies of all sizes across all DIB sectors.

The second source of information – publicly available reports and data – reflects current administration policies, federal government statistics and metrics, bipartisan executive and legislative public reports, and analysis from research institutions. The purpose is to demonstrate a clear comparison between public policy goals and current public policy outcomes.

The third source (comprising three indicators) does not come from publicly available data: (1) the number of workers in the DIB; (2) the number of DIB companies; and (3) the number of new DIB entrants. Govini, a decision-science company – with whom NDIA has partnered in the past – routinely engages the Department of Defense (DoD) in research initiatives, provided the last two data points.

To calculate the total number of workers in the DIB, NDIA used the following methodology:

- NDIA reviewed all DoD contracts – identified by North American Industry Classification System (NAICS) codes – in Bloomberg Government[8] for Fiscal Year 2022 (FY22).
- NDIA then compared the 100 largest NAICS codes for DoD spending against the Bureau of Economic Analysis data on total economy-wide spending for that particular NAICS code.
- DoD spending levels were then taken as a fraction of the total spending to determine its percentage of each NAICS code.
- NDIA then used Bureau of Labor Statistics data to approximate the total number of workers in a NAICS code. That number was then multiplied by the fraction of the NAICS for DoD spending. For example, if eighty percent (80%) of a NAICS code is DoD spending, we estimated that 80% of the workers in the NAICS code work in the DIB.
- Finally, the number of workers for each NAICS code was totaled to get an estimate for the total number of workers in the DIB.

THE EVOLVING STRATEGIC ENVIRONMENT

The U.S. is in the middle of a period of profound transition, both domestically and internationally. Over the past several decades, our economy has transitioned from primarily a manufacturing and goods economy to a digital and services economy. Since 2008, the country has grappled with the social and economic consequences of parts of the country not fully recovering from the Great Recession. The global pandemic of 2020 caused significant shifts in population demographics and what Americans buy and consume. These trends have changed how Americans work, connect, and communicate with each other, and it has shifted demand and supply for the education and training pipelines designed to prepare new entrants for the workforce. Government at the federal and state level are in the process of responding to this significant reorientation of American society.

The magnitude of the transition and its associated disruptions have caused the U.S. to look inward. Polling from the 2020 Presidential election and the 2022 Congressional midterms both showed national security challenges ranked well below economic and cultural concerns.[9] One of the organizing themes of both the last two presidential elections was the focus on rebuilding American domestic resiliency with specific emphasis on American workers and economic sectors that have not benefited from the transition to a digital and services economy. As will be discussed further, critical components of the U.S. defense industrial base (DIB), including the manufacturing sector and skilled trade employment, have atrophied in this economic transition.

These dynamics have been building for over 30 years under the leadership of multiple U.S. Presidents and Congresses. Upon the conclusion of the Cold War, President George H. W. Bush announced the world had entered a "unipolar moment." Instead of great power competition, the common aspiration for peace and prosperity would be a unifying force. To close a bipartisan budget deal, Congress reduced the budget for the Department of Defense (DoD), and the U.S. concluded the robust military build-up initiated under the Carter Administration and accelerated under the Reagan Administration. U.S. international leadership shifted its focus to integrating the largest global economies into the institutions of the international system. After the expense – in both blood and treasure – of the ideological struggle of the Cold War, the U.S. appeared to have finally won its peace dividend. But world history is replete with the results of dominant countries assuming the world will remain static under preferred power structures.

Nearly three decades later, it has become clear that despite the promise of the early 1990s, the peace dividend was a phase of respite, not the conclusion of a global battle over leadership and values. The *2022 National Security Strategy* (NSS) states that "the post-Cold War era is definitely over and a competition is underway between the major powers to shape what comes next."[10] The U.S. is once more engaged in economic and technological competition with the governments of the People's Republic of China (PRC) and the Russian Federation. Each capital, seeking to reassert its will within its traditional spheres of influence, has become more aggressive. Beijing has taken steps to militarize and control the South China Sea, through which energy resources to Northeast Asia and international commerce flow, and it is taking a whole of nation approach to coercively integrate Hong Kong and to signal its intention to eventually do the same to Taiwan under the Chinese Communist Party's (CCP) rule. Meanwhile, a dictator in Moscow initiated an illegal and brutal invasion of Ukraine, a sovereign neighboring country. In both cases, each country is seeking to capitalize on the U.S.' inward focus to re-establish buffer zones against perceived external threats based on historical and psychological security vulnerabilities.

In 2018, the Department of Defense assessed it would take significant time and government financial resources to reorient the defense industry to effectively handle peer conflict.

– DoD Report, 2021

In this context, the U.S., along with its Allies and partners, must be prepared to prevail in the return of great power competition. One key area in which the U.S. must re-establish its competitive advantage is revitalizing a brittle U.S. DIB. The capacity of the DIB to grow its output, fulfill a surge in military demands, and reconstitute in a major conflict stands as a key test of its health and readiness. Currently, U.S. policies and financial investments are not oriented to support a defense ecosystem built for peer conflict. In 2018, the DoD assessed it would take significant time and government financial resources to reorient the defense industry to effectively handle peer conflict, requiring: "[difficult] but necessary investment choices, including expanded funding for capital investment in facilities and training and maintaining the workforce. Without that serious and targeted investment – billions instead of millions – America's DIB is simply unsustainable, let alone capable of supporting our deployed forces and legacy equipment while solving complex warfighting challenges posed by advanced technologies in the 21st century, from AI and cyber to hypersonics and autonomous air and sea systems."[11]

THE RISE OF NEAR-PEER COMPETITORS

While the U.S. talks about the re-emergence of great power competition, its global competitors are focused on eroding U.S. economic and military competitive advantage. In 1985, at the height of the U.S. military build-up for peer competition against Russia, the People's Republic of China (PRC)'s GDP was only 15% of U.S. GDP. In 2016, China surpassed the U.S., and by 2021, China's GDP was 118% of U.S. GDP (adjusted for purchasing power).[12] From this position of economic strength, the PRC is taking a disciplined approach to re-order the international system – its rules, norms, standards, and values – on terms favorable to itself.

China is also steadily increasing its defense spending and advancing its military capabilities. The PRC has made significant financial investments in its DIB, jumping from $10 billion in 1999 to $293 billion in 2021.[13] With strategic discipline, the PRC is using those financial investments to steadily modernize its nuclear capabilities; hone sophisticated strike, space, and cyber capabilities; and build out its navy in "one of the most remarkable and strategically disruptive global defense spending trends in the last two decades."[14]

Defense spending is only one part of the story. The PRC is also demonstrating its intentions by harnessing the power of strategic industrial policy. The Chinese Communist Party's (CCP) leadership is also focused on building internal resilience and decreasing external dependence of the country's "productive forces," especially its industry, infrastructure, human capital and technology.[15] Through its Dual Circulation Policy, the CCP is determined to reduce its vulnerability to being interconnected with and dependent on an international economy. Simultaneously, the CCP also intends to increase the vulnerability of other countries by deepening their dependence on China in the ultimate expression of national self-protection. While for the last thirty years the U.S. pursued policies that led to both boom-bust cycles of defense spending and drastic consolidation of the largest defense contractors from fifty-one to five,[16] the PRC has leveraged its growing GDP to expand its defense industrial sector.

In addition, Russia's military capabilities oriented to great power competition are also significant. Due to active conflict related to the illegal invasion of Ukraine, any snapshot of Russian military capabilities and intentions for this report would be fragile and quickly perishable. Therefore, *Vital Signs 2023* will focus on Russian military ambitions for any potential peer conflict. To that end, it is important to note the Russian government's focus is on nuclear, long-range, and precision strike capabilities; unmanned underwater vehicles; hypersonic strike systems; and sophisticated space and cyber capabilities.

The illegal invasion of Ukraine highlights the shallow industrial bench for critical conventional and precision-guided munitions and their component parts. Congressional leadership during an oversight hearing on defense industrial readiness emphasized the "lack of responsible and rapidly scalable production capacity… highlights issues with our planning factors and manufacturing flexibility for long-lead items needed in short order, with little or no advanced warning."[17] In the same hearing, it was noted that when the government does not pay to maintain production capacity, testing equipment will become obsolete and supply chains are likely to have broken links.[18]

"[T]he trouble is we have a two to five year lag to bring [munitions] stocks back. We have that because we have not invested, as a nation, in the infrastructure, the equipment, and the tooling to have capacity and throughput."[19]

In 1985, China's GDP was only 15% of US GDP. In 2016, China surpassed the U.S., and by 2021, China's GDP was 118% of U.S. GDP (adjusted for purchasing power).

The invasion has reminded government leaders on both the lead times required to start or expand production lines and the investment necessary to replenish and sustain dangerously low stockpiles for both the U.S. and its network of alliances and partnerships.

THE U.S. RESPONSE

In this evolving geostrategic environment, the Department of Defense (DoD) is pursuing both near-term and long-term strategies to maintain deterrence and enhance readiness. The Department is currently focused on:

- reinforcing current U.S. military deterrence capability.
- working with U.S. Allies and partners.
- shoring up fragile and vulnerable supply chains for the Department's most sensitive systems, services, and components, including microelectronics.
- building resiliency in the defense industrial base (DIB); accelerating research, development, and prototyping and fielding of operationally relevant emerging disruptive technology; and
- engaging in campaigning and exercises to refine and modernize its operational concepts.

While focused on the very near future, DoD is simultaneously working through its long-term strategy and looking further out to the mid-2030s as it considers peer conflict. For the last 40 years, the U.S. has benefited from a technological competitive advantage which afforded it unimpeded logistics and power projection, military dominance in every operational domain, and – despite the brutality of violent extremist organizations – asymmetric fighting advantages against its adversaries. The cost of war was borne by a portion of the Joint Force, and most Americans were shielded from direct, daily reminders of the human cost of conflict.

A return to great power competition changes each of these dynamics. With Russia modernizing its nuclear strike systems, and China focused on building out its nuclear capabilities, as well as adversary advancements in hypersonic and offensive cyber and space capabilities, the U.S. homeland is no longer considered a sanctuary, which is why defending the U.S. homeland is the 2022 NDS's first articulated priority.[20] Conflict with one or more near peer competitors will likely involve asymmetric attacks on U.S. critical infrastructure, contested and degraded logistics and communications, and dispersed U.S. units fighting directly against adversaries with platforms, systems, and munitions of roughly technical parity. In great power competition, the entire nation, not just parts of the Joint Force, will be directly impacted by any potential conflict.

A key area of tension for both the near- and long-term strategies is to balance resource requirements to address the changing *character* of war with the resource requirements that address the inherent *nature* of war. Discussions regarding the future *character* of war focuses on the use of emerging disruptive technology, such as artificial intelligence and machine learning; offensive and defensive cyber; autonomy for unmanned platforms; Fifth Generation (5G) and Future Generation (FutureG) communications and information technology; hypersonics, quantum computing; and directed energy. This appropriately drives federal policymakers – in both the executive and legislative branches – to find ways of integrating nontraditional defense companies, as well as national laboratories and academia, into the defense industrial ecosystem. The Russian invasion of Ukraine has emphasized both the powerful effects of emerging disruptive technology on the battlefield and the importance of partnership with these public and private sector entities.

At the same time, discussions regarding great power conflict cannot ignore the inherent *nature* of war, which involves direct contact with the enemy and requires the prevail not just of national will, but also sufficient industrial capacity to produce and replenish platforms, munitions, and materiel. For industry, this requires consistent, steady policy and financial investments to increase the capacity and modernization of our defense infrastructure, including shipyards, machine tooling industrial facilities and the ability to accelerate advancements in the capabilities of our nuclear triad; major air, land, and sea platforms; and conventional as well as precision-guided munitions.

One of the biggest challenges will be to align the DoD's senior civilian leadership, the military services and combatant commands, Congress, and defense industry over the sequencing and resourcing priorities for peer conflict over the next fifteen years. Currently, industry is trying to respond to multiple planning timelines for any potential peer conflict. On the one end, DoD's senior civilian leadership is trying to prepare the Joint Force for conflict in the mid-2030s, which emphasizes U.S. technological competitive advantage and updated operational concepts, while the military services, combatant commands, and Congress are more oriented to preparing for conflict within the next five years, which requires the necessity of ramping up capacity. A high-end fight with a peer adversary will require the U.S. to have both technological advantages and significantly expanded capacity.

SURGE LIMITATIONS OF THE COMMERCIAL INDUSTRIAL BASE

During the last two major defense industrial build-ups in U.S. history – during World War II and during the Carter and Reagan Administrations – the U.S. was able to surge the existing capacity in its commercial industrial base to augment the specialized expertise of the defense industrial base (DIB). This is not currently a viable option for several reasons, including a significant decline in the workforce with relevant skills and a consolidation of the infrastructure required to surge a ramp–up of significant capacity.

The atrophy of the U.S. manufacturing sector is a critical issue in an era of economic and technological great power competition. Manufacturing is a critical, foundational element of the defense industrial workforce, and the trend line for skilled manufacturing workers is rapidly going in the wrong direction. Since its peak in June 1979, the U.S. manufacturing sector lost 7.1 million jobs – 36% of the industry's workforce – with more than 5 million manufacturing jobs since 2000 alone.[37] As the Department itself notes, the "advanced weaponry and supporting equipment necessary to dominate in modern warfare require highly sophisticated manufacturing, yet the domestic workforce has suffered for decades."[38]

The nexus of a declining U.S. manufacturing base and a reduction in defense industrial readiness has drawn the attention of national policymakers on a bipartisan basis. In the *2017 National Security Strategy*, the intersection between the U.S. manufacturing base and defense capabilities received significant attention, concluding with the point that as "America's manufacturing base has weakened, so too have critical workforce skills ranging from industrial welding to high-technology skills for cybersecurity and aerospace."[39] The *2022 National Security Strategy* highlighted the importance of a strong U.S. manufacturing sector as a critical factor in the U.S.'s ability to successfully respond to the illegal invasion of Ukraine.[40]

As previously discussed in this report, the last two presidential elections focused on rebuilding American domestic resiliency with specific emphasis on American workers and economic sectors that have not benefited from the transition to a digital and services economy, of which the manufacturing sector is one of the primary drivers of this focus. There can and should be significant, bipartisan interest at the national level to continue to address the challenges impacting this foundational part of the American economy. As a policy matter, one of the challenges is the need to reinvigorate the reputation and respect for expertise in skilled trades. The transition to a services economy has not only resulted in a decline in manufacturing, but correspondingly has reduced the demand for skilled labor. NDIA member companies note new entrants to the job market are not necessarily encouraged to pursue apprenticeships and work in the skilled trades. This is consistent with the *2021 House Armed Services Committee Defense Critical Supply Chain Task Force report*, which highlighted the "challenges related to social perceptions of industrial and manufacturing work."[41]

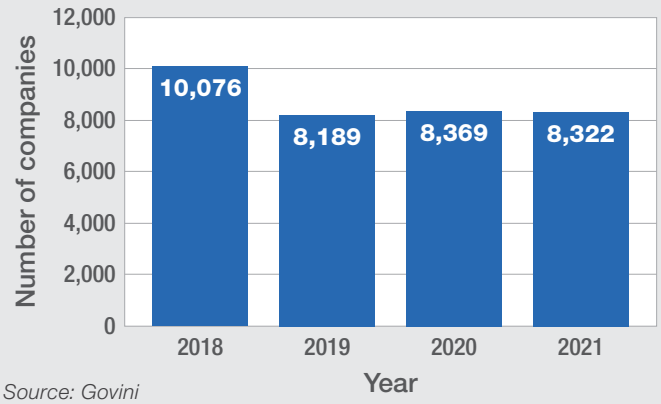
RESTORING INDUSTRIAL READINESS POWERHOUSES

The defense industrial base (DIB) resiliency required to sustain the U.S. in great power conflict was sacrificed as part of the 1990s peace dividend. **The powerhouses of industrial readiness – stable and predictable budgets, an experienced and specialized workforce; diversified and modern infrastructure; manufacturing innovation; and sufficient, including idle, capacity – have all atrophied** under the combined transition to a services-based economy with a premium on just-in-time commercial supply chains. And it is suffocating under a worldview paradigm that fails to resource the industrial footprint required to prevail in near-peer conflict.

The *2022 National Defense Strategy* (NDS) emphasizes deterrence by resilience and defines resilience as "the ability to withstand, fight through, and recover quickly from disruption."[21] For the U.S. defense industry to effectively partner with DoD, the federal government must prioritize resetting policies, regulations, and authorities that are strangling the DIB and to make significant, sustained, and predictable financial investments to rebuild the DIB's strategic endurance and resilience.

Public policy prioritizes expanding, modernizing, diversifying, and building resilience into the DIB, and there has been sustained bipartisan efforts to attract new Department of Defense (DoD) commercial partners. In addition, the illegal invasion of Ukraine and increased attention to the security environment in the Indo-Pacific region are setting the conditions for an increased demand signal from the Department to industry. And yet, in recent years, the U.S. DIB has declined in size. While there were just over 8,300 new entrants in 2021, even more firms left with the total number of defense companies declining by over 3,300 in the same period. In the last five years, the DIB has lost 17,045 independent companies. In addition, DoD estimates the number of small businesses participating in the DIB has declined by over 40% percent in the past decade.[22] These net numbers also hide other vulnerabilities to the readiness and reconstitution of industry. One key issue is the over-reliance of sole source suppliers, including from foreign sources. In *Vital Signs 2023*, 42% of the NDIA member companies reported being the sole eligible provider in the U.S. for a defense related product. The U.S. defense sector is contracting and is not diversifying, the exact opposite of policy objectives.

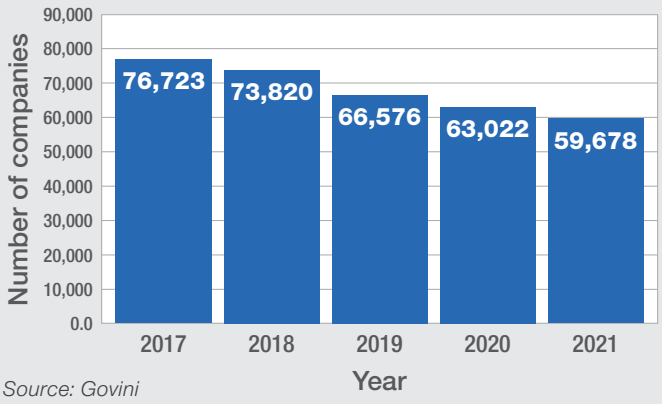
FEWER FIRMS ARE ENTERING THE U.S. DIB



Source: Govini

Figure 1: **New Entrants In The U.S. DIB**

THE U.S. DIB IS SHRINKING



Source: Govini

Figure 2: **Total Number of Companies in the U.S. DIB**

To align policy objectives with the preferred outcomes of an experienced and specialized workforce, diversified and modern infrastructure, manufacturing innovation, and sufficient capacity, the federal government – both executive and legislative branches – must address the most pressing challenges preventing the defense ecosystem from re-posturing:

- **inflation impacts.**
- **burdensome acquisition processes and regulation.**
- **the lack of budget sufficiency and stability; and**
- **finding and retaining workforce talent.**

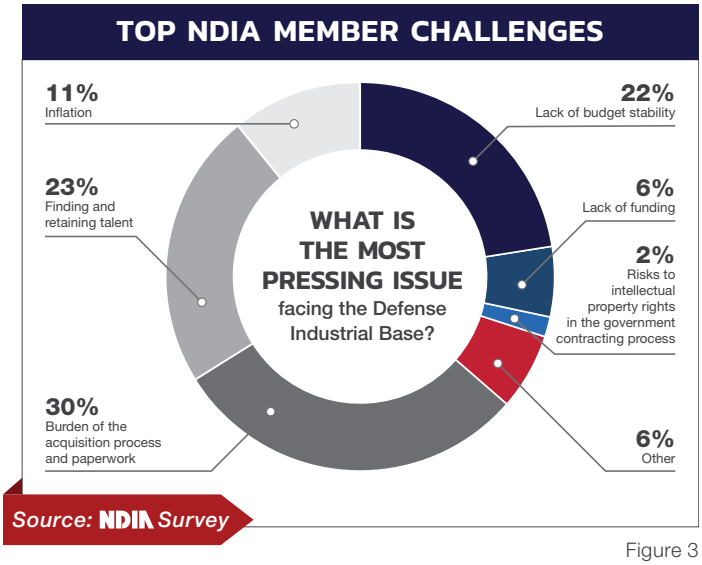


Figure 3

Addressing Inflation Challenges

U.S. defense companies are facing significant domestic economic headwinds. The Federal Reserve aggressively used its economic management tools in 2022 to reduce inflation rates, which reached their highest levels in 40 years.[23] It raised interest rates seven times[24] in 2022, driving many financial analysts to conclude that its efforts to tame inflation may trigger an economic recession. In December 2022, the Federal Reserve increased interest rates to 4.5%, the highest in 15 years.[25] Increased interest rates increase the cost of capital, restrict both demand and supply for commercial loans, and heighten the specter of recession conditions. The *Vital Signs 2023* survey results reflect the general unease NDIA member companies have regarding challenging macroeconomic conditions continuing in 2023. **While roughly one in five surveyed companies assessed general business conditions would improve, the majority – 78% – thought conditions would either remain the same or get worse.**

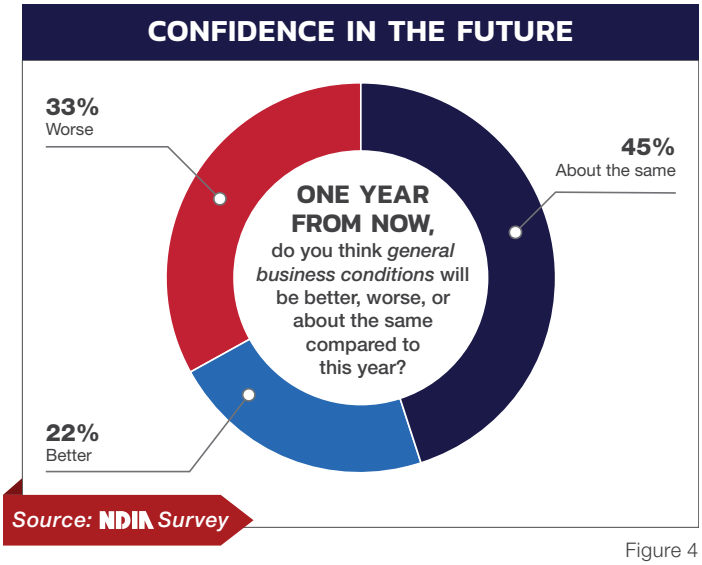


Figure 4

The underpinning drivers of high inflation levels are geo-strategically fragile supply chains, amplified by the backlogs created during the 2020-2021 global pandemic, and tight labor markets. The combination of highly disrupted supply chains, uneven swings in consumer supply and demand for goods and services, and altered and tightening labor markets led to government intervention across the economy in 2020 and 2021, including for the DIB.[26] *Vital Signs 2023* reflects these ongoing factors. NDIA member companies were particularly concerned about increased cost of production inputs (59%), increased labor costs (72%), and finding or retaining workers (88%).

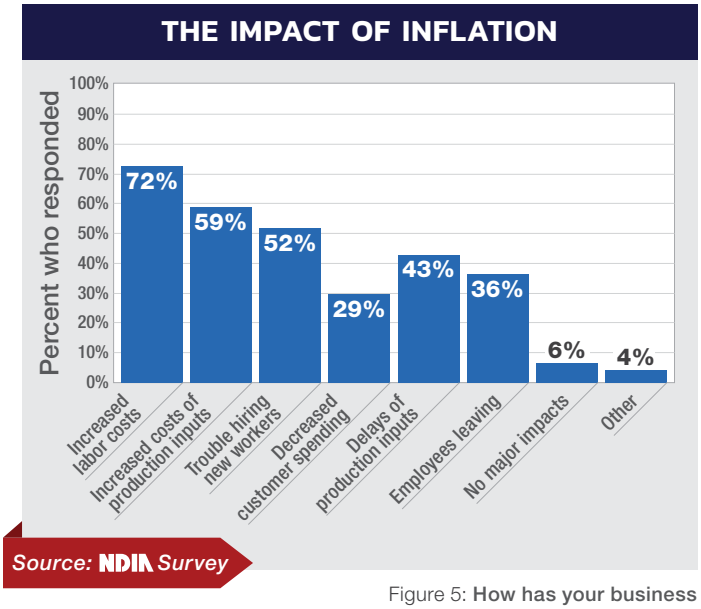


Figure 5: **How has your business been affected by inflation?**

NDIA previously reported[27] on the damaging impact inflation is having on defense contracts. While new contracts being awarded will factor recent inflation levels, acquisition contracts currently being executed were *negotiated prior to* these historically high levels. Congress provided both authority and funding in the fiscal year 2023 legislative cycle to provide broad relief to any current contracts being renegotiated due to revised economic adjustments, with no limitation on the year of award. Transparency regarding the implementation decisions and the funding distributions will be important, especially regarding adjustments for small businesses and middle tier suppliers.

Improving Doing Business with DoD

As previously noted, the defense ecosystem is shrinking, not expanding and diversifying. *In Vital Signs 2023*, NDIA member companies provided a baseline that it is easier to work with non-government customers than DoD. However, the survey results also indicate defense companies find it harder to do business with DoD than other federal customers.

The volume of literature tackling the origins and reasons of the complicated federal acquisition process is extensive, as have been the bipartisan government efforts to simplify the process. That said, there are key disconnects between government and industry in the federal acquisition process that merit mention in this report. These disconnects include failing to: develop sustainable requirements early in the process; maintain requirements discipline; support a common understanding between the executive and legislative branches of acceptable levels of risk in the prototyping, testing, and evaluation process; and rebuild a working understanding of the nexus between DoD budget formulation and private sector business decisions.

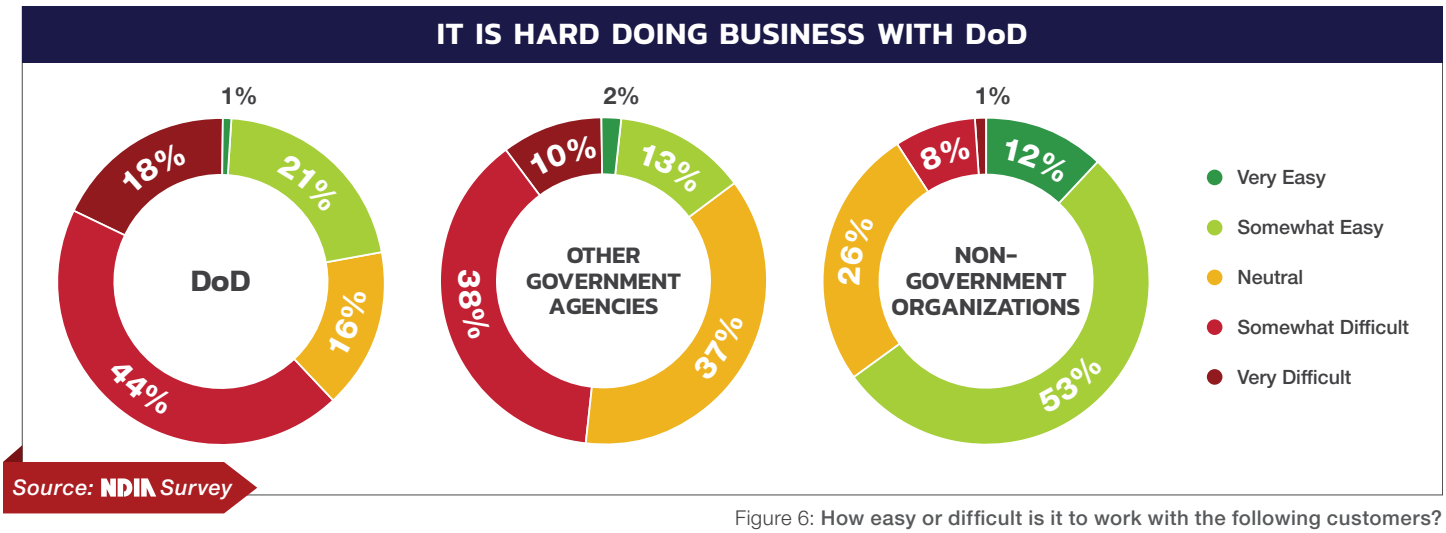


Figure 6: **How easy or difficult is it to work with the following customers?**

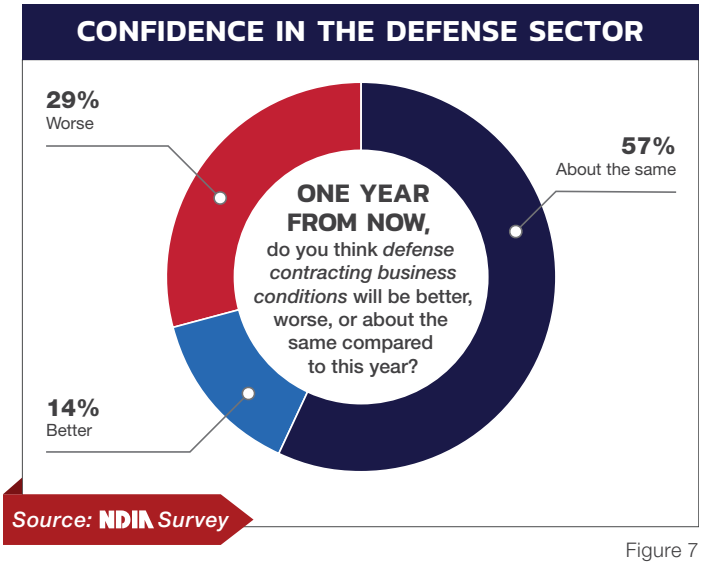


Figure 7

In addition, while all defense companies are impacted, small and medium sized businesses have unique challenges contending with compounding regulation or policy-driven acquisition requirements that are also putting significant pressure on companies. DoD itself recently acknowledged regulations can create barriers or increase the costs on small businesses that larger companies with more resources are better positioned to navigate.[28] Two current significant areas of concern for NDIA member companies are the proposed rule for disclosure of climate emissions and the pending rulemaking for the cybersecurity maturity model certification (CMMC) requirements.

In this context, it is unsurprising NDIA member companies have an even more pessimistic view about defense contracting business conditions improving in 2023 compared to general business conditions. Specifically, the *Vital Signs 2023* survey results showed that while 22% thought general business conditions would get better in 2023, only 14% thought defense contracting business conditions would improve. In addition, despite the continued public policy emphasis on acquisition reform, over half – or 57% - of survey respondents reported they expect defense contracting business conditions to remain the same in 2023. Industry's assessment that it will be harder to conduct business with the Department than in the civilian economy under these economic conditions is pointed feedback from an industry currently responding to surge demand signal with the illegal invasion of Ukraine and quietly preparing against the darkening security environment in the Indo-Pacific.

Prioritizing Sufficient & Stable Budgets

Unlike their peers in the commercial sector, U.S. defense companies are tethered to annual defense resourcing decisions. While defense spending is sizeable, it is near a record low as a percentage of the U.S. economy, and the current five-year outlook is even more challenging. For example, **observing the trend line from 1985 to 2021, national defense spending dropped from 5.8% to 3.2% of U.S. GDP.** Furthermore, the Congressional Budget Office forecasts defense spending as a percentage of GDP dropping to 2.7% by 2032.[29] The U.S. must change its defense resourcing strategy to support an industrial footprint required to prevail in great power conflict.

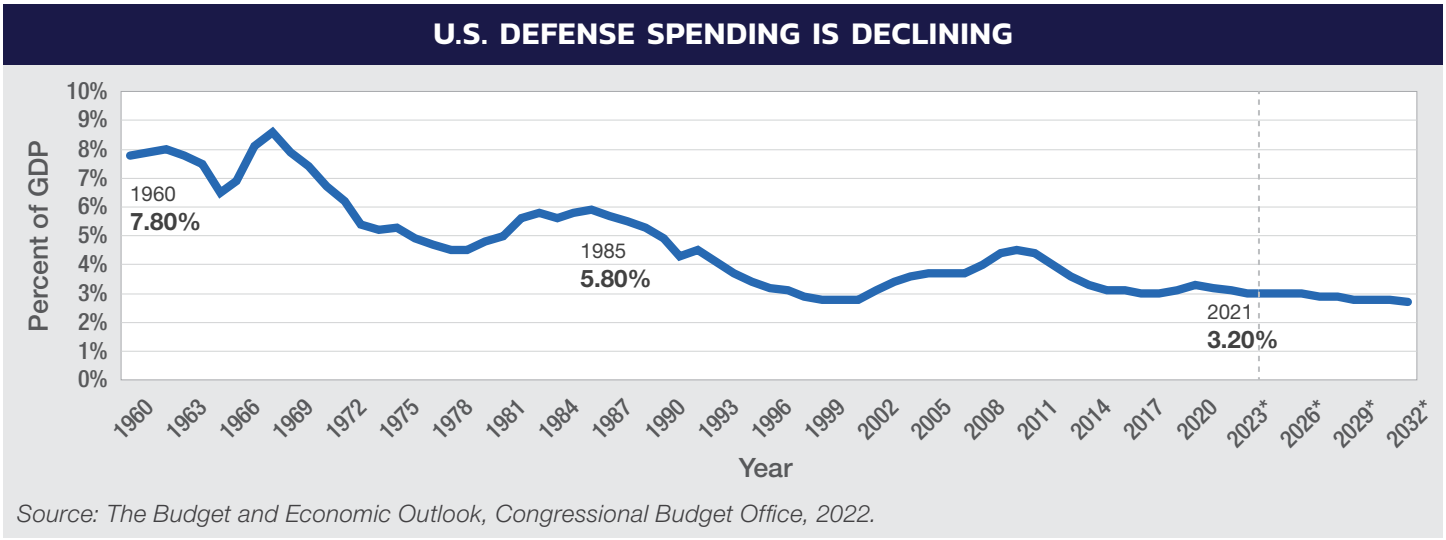


Figure 8: **Defense as a Percent of GDP**

The U.S. must re-prioritize budget stability and predictability for the federal government. DoD and the U.S. DIB have endured budget instability for 13 of the last 14 years as the federal government has operated under a continuing resolution (CR) for part of the year. Under a CR, the only authority the federal government, including DoD, has is to maintain the same rate of spending for current activities and therefore cannot begin new programs or initiatives. **The result is the parts of the budget most crucial to re-orient DoD to prepare for, deter, and – if necessary – respond to peer conflict are the accounts most vulnerable to being cut or squeezed during budget instability: research & development for emerging technologies, as well as procurement and sustainment of current and next generation major platforms.** Only rivals to U.S. leadership benefit from the misalignment of resources and the waste of time and momentum.

Furthermore, since fiscal year 2010, Congress has included additional language in every CR to further restrict "DoD's use of amounts appropriated through the CR to initiate new production of items, increase production rates above those sustained in the prior fiscal year, or initiate multi-year procurements using advance procurement funding for economic quantity procurements."[30] Multi-year contracts and procurement authorities for long-lead parts are critical contracting mechanisms essential to replenishing and increasing munition stockpiles. These contracting mechanisms are also critical to keeping strategic submarine construction schedules – which have little margin for error in replacing legacy capacity – on track. Therefore, every CR introduces delay and friction into critical acquisitions required to increase the capacity and enhance the capability of the U.S. military.

The continuing resolution (CR) "stopgap measures are wasteful to the taxpayer… [and] damage the gains our military has made in readiness and modernization. Ultimately, a CR is good for the enemy, not for the men and women of the U.S. military."[31]

– U.S. Congressional Hearing, 2019.

Resolution of political budget battles in Washington also do not necessarily translate into viable business solutions for defense companies. While a continuing resolution is preferable to a lapse in appropriations (colloquially referred to as a government shutdown), the hidden cognitive trap in this situation is that while institutions located in Washington, including the Pentagon, have adjusted their processes to insulate themselves – to the extent possible – from instability, the impact on the DIB remains acute. A continuing resolution puts pressure on the defense ecosystem, especially for technology start-ups, small businesses, and middle tier suppliers, as DoD's planning assumption under CRs is to build a six-month delay in contract obligations after the final budget is approved. In the interim, small- and medium-sized companies grapple with unpredictable cash flows and keeping critical nodes of their supply chains – often single source – viable. And **the imposition of stop work orders negatively impacts the hiring and retaining of workers with the right credentials and experience.**

Continuing Resolutions Create High Workforce Uncertainty

A NDIA member company, headquartered in the National Capitol Region, has several open contracts with a military service. For one of its most important contracts, it engages with the contracting office located in the Midwest, although the execution of the contract is in support of several military installations on the West coast, where most of its workforce is located. Over the last few years, under multiple continuing resolutions, the military service has several times issued a "stop work" notice to the company for this particular contract. Once the final appropriations bill has been approved, the military service has re-started the order.

Unfortunately, the cycle has caused significant financial and workforce challenges for the company. Each time the "stop work" notice comes through, the company has been forced to lay off employees and payout unused vacation and sick leave. This has happened several times as the holidays were approaching. And as the employees live in an area that has few alternative employment opportunities, most must apply for unemployment insurance and, increasingly, many of them also apply for workers' compensation benefits. Each time this happens, the company ends up losing some employees, but the cost increases each time they hire back the remainder because their insurance premiums to state worker compensation funds increase as the company's employment stability decreases. The company is just one specific example of the thousands of companies in the DIB that must decide each year if they are going to exit the sector. It also reinforces the point DoD made last year when it noted – in a report on the state of competition in the DIB – that "[f]luctuations in defense contracts increase the risk that individual companies will lose production work and be unable to retain their workers on defense production lines."[32]

Rebuilding An Experienced Defense Workforce

The U.S. has several competitive advantages compared to its global competitors. One is the quality of its experienced and specialized defense workforce, which must be both preserved and expanded. In the transition to a digital and services-based economy, the competition with the commercial sector for science, technology, engineering, and mathematics (STEM) workers is significant, and the overall manufacturing workforce has declined. In 1985, the U.S. had 3 million workers in the defense industry. By 2021, the U.S. had 1.1. million workers in the sector.[33] An experienced and specialized defense workforce is a critical element of restoring industrial readiness at the scale required for a fight with a peer competitor. Turning this trend line around will require sustained policy attention and significant resources to rebuild talent pipelines and to retain experienced workers.

The DIB faces significant challenges in filling both current and anticipated STEM and skilled labor employment. The Bureau of Labor Statistics (BLS) reports in 2021 there were nearly 10 million workers in STEM occupations across the U.S. economy, and this total is projected to grow by almost 11% by 2031, over two times faster than the total for all occupations.[34] Both the federal government and the DIB will be competition for these new entrants to the workforce with the commercial sector, which will have more flexibility in offering competitive compensation packages to recruit and retain them. This is an area of direct competition with U.S. rivals. A 2022 study by the RAND Corporation,[35] required by the Fiscal Year 2021 National Defense Authorization Act, assessed China will be vulnerable to significant workforce upheaval over the next ten years, with its STEM workforce insufficient in both quantity and quality in the next decade. Sustained and targeted policies to recruit and retain STEM workers in the defense industrial ecosystem would turn this race for talent into a competitive advantage for the U.S.

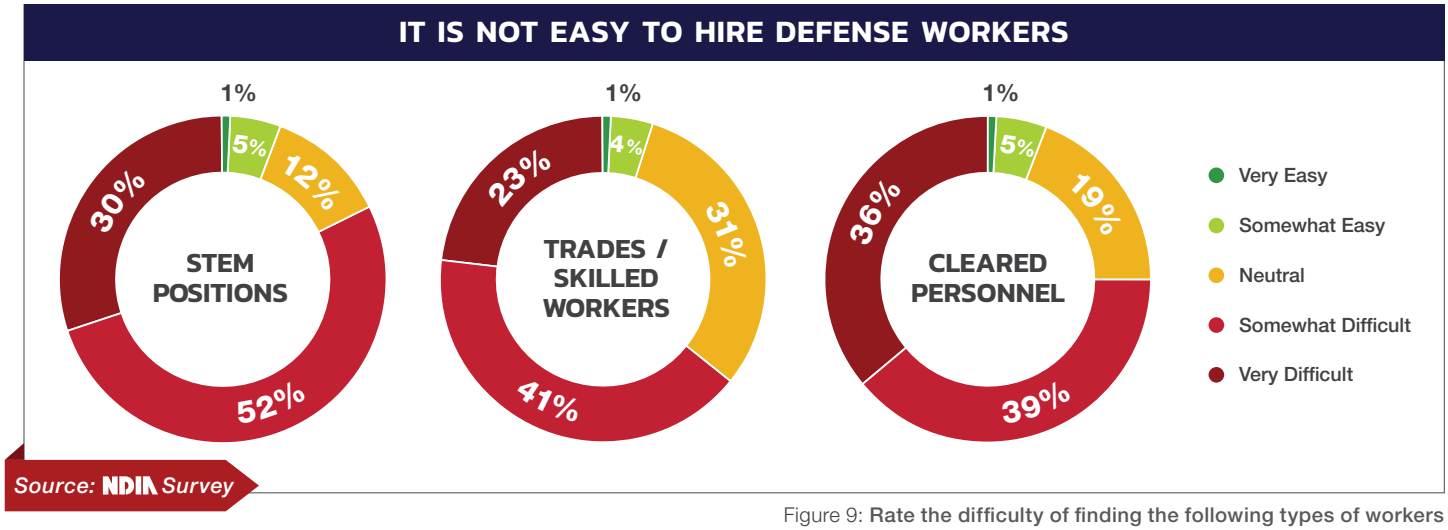


Figure 9: **Rate the difficulty of finding the following types of workers**

In addition, sustained and targeted policies to rebuild and expand the capacity of the defense skilled labor workforce is essential. The manufacturing sector has a tight labor market with a growing number of unfilled positions. In February 2022, the number of job openings increased from 577,000 to 808,000 open positions.[36] Reversing the loss of defense skilled labor and filling key vacancies matters under great power competition because skilled workers are essential to increasing the capacity of the U.S. military, including the construction of naval platforms and the production of ground vehicles and aircraft.

NDIA member companies highlight several factors contributing to their recruiting and retention challenges, including the rigidity of labor categories in contracts and the impact current inflation rates under existing DoD contracts are having on defense companies' ability to increase compensation for employees. As workforce challenges and the availability of talent are critical concerns for NDIA member companies, the *Vital Signs* 2023 survey included focused workforce questions. The results were unambiguous. **NDIA member companies reported significant challenges recruiting STEM and skilled trade workers and report equally significant challenges in competing with non-defense firms for talent.** A total of 82% of NDIA member respondents reported it was "somewhat difficult" or "very difficult" to find STEM workers and 64% reported it was "somewhat difficult" or "very difficult" to find skilled labor workers. In key skills such as engineers and software engineers, the DIB is in direct competition with the U.S. commercial sector, which has more flexibility to compete for workforce talent. In *Vital Signs 2023*, 80% of survey respondents reported it was "somewhat difficult" or "very difficult" to compete with non-defense firms for talent.

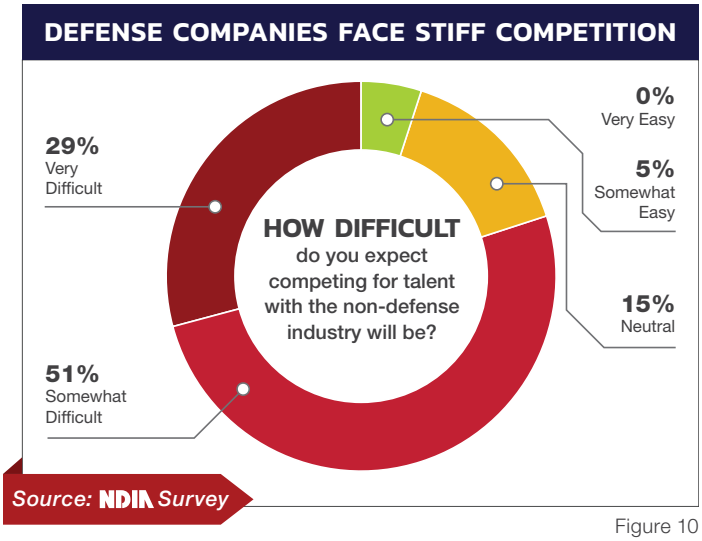


Figure 10

NEXT STEPS

NDIA member companies have been clear that the two most significant steps the executive and congressional branches can take to support the U.S. defense industrial base (DIB) are to streamline the acquisition process (34%) and to ensure budget stability (34%). The common reaction to these results is likely to either attempt to simplify the problem by pointing a finger at one or more of the federal branches of government or to accept that these concerns are enduring business challenges that need to be managed but cannot necessarily be solved. Neither response works when the U.S. is dealing with the re-emergence of great power competition. A third way is required: the government and private sector must adapt together to address these challenges.

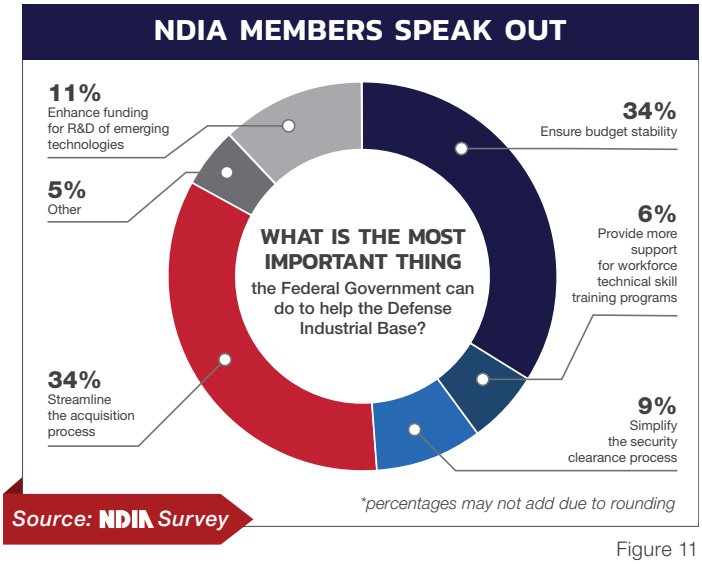


Figure 11

NDIA member companies reported in the *Vital Signs 2023* survey that over the next year 58% believed defense contracting business conditions would be about the same and 29% reported the business conditions would get worse. Put another way, 87% believed that despite the sense of urgency to re-posture the DIB to deter and – if needed – decisively prevail in peer conflict, nothing about their business environment is going to change.

NDIA believes change can happen. We will therefore spend the coming year working with our member companies, divisions, and chapters on priority policies that will support re-posturing the DIB to align it with national strategic objectives. In 2023, NDIA is committed to working on securing budget stability and sufficiency; advancing DoD digital modernization, facilitating foreign military sales modernization and technology integration; restoring industrial readiness, capacity, and infrastructure; and enabling more resilient supply chains. Our Emerging Technologies Institute will continue to lead on the best ways for government and industry to partner to integrate and scale operationally relevant emerging technology on relevant timelines for any potential per conflict. NDIA will integrate acquisition reform and workforce development as cross-cutting issues into each of the policy priorities the association tackles, and each policy area will integrate the best solutions for small businesses, middle-tier suppliers, and non-traditional defense companies.

U.S. industry is not currently postured to be resilient and reconstitute in a peer conflict. Strong defense industrial readiness – ensuring our fighters have everything they need so they never engage in a fair fight – is a key element of current national deterrence. If conflict ever erupted, national leaders will either have credible or constrained response options based on the investments to the DIB they inherit from this current generation of leaders serving in the executive branch, the congressional branch, and industry.

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