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**Department of Defense
Fiscal Year (FY) 2022 Budget Estimates**

May 2021



Office of the Secretary Of Defense
Defense-Wide Justification Book Volume 1 of 2
Defense Production Act Purchases

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Footnotes

FY 2020 Actuals

Includes Division A, Title IX and X of the Consolidated Appropriations Act, 2020 (P.L. 116-93), Division F, Title IV and V from the Further Consolidated Appropriations Act, 2020 (P.L. 116-94) and the Coronavirus Aid, Relief, and Economic Security Act (P.L. 116-136).

FY 2021 Enacted

Includes Division C, Title IX and Division J, Title IV of the Consolidated Appropriations Act, 2021 (P.L. 116-260).

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Defense-Wide
FY 2022 President's Budget
Exhibit P-1 FY 2022 President's Budget
Total Obligational Authority
(Dollars in Thousands)

04 May 2021

Appropriation -----	FY 2020 Actual*	FY 2021 Enacted**	FY 2022 Request
Defense Production Act Purchases	964,393	174,639	340,927
Total Defense-Wide	964,393	174,639	340,927

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Defense-Wide
FY 2022 President's Budget
Exhibit P-1 FY 2022 President's Budget
Total Obligational Authority
(Dollars in Thousands)

04 May 2021

Appropriation: Defense Production Act Purchases

Budget Activity -----	FY 2020 Actual*	FY 2021 Enacted**	FY 2022 Request
01. Defense Production Act Purchases	964,393	174,639	340,927
Total Defense Production Act Purchases	964,393	174,639	340,927

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Defense-Wide
 FY 2022 President's Budget
 Exhibit P-1 FY 2022 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

04 May 2021

Appropriation: 0360D Defense Production Act Purchases

Line No	Item Nomenclature	Ident Code	FY 2020 Actual*		FY 2021 Enacted**		FY 2022 Request		S e c
			Quantity	Cost	Quantity	Cost	Quantity	Cost	
Budget Activity 01: Defense Production Act Purchases									

Defense Production Act Purchases									
1	COVID19	A		900,000					U
2	Defense Production Act Purchases	A		64,393		174,639		340,927	U
Total Defense Production Act Purchases				964,393		174,639		340,927	
Total Defense Production Act Purchases				964,393		174,639		340,927	

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Appropriation 0360D: Defense Production Act Purchases

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Exhibit P-40, Budget Line Item Justification: PB 2022 Office of the Secretary Of Defense **Date:** May 2021

Appropriation / Budget Activity / Budget Sub Activity: 0360D: Defense Production Act Purchases / BA 01: Defense Production Act Purchases / BSA 10: Defense Production Act Purchases	P-1 Line Item Number / Title: TITLE3 / Defense Production Act Purchases
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ID Code (A=Service Ready, B=Not Service Ready):	Program Elements for Code B Items: 0902199D8Z	Other Related Program Elements: N/A
--	--	--

Line Item MDAP/MAIS Code: N/A

Resource Summary	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	To Complete	Total
Procurement Quantity (<i>Units in Each</i>)	-	-	-	-	-	-	-	-	-	-	-	-
Gross/Weapon System Cost (<i>\$ in Millions</i>)	231.041	64.393	174.639	340.927	-	340.927	-	-	-	-	-	-
Less PY Advance Procurement (<i>\$ in Millions</i>)	-	-	-	-	-	-	-	-	-	-	-	-
Net Procurement (P-1) (<i>\$ in Millions</i>)	231.041	64.393	174.639	340.927	-	340.927	-	-	-	-	-	-
Plus CY Advance Procurement (<i>\$ in Millions</i>)	-	-	-	-	-	-	-	-	-	-	-	-
Total Obligation Authority (<i>\$ in Millions</i>)	231.041	64.393	174.639	340.927	-	340.927	-	-	-	-	-	-

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (<i>\$ in Millions</i>)	-	-	-	-	-	-	-	-	-	-	-	-
Flyaway Unit Cost (<i>\$ in Millions</i>)	-	-	-	-	-	-	-	-	-	-	-	-
Gross/Weapon System Unit Cost (<i>\$ in Millions</i>)	-	-	-	-	-	-	-	-	-	-	-	-

Description:

Title III of the Defense Production Act (DPA) provides the President of the United States broad authorities to ensure the timely availability of domestic industrial base capabilities essential for the national defense. DPA Title III is an important DoD program with the authority to utilize economic incentives to create, maintain, protect, expand, or restore domestic sources for critical components, critical technology items, and industrial resources. The DPA is authorized by 50 U.S.C. Sections 4501-4568.

This budget includes a project portfolio that will appropriately utilize DPA Title III authorities to strengthen domestic industrial base capabilities essential to national defense. The multi-year projects in this budget will incentivize domestic sources to establish, strengthen, and expand domestic industrial base capabilities in key areas such as strategic radiation-hardened microelectronics and the rare earths supply chain.

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Line Item MDAP/MAIS Code: N/A

Exhibits Schedule					Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Exhibit Type	Title*	Subexhibits	ID CD	MDAP/MAIS Code	Quantity / Total Cost <i>(Each) / (\$ M)</i>	Quantity / Total Cost <i>(Each) / (\$ M)</i>	Quantity / Total Cost <i>(Each) / (\$ M)</i>	Quantity / Total Cost <i>(Each) / (\$ M)</i>	Quantity / Total Cost <i>(Each) / (\$ M)</i>	Quantity / Total Cost <i>(Each) / (\$ M)</i>
P-5	1 / Defense Production Act Purchases				- / 231.041	- / 64.393	- / 174.639	- / 340.927	- / -	- / 340.927
P-40	Total Gross/Weapon System Cost				- / 231.041	- / 64.393	- / 174.639	- / 340.927	- / -	- / 340.927

*Title represents 1) the Number / Title for Items; 2) the Number / Title [DODIC] for Ammunition; and/or 3) the Number / Title (Modification Type) for Modifications.

Note: Totals in this Exhibit P-40 set may not be exact or sum exactly due to rounding.

Justification:

Strategic overview:

DPA Title III investments are driven by strategy starting with the National Security Strategy and National Defense Strategy. DPA Title III investments are also supporting Department of Defense modernization priorities and the recommendations from the interagency report in response to Executive Order 13806: Assessing and Strengthening the Manufacturing and Defense Industrial Base and Supply Chain Resiliency of the United States (E.O. 13806).

The FY 2022 budget reflects the Department resourcing the DPA Fund so the DPA Title III Program can address critical shortfalls in the domestic industrial base, as identified in the interagency report in response to Executive Order 13086, and ensure the industrial base can support the Department's strategic modernization initiatives. The DPA Title III Program plans to conduct industrial base efforts to support critical areas such as, rare earths, critical chemicals, small unmanned aerial systems, hypersonic applications, electronics, and space. Specified numbers for each effort are estimates that are subject to change based on ongoing market research and the acquisition process.

Program Change Summary:

FY 2022: \$340.927 million

FY 2021: \$174.639 million

* Includes net Congressional reduction of -\$7.292 million

FY 2020: \$64.393 million

This budget includes essential transformational initiatives using the authorities of Title III of the DPA. Project descriptions are provided below for each projects, and the single or multi-year cost phasing of each of the projects is addressed in the P5 exhibit. As DPA Title III funds are non-expiring, the reported prior year funds column indicates all prior funds associated with that line of effort, which may or may not have already been obligated to contract. Any exceptions to this are called out in the project details. The prior year funds listed for "Program Administrative and Management Support" report all prior year funds utilized to support those efforts in FY 2021.

Project Descriptions:

National Security Space Industrial and Supply Base (NSS ISB):

-The National Security Space Industrial and Supply Base (NSS ISB) Risk Mitigation Program: Developed to formulate a systematic process to fund mitigation efforts to rectify shortfalls in the space industrial and supply base. The objective is to ensure access to critical technologies and capabilities in the quality, quantity, and timeframes required to support U.S. Government space programs. Projects in this program are

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ID Code (A=Service Ready, B=Not Service Ready):	Program Elements for Code B Items: 0902199D8Z	Other Related Program Elements: N/A
Line Item MDAP/MAIS Code: N/A		
<p>addressing cross-platform, multi-agency/Service requirements. Projects are developed in response to risk mitigation determinations and prioritized critical requirements of stakeholders in DoD and other agencies, as represented through the Department's Space Industrial Base Working Group.</p> <p>-NSS ISB – Space Qualified Solar Cell Supply Chain: The purpose of these projects is to ensure a domestic capability to supply this critical power supply component for national security space assets. Projects involve ensuring a viable domestic source for space qualified germanium substrates and high-performance photovoltaic cells, panels, and systems. Current projects are helping domestic photovoltaic manufacturing and integration companies maintain their performance lead over foreign competitors by expanding production of AIAA S-111 space-qualified photovoltaic solar cells with improved cost and performance efficiencies. Performance improvements include characterizing high-efficiency inverted metamorphic (IMM) solar cells grown on Gallium Arsenide substrates as a drop-in replacement for ZTJ triple-junction solar cells, and completing the qualification of the IMM solar cells to the AIAA S-111A standard. Other improvements on high-efficiency XTJ Prime triple-junction solar cells grown on Germanium substrates include increasing the cell Beginning-of-Life efficiency and reducing End-of-Life cost per watt. Multiple awards were made in FY 2019 and FY 2020 utilizing prior year funds. All but \$8 million of the reported funds has been awarded to contract, which is anticipated to award in FY 2021 utilizing prior year funds.</p> <p>-NSS ISB - Next Generation Reaction Wheel Assemblies (RWA): This project addresses a need for a multiple-phase Next-Generation scalable Reaction Wheel (NGRW) to provide a systematic comprehensive, low cost/risk investment affording potential for high return on investment. The goal is to generate or revive a domestic competitor, or to expand the existing vendor's product line, with a focus on smaller wheels using advanced technologies. In addition, the effort will explore encouraging a business partnership to maintain a second source in the U.S. Also, the project will investigate using another product controlled by a U.S. company. A study phase was completed, and the execution phase was awarded in FY 2020 utilizing prior year funds. Additional FY 2021 funds are anticipated to be applied to these efforts.</p> <p>-NSS ISB - Radiation-Hardened Digital/Analog Production & Qualification: This project funds work at the 45nm and 14nm nodes. It is imperative that government organizations responsible for national security, e.g., intelligence acquisition, missile early warning, missile defense, and other space requirements maintain a strong industrial base to supply technology necessary to design, develop, and fabricate secure, radiation hardened, high reliability, and DoD space qualified Application Specific Integrated Circuits (ASIC), Application Specific Standard Products (ASSP), such as very high speed data switches, and Multi-Core General Purpose Processors (MCGPP) at the 45nm technology node or smaller to support onboard processing and other critical applications. The objective of this project is to enhance the Radiation Hardened By Design flow, optimize selected circuit designs to reduce power and increase performance, and complete the design, fabrication, testing, and qualification of certain critical devices to include the MC-GPP. In addition to achieving an estimated improvement in performance of > 25% for power and performance for some specific designs, the proposed effort will support life-time acquisition buys of these critical circuits for some identified systems with attendant reductions in system technical, cost, and schedule risks. Awards were made toward this effort in FY 2019 and FY 2020 utilizing prior year funds. Additional projects are anticipated to be awarded in FY 2021 utilizing prior year, FY 2020, and FY 2021 funds.</p> <p>-NSS ISB – Access to Field Programmable Gate Arrays (FPGA) for Space Applications: The DoD and Intelligence Community have identified FPGAs as a critical enabling technology across a wide variety of present and future systems. Advanced, commercially available FPGAs are manufactured off-shore and are considered vulnerable to tampering and insertion of malicious software and/or hardware. This program seeks to improve the security posture and reduce the risk associated with FPGA technology by addressing security concerns in the design, development, fabrication, and supply lifecycle of FPGA devices. The objective of this program is to develop and demonstrate an approach to gain access to advanced, assured, and space qualified reprogrammable FPGA technology to support DoD/IC applications including satellite and strategic missile systems. Concerning this effort "assured" is defined as assurance of the integrity and availability, of a product wherein that product will reliably operate as intentionally designed and not contain any malicious hardware and/or software that will compromise the intended application; e.g., exfiltration of sensitive data, etc. A study phase was completed, and the execution phase is anticipated to be awarded in FY 2021 utilizing prior year, FY 2021, and FY 2022 funds.</p> <p>-NSS ISB – Fibers and Composites: These projects are intended to ensure the domestic industrial base can provide key qualified fibers and composites that are critical to NSS, such as rocket nozzle throats, light weight structures, and light-weight, resilient shielding and interconnects. Current items of interest include fibers, fabrics, and components made out of rayon, polyacrylonitrile (PAN), and carbon nanotubes. These efforts mitigate key risks factors such as reliance on foreign sources and very limited or no domestic suppliers.</p> <p>-NSS ISB - Infrared Sensor Substrates (Cadmium Zinc Telluride / Mercury Cadmium Telluride): The purpose of this effort is to establish and maintain a high quality production capability for Mercury Cadmium Telluride (MCT) epitaxy grown on Cadmium Zinc Telluride (CZT) substrates via molecular beam epitaxy (MBE) at key US-owned and operated foundries in order to assure the necessary supply of infrared focal plane arrays (IRFPAs) to National Security Space (NSS) agencies when needed. The primary goal is ensure domestic availability of these detectors, and demonstrate on-shore MCT detectors are equivalent in performance to IRFPAs utilizing off-shore substrates. Additional awards were made toward this effort in FY 2019 and FY 2020 utilizing prior year funds and FY2020 funds. Further efforts are anticipated in FY 2021 utilizing FY 2021 funds.</p>		

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Line Item MDAP/MAIS Code: N/A		
<p>-NSS ISB – ROIC Foundry Improvement and Sustainment: This project is a follow-on to a prior read-out integrated circuit (ROIC) project that focused on maintaining minimal, yet adequate, production capabilities at domestic foundries to ensure a necessary supply of strategic ROICs for Government space programs while simultaneously improving product design and processes.</p> <p>-NSS ISB - Next-Generation Star Trackers System: This project is a follow-on to the prior Next Generation Star Tracker System (NGSTS) that uses advanced domestically-produced Complementary Metal Oxide Semiconductor (CMOS) detectors with a capability that meets the specifications of the DPA Title III Advanced CMOS Capability Project. This involves adherence to the Staring Technology for Enhanced Linear Line-of-site Angular Recognition (STELLAR) specification. A NGSTS with CMOS technology is needed to meet military and civil US Government (including National Security Space) and commercial market demands for the foreseeable future and will reassert the viability and competitiveness of the domestic industrial base. This project is anticipated to be awarded in FY2021 utilizing FY 2021 and prior year funds.</p> <p>Industrial Base Risk Mitigation Projects (non-NSS ISB):</p> <p>-Strategic Radiation Hardened Trusted Microelectronics: The purpose of this effort is to provide assured capabilities to produce or acquire strategic radiation hardened (SRH) trusted microelectronics in compliance with Department of Defense instruction 5200.44 to supply critical microelectronic components for necessary radiation environments involved with the acquisition of delivery systems for nuclear weapons. The first set of projects provide production, engineering, and sustainment services in support of SRH microelectronics fabrication via a Defense Microelectronics Activity (DMEA)-accredited Trusted Supplier using a Trusted flow. Multiple contracts have been awarded toward this effort in FY 2019 and FY 2020 utilizing FY 2018, FY 2019, and FY 2020 funds. Further efforts are being developed to execute in FY 2021 and FY 2022 to ensure the sustainment and advancement of this critical industrial capability, currently estimated to utilize \$14.5M of FY 2019 funds, \$23.4M of FY2020 funds, and \$20M of FY2021 funds. Another effort will fund the production and modernization of high voltage, analog, SRH qualified electronics. Additionally, partially depleted silicon-on-insulator (PDSOI) semiconductors (SCs) are the only option for use in nuclear modernization systems (GBSD, LRSO, etc.), which require radiation hardened microelectronics (nuclear modernization is DoD's #1 priority); PDSOI is also the most advanced space qualified Complementary Metal-Oxide Semiconductor (CMOS) technology to date. The planned DPA investments over the next 2-3 years is to expand/qualify a new source for use in space and non-nuclear systems.</p> <p>-Critical Chemicals for DoD Missiles and Munitions: Multiple efforts are being scoped to address critical shortfalls in the domestic industrial capability to produce materials for DoD missiles and munitions. In January 2019, the President signed four Presidential Determinations addressing vulnerabilities in the supply chain for critical chemicals for DoD munitions, including: precursor materials, inert materials, energetic materials, and advanced manufacturing techniques for producing the materials. Relying on foreign sources, especially China, for these critical chemicals poses a risk to the Department's readiness to deter and defeat adversaries. Efforts to qualify a second source for ammonium perchlorate were undertaken in FY2020 utilizing FY 2020 and prior year funds, and multiple projects are anticipated to be awarded in FY 2021 and FY 2022 utilizing FY 2021 and FY 2022 funds. The current priority for the DPA Title III program is to onshore the top ten mission critical chemicals currently produced overseas as well as modernize the Defense Industrial Base for chemicals from the WWII era manufacturing to a more flexible, more versatile industrial base that can pivot quickly to meet new demands.</p> <p>-Rare Earth Supply Chain: In July 2019, the President signed 5 Presidential Determinations addressing the rare earth elements supply chain, including: Light Rare Earth Separation and Processing, Heavy Rare Earth Separation and Processing, Production of Rare Earth Metals and Alloys, Production of Neodymium Iron Boron Rare Earth Permanent Magnets, and Production of Samarium Cobalt Rare Earth Permanent Magnets. This line of effort will establish a domestic industrial capability to support key aspects of the rare earth supply chain. China dominates the Rare Earth Elements (REE) market on a global scale in both mining and processing of RE raw materials and has the ability to manipulate global markets. Relying on foreign sources for these critical materials poses a risk to the DoD's readiness to deter and defeat adversaries. Important defense applications for the end product of this supply chain, REE permanent magnets, include jet fighter engines, missile guidance systems, antimissile defense, space-based satellites, and communication systems. Efforts are currently being developed to bolster the domestic industrial base to support the separation and processing of rare earth elements and domestic production capability for Neodymium Iron Boron (NdFeB) rare earth permanent magnets. Multiple projects have awarded in FY 2020 utilizing prior year funds. Additional efforts are being developed and anticipated to utilize FY 2021 and 2022 funds.</p> <p>-Hypersonics Industrial Base: The DPA Title III program is actively working with stakeholders to identify gaps in the industrial capability to produce components for hypersonic systems and scale production from prototype levels to the required capacity. In FY 2020, the President authorized the use of the DPA Title III authorities to execute industrial base projects that support high/ultra-high temperature composites for hypersonic, strategic missile and launch systems. Projects are anticipated to be executed in FY 2021 utilizing FY 2021, FY 2022 and prior year funds.</p>		

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<p>-Space Industrial Base: The DPA Title III program is actively working with stakeholders to identify gaps in the National Security Space industrial supply base. Projects are anticipated to be executed in FY 2022 utilizing FY 2022 funds.</p> <p>-Assured Electronics Supply: The challenges facing the electronics industrial base are wide-reaching and significant. Commercial industry has trended toward yearly product refreshes and updating technology nodes frequently, leaving legacy DoD systems that must be maintained for decades with severe obsolescence issues. On the opposite end of the spectrum, new systems that desire to integrate the newest technologies face challenges obtaining assured and/or trusted supply as much of the electronics manufacturing supply chain has gone overseas. In addition, domestic suppliers that exist are reluctant to work with unique DoD requirements as it would negatively affect their commercial runs and overall business viability. The DPA Title III Program, in concert with its stakeholders, is working to identify and vet efforts to serve DoD's need for electronic materials, digital/analog/mixed signal integrated circuits, discrete components, displays, power electronic components, electro-optical/IR components, radio frequency components, advanced packaging, and other cross-cutting technologies. Should the President authorize the use of DPA Title III authorities, projects are anticipated to use FY 2021 and FY 2022 funds.</p> <p>-Small Unmanned Aerial Systems (sUAS): In June 2019, the President issued a Presidential Determination authorizing the use DPA Title III to strengthen the domestic industrial base for sUAS. The sUAS domestic industrial base has struggled to compete commercially in the midst of dominant foreign competition and DPA Title III is currently assessing where investments would best remedy the domestic industrial base shortfall and result in an economically viable domestic supplier. The DPA Title III program is working with stakeholders across USG to determine an appropriate investment strategy to enable the domestic industrial base to meet requirements. Projects are anticipated to be awarded in FY 2021 utilizing FY 2021 funds, with additional funding and projects to continue into FY 2022.</p> <p>-Next Generation Soldier Protection: The purpose of this project is to create a manufacturing capacity to produce lightweight, high-strength, inherently fire-resistant co-polymer aramid fibers to provide lightweight force protection for Soldiers and air, ground, and naval platforms and bases. Examples include lighter and stronger body armor, helmets, pelvic protection, enhanced combat vehicle survivability, enhanced aviation platform survivability, and integrated base protection. A next generation of co-polymer aramid fibers would provide a step-change increase in tenacity over existing fibers, a key attribute for enabling lighter-weight ballistic protection. This project was awarded in FY 2019 utilizing prior year funds. Additional funding was applied to this contract in FY 2020 utilizing FY 2020 funds and FY 2021 funds are anticipated to be applied to this effort in FY 2021.</p> <p>-AN-SSQ Series Sonobuoys Production Capability: The purpose of this effort is to ensure the availability of qualified AN/SSQ-101B sonobuoys. The domestic industrial base for AN/SSQ series sonobuoys was deemed at risk of not being able to produce the needed classes and quantities of sonobuoys and would require assistance to establish the required production lines. This project is anticipated to be awarded in FY 2021 utilizing FY 2021 and prior year funds.</p> <p>-Three-Dimensional (3D) Microelectronics for Information Protection: The purpose of this effort is to establish a domestic, merchant supplier manufacturing capability to provide two- and three-dimensional high density packaging technology, which accepts a wide range of custom and commercial-off-the-shelf components that can drastically increase the security of DoD platforms. This DPA Title III effort is working to create a low rate initial production capability of the packaging technology to enable the early DoD adopters to reliably procure products and achieve cost savings for their programs. The contract for this project was awarded in March 2018, and a second phase of this effort was awarded in FY 2021 utilizing prior year funds.</p> <p>-Activated Carbon Capacity Expansion: The objective this project is to expand domestic production capacity of activated carbon, which is used by the DoD to protect against many Chemical, Biological, Radiological, and Nuclear (CBRN) agents that could be used during acts of war or terrorism. Copper-silver-zinc-molybdenum-triethylenediamine (ASZM-TEDA) impregnated activated carbon is the only grade of carbon deemed acceptable by the DoD for collective and personal CBRN protection systems and devices.</p> <p>-COVID-19 Response: Early in the COVID-19 pandemic, DPA Title III aligned and executed \$40.3 million of FY 2020 and prior year funds to respond to the pandemic. Efforts included supporting critical aircraft engine (\$25 million), soldier body armor (\$15 million), and ventilator (\$0.3 million) production capabilities.</p> <p>The following projects that were reported in PB21 have been pulled out of the exhibit as they have been fully obligated as of the end of FY 2020 and only utilized prior year funds.</p> <p>Secure Composite Shipping Containers Production Capacity: Developed under funding from the Department of Homeland Security (DHS) Advanced Research Projects Agency (HSARPA), the Secure Hybrid Composite Container (SHCC) is an intermodal ISO shipping container providing advanced security features, while meeting all the operational, structural, and customs requirements of standard steel 20ft and 40ft shipping containers. The container includes the capability to be tracked during its shipment and alert officials to track deviations and alarms. The ultimate goal of the container is to provide the level of security to</p>		

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ID Code (A=Service Ready, B=Not Service Ready):	Program Elements for Code B Items: 0902199D8Z	Other Related Program Elements: N/A
Line Item MDAP/MAIS Code: N/A		
<p>law enforcement officials to ensure contraband products and malicious agents have not been inserted into the container for smuggling into the US. Investment under Title III to establish initial production capability for the secure hybrid composite container can help satisfy an estimated 3,000 container per year initial government need from the Department of Defense, Department of State, and the Intelligence Community agencies requiring secure shipping containers. A production line with an output of approximately 100 containers per year output is planned. This project was awarded in FY 2019 and the remaining funding was applied in FY 2020. Total project funding amounted to \$16.8 million of prior year funds.</p> <p>High Purity Beryllium: The purpose of this project is to ensure the availability of high purity Beryllium metal for DoD and national security requirements through capital improvements to an existing sole source supplier. Beryllium, a light weight metal, possesses unique properties that make it indispensable in many of today's critical defense systems. High purity beryllium is used extensively in structures, digital electronics, and instruments found in defense weapon systems where stiffness, low weight, good thermal conductivity, and dimensional stability are required. Defense demand for beryllium generally includes the following four areas: sensors, missile and satellite applications, avionics, and nuclear weapons managed by the Department of Energy. This project is a follow-on to a previous DPA Title III project from 2005 to 2012 which established the domestic production capability for primary High Purity Beryllium metal through the design and implementation of a facility. The current project will implement capital improvements required to gain production efficiencies at the facility constructed by the previous effort. This project was awarded in FY 2019 utilizing \$11.77 million of prior year funds.</p> <p>Shielded Infrastructures: The purpose of this project is to further increase the production capacity of conductive composite nanomaterials to meet emerging DoD requirements for light weight, unique form factor, electromagnetically shielded products. It is anticipated to leverage the success of a prior DPA Title III project by integrating and scaling the technology (chemical vapor deposited nickel coated nano-materials) into other novel applications such as non-metallic enclosures, cases, laminates, injection moldings, wallpapers, paints, windows, etc. This project was awarded in FY 2020 utilizing \$6.8 million of prior year funds.</p> <p>Lithium Sea-Water Batteries: The purpose of this project is to establish the domestic production capability for Lithium Sea-Water (Li-SW) batteries. Currently, no commercially available battery technology has been tested to meet the energy-density, performance, and environment requirements needed to enable the Next Generation Airborne Passive Sensor (NGAPS) sonobuoys. The Office of Naval Research has conducted research and proven that Li-SW batteries will be able to meet the NGAPS requirements if manufactured in the required form factor. The need exists to establish a production line for Li-SW batteries, and to maintain affordable unit prices to support the DoD's needs. This project was awarded in FY 2020 utilizing \$10 million of prior year funds.</p> <p>Thin Wall Castings for Military Applications: Domestic foundries prefer to prioritize high volume, low-risk commercial work over low volume, high-risk defense work. This environment has led to a reduced number of suppliers qualified to provide large, aerospace-grade castings, limited investment in new technologies, and increased cost and lead-times for defense aerospace-related casting products. The objective of this project is to sustain and expand economically viable, merchant suppliers for large, complex, thin-walled aerospace grade magnesium and aluminum sand casting products for rotorcraft platforms, such as the CH-53K. This project was awarded in FY 2020 utilizing \$15.759 million of prior year funds.</p> <p>F135 Integrally Bladed Rotors (IBR): The purpose of this effort is to expediently restore the domestic production capacity for 2nd and 3rd stage integrally bladed rotors (IBRs) for the F135 engine to minimize impact on the F-35 Joint Strike Fighter (JSF) delivery schedule. This effort mitigates the loss of a qualified source in the F135 engine's global supply chain. This project was awarded in FY 2019 utilizing FY 2019 funds.</p>		

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Exhibit P-5, Cost Analysis: PB 2022 Office of the Secretary Of Defense		Date: May 2021
Appropriation / Budget Activity / Budget Sub Activity: 0360D / 01 / 10	P-1 Line Item Number / Title: TITLE3 / Defense Production Act Purchases	Item Number / Title [DODIC]: 1 / Defense Production Act Purchases

ID Code (A=Service Ready, B=Not Service Ready) :	MDAP/MAIS Code:
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Resource Summary	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Procurement Quantity (Units in Each)	-	-	-	-	-	-
Gross/Weapon System Cost (\$ in Millions)	231.041	64.393	174.639	340.927	-	340.927
Less PY Advance Procurement (\$ in Millions)	-	-	-	-	-	-
Net Procurement (P-1) (\$ in Millions)	231.041	64.393	174.639	340.927	-	340.927
Plus CY Advance Procurement (\$ in Millions)	-	-	-	-	-	-
Total Obligation Authority (\$ in Millions)	231.041	64.393	174.639	340.927	-	340.927

(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)

Initial Spares (\$ in Millions)	-	-	-	-	-	-
Gross/Weapon System Unit Cost (\$ in Millions)	-	-	-	-	-	-

Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2020			FY 2021			FY 2022 Base			FY 2022 OCO			FY 2022 Total		
	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)

Hardware - National Security Space (NSS) Industrial & Supply Base (ISB) Risk Mitigation Program Cost																		
Non Recurring Cost																		
NSS ISB: Space Qualified Solar Cell Supply Chain	-	-	28.840	-	-	0.000	-	-	0.000	-	-	0.000	-	-	-	-	-	0.000
NSS ISB: Next Generation Reaction Wheels Assembly	-	-	4.044	-	-	0.000	-	-	1.667	-	-	0.000	-	-	-	-	-	0.000
NSS ISB: Radiation-Hardened Digital/ Analog Production & Qualification	-	-	14.950	-	-	0.000	-	-	7.500	-	-	5.000	-	-	-	-	-	5.000
NSS ISB: Field-Programmable Gate Arrays (FPGA) for Space Applications	-	-	6.906	-	-	0.000	-	-	4.501	-	-	2.733	-	-	-	-	-	2.733
NSS ISB: Fibers and Composites	-	-	0.000	-	-	0.000	-	-	2.800	-	-	0.000	-	-	-	-	-	0.000
NSS ISB: Infrared Sensor Substrates (Cadmium Zinc Telluride / Mercury Cadmium Telluride)	-	-	23.779	-	-	4.000	-	-	2.000	-	-	2.000	-	-	-	-	-	2.000
NSS ISB: ROIC Foundry Improvement and Sustainment	-	-	0.620	-	-	0.975	-	-	0.945	-	-	0.000	-	-	-	-	-	0.000

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Appropriation / Budget Activity / Budget Sub Activity: 0360D / 01 / 10						P-1 Line Item Number / Title: TITLE3 / Defense Production Act Purchases						Item Number / Title [DODIC]: 1 / Defense Production Act Purchases					

ID Code (A=Service Ready, B=Not Service Ready) :										MDAP/MAIS Code:							
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Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2020			FY 2021			FY 2022 Base			FY 2022 OCO			FY 2022 Total		
	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)
NSS ISB: Next Generation Star Trackers	-	-	2.835	-	-	0.000	-	-	0.000	-	-	0.000	-	-	-	-	-	0.000
<i>Subtotal: Non Recurring Cost</i>	-	-	81.974	-	-	4.975	-	-	19.413	-	-	9.733	-	-	-	-	-	9.733
<i>Subtotal: Hardware - National Security Space (NSS) Industrial & Supply Base (ISB) Risk Mitigation Program Cost</i>	-	-	81.974	-	-	4.975	-	-	19.413	-	-	9.733	-	-	-	-	-	9.733
Hardware - Industrial Base Risk Mitigation Cost																		
Recurring Cost																		
Program Management and Administrative Support	-	-	14.185	-	-	5.838	-	-	19.838	-	-	19.500	-	-	-	-	-	19.500
<i>Subtotal: Recurring Cost</i>	-	-	14.185	-	-	5.838	-	-	19.838	-	-	19.500	-	-	-	-	-	19.500
Non Recurring Cost																		
Strategic Radiation Hardened Trusted Microelectronics Foundry	-	-	37.161	-	-	13.461	-	-	23.400	-	-	140.000	-	-	-	-	-	140.000
Critical Chemical for DoD Munitions	-	-	0.329	-	-	0.139	-	-	13.379	-	-	35.000	-	-	-	-	-	35.000
Rare Earth Supply Chain	-	-	43.400	-	-	0.000	-	-	32.000	-	-	32.000	-	-	-	-	-	32.000
Hypersonics Industrial Base	-	-	1.223	-	-	0.000	-	-	23.777	-	-	38.000	-	-	-	-	-	38.000
Space Industrial Base	-	-	-	-	-	-	-	-	-	-	-	24.352	-	-	-	-	-	24.352
Assured Electronics Supply	-	-	-	-	-	-	-	-	18.000	-	-	27.342	-	-	-	-	-	27.342
Small Unmanned Aerial Systems	-	-	-	-	-	0.000	-	-	14.000	-	-	15.000	-	-	-	-	-	15.000
Next Generation Soldier Protection	-	-	22.848	-	-	12.452	-	-	4.700	-	-	0.000	-	-	-	-	-	0.000
AN-SSQ Series Sonobuoys Production Capability	-	-	4.000	-	-	0.000	-	-	3.966	-	-	0.000	-	-	-	-	-	0.000
3D Microelectronics for Information Protection	-	-	10.000	-	-	0.000	-	-	0.000	-	-	0.000	-	-	-	-	-	0.000
Activated Carbon Capacity Expansion	-	-	3.134	-	-	-	-	-	2.166	-	-	-	-	-	-	-	-	-

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Appropriation / Budget Activity / Budget Sub Activity: 0360D / 01 / 10						P-1 Line Item Number / Title: TITLE3 / Defense Production Act Purchases						Item Number / Title [DODIC]: 1 / Defense Production Act Purchases					
ID Code (A=Service Ready, B=Not Service Ready) :												MDAP/MAIS Code:					

Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding.

Cost Elements	Prior Years			FY 2020			FY 2021			FY 2022 Base			FY 2022 OCO			FY 2022 Total		
	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)	Unit Cost (\$ M)	Qty (Each)	Total Cost (\$ M)
COVID-19 Response	-	-	12.787	-	-	27.528	-	-	0.000	-	-	0.000	-	-	-	-	-	0.000
<i>Subtotal: Non Recurring Cost</i>	-	-	134.882	-	-	53.580	-	-	135.388	-	-	311.694	-	-	-	-	-	311.694
<i>Subtotal: Hardware - Industrial Base Risk Mitigation Cost</i>	-	-	149.067	-	-	59.418	-	-	155.226	-	-	331.194	-	-	-	-	-	331.194
Gross/Weapon System Cost	-	-	231.041	-	-	64.393	-	-	174.639	-	-	340.927	-	-	-	-	-	340.927

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