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**Department of Defense
Fiscal Year (FY) 2019 Budget Estimates**

February 2018



Office of the Secretary Of Defense

Defense-Wide Justification Book Volume 1 of 2

Defense Production Act Purchases

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Defense-Wide
FY 2019 President's Budget
Exhibit P-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

02 Feb 2018

| Appropriation | FY 2017 (Base + OCO) | FY 2018 PB Request with CR Adj Base | FY 2018 Total PB Requests* with CR Adj Base | FY 2018 PB Request with CR Adj OCO |
|----------------------------------|-------------------------|--|---|---|
| ----- | ----- | ----- | ----- | ----- |
| Defense Production Act Purchases | 109,091 | 63,630 | 63,630 | |
| Total Defense-Wide | 109,091 | 63,630 | 63,630 | |

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Defense-Wide
FY 2019 President's Budget
Exhibit P-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

02 Feb 2018

| Appropriation | FY 2018 Total PB Requests+ with CR Adj OCO | FY 2018 Emergency Requests** Emergency | FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req Emergency |
|----------------------------------|--|---|---|---------------------------------------|
| ----- | ----- | ----- | ----- | ----- |
| Defense Production Act Purchases | | | | |
| Total Defense-Wide | | | | |

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Defense-Wide
FY 2019 President's Budget
Exhibit P-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

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| Appropriation | FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency** | FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req with CR Adj Base + OCO + Emergency |
|----------------------------------|--|---|--|
| ----- | ----- | ----- | ----- |
| Defense Production Act Purchases | 63,630 | | 63,630 |
| Total Defense-Wide | 63,630 | | 63,630 |

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Defense-Wide
FY 2019 President's Budget
Exhibit P-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

02 Feb 2018

| Appropriation | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
|----------------------------------|-----------------|----------------|------------------|
| Defense Production Act Purchases | 38,578 | | 38,578 |
| Total Defense-Wide | 38,578 | | 38,578 |

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Defense-Wide
FY 2019 President's Budget
Exhibit P-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

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Appropriation: Defense Production Act Purchases

| Budget Activity | FY 2017 (Base + OCO) | FY 2018 PB Request with CR Adj Base | FY 2018 Total PB Requests* with CR Adj Base | FY 2018 PB Request with CR Adj OCO |
|--|-------------------------|--|---|---|
| 01. Defense Production Act Purchases | 109,091 | 37,401 | 37,401 | |
| 20. Undistributed | | 26,229 | 26,229 | |
| Total Defense Production Act Purchases | 109,091 | 63,630 | 63,630 | |

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FY 2019 President's Budget
Exhibit P-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

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Appropriation: Defense Production Act Purchases

| Budget Activity ----- | FY 2018 Total PB Requests+ with CR Adj OCO ----- | FY 2018 Emergency Requests** Emergency ----- | FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs ----- | FY 2018 Remaining Req Emergency ----- |
|--|---|--|--|--|
| 01. Defense Production Act Purchases | | | | |
| 20. Undistributed | | | | |
| Total Defense Production Act Purchases | | | | |

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FY 2019 President's Budget
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Total Obligational Authority
(Dollars in Thousands)

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Appropriation: Defense Production Act Purchases

| Budget Activity | FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency** | FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs | FY 2018 Remaining Req with CR Adj Base + OCO + Emergency |
|--|--|---|--|
| 01. Defense Production Act Purchases | 37,401 | | 37,401 |
| 20. Undistributed | 26,229 | | 26,229 |
| Total Defense Production Act Purchases | 63,630 | | 63,630 |

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FY 2019 President's Budget
Exhibit P-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

02 Feb 2018

Appropriation: Defense Production Act Purchases

| Budget Activity ----- | FY 2019 Base ----- | FY 2019 OCO ----- | FY 2019 Total ----- |
|--|--------------------------|-------------------------|---------------------------|
| 01. Defense Production Act Purchases | 38,578 | | 38,578 |
| 20. Undistributed | | | |
| Total Defense Production Act Purchases | 38,578 | | 38,578 |

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Defense-Wide
 FY 2019 President's Budget
 Exhibit P-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

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Appropriation: 0360D Defense Production Act Purchases

| Line No | Item Nomenclature | Ident Code | FY 2017 (Base + OCO) | | FY 2018 PB Request with CR Adj Base | | FY 2018 Total PB Requests* with CR Adj Base | | FY 2018 PB Request with CR Adj OCO | | S e c |
|--|------------------------------------|---------------|-------------------------|------|--|------|---|------|---|------|-------------|
| | | | Quantity | Cost | Quantity | Cost | Quantity | Cost | Quantity | Cost | |
| Budget Activity 01: Defense Production Act Purchases | | | | | | | | | | | |
| Defense Production Act Purchases | | | | | | | | | | | |
| 1 | Defense Production Act Purchases | A | 109,091 | | 37,401 | | 37,401 | | | | U |
| Total Defense Production Act Purchases | | | 109,091 | | 37,401 | | 37,401 | | | | |
| Budget Activity 20: Undistributed | | | | | | | | | | | |
| Undistributed | | | | | | | | | | | |
| 2 | Adj to Match Continuing Resolution | A | | | 26,229 | | 26,229 | | | | U |
| Total Undistributed | | | | | 26,229 | | 26,229 | | | | |
| Total Defense Production Act Purchases | | | 109,091 | | 63,630 | | 63,630 | | | | |

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 FY 2019 President's Budget
 Exhibit P-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

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Appropriation: 0360D Defense Production Act Purchases

| Line No | Item Nomenclature | Ident Code | FY 2018 Total PB Requests+ with CR Adj OCO | | FY 2018 Emergency Requests** Emergency | | FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs | | FY 2018 Remaining Req Emergency | | S e c - |
|--|------------------------------------|---------------|--|------|---|------|---|------|---------------------------------------|------|------------------|
| | | | Quantity | Cost | Quantity | Cost | Quantity | Cost | Quantity | Cost | |
| Budget Activity 01: Defense Production Act Purchases | | | | | | | | | | | |
| Defense Production Act Purchases | | | | | | | | | | | |
| 1 | Defense Production Act Purchases | A | | | | | | | | | U |
| Total Defense Production Act Purchases | | | | | | | | | | | |
| Budget Activity 20: Undistributed | | | | | | | | | | | |
| Undistributed | | | | | | | | | | | |
| 2 | Adj to Match Continuing Resolution | A | | | | | | | | | U |
| Total Undistributed | | | | | | | | | | | |
| Total Defense Production Act Purchases | | | | | | | | | | | |

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 Exhibit P-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

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Appropriation: 0360D Defense Production Act Purchases

| Line No | Item Nomenclature | Ident Code | FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency** | | FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs | | FY 2018 Remaining Req with CR Adj Base + OCO + Emergency | | S e c | |
|--|------------------------------------|---------------|--|--------|---|------|--|--------|-------------|--|
| | | | Quantity | Cost | Quantity | Cost | Quantity | Cost | | |
| Budget Activity 01: Defense Production Act Purchases | | | | | | | | | | |
| Defense Production Act Purchases | | | | | | | | | | |
| 1 | Defense Production Act Purchases | A | | 37,401 | | | | 37,401 | U | |
| Total Defense Production Act Purchases | | | | 37,401 | | | | 37,401 | | |
| Budget Activity 20: Undistributed | | | | | | | | | | |
| Undistributed | | | | | | | | | | |
| 2 | Adj to Match Continuing Resolution | A | | 26,229 | | | | 26,229 | U | |
| Total Undistributed | | | | 26,229 | | | | 26,229 | | |
| Total Defense Production Act Purchases | | | | 63,630 | | | | 63,630 | | |

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 FY 2019 President's Budget
 Exhibit P-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

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Appropriation: 0360D Defense Production Act Purchases

| Line No | Item Nomenclature | Ident Code | FY 2019 Base Quantity | Cost | FY 2019 OCO Quantity | Cost | FY 2019 Total Quantity | Cost | S e c |
|--|------------------------------------|---------------|-----------------------------|------|----------------------------|------|------------------------------|------|-------------|
| Budget Activity 01: Defense Production Act Purchases | | | | | | | | | |
| Defense Production Act Purchases | | | | | | | | | |
| 1 | Defense Production Act Purchases | A | 38,578 | | | | 38,578 | | U |
| Total Defense Production Act Purchases | | | 38,578 | | | | 38,578 | | |
| Budget Activity 20: Undistributed | | | | | | | | | |
| Undistributed | | | | | | | | | |
| 2 | Adj to Match Continuing Resolution | A | | | | | | | U |
| Total Undistributed | | | | | | | | | |
| Total Defense Production Act Purchases | | | 38,578 | | | | 38,578 | | |

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Appropriation 0360D: Defense Production Act Purchases

| Line # | BA | BSA | Line Item Number | Line Item Title | Page |
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| Line Item Title | Line Item Number | Line # | BA | BSA | Page |
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| Defense Production Act Purchases | Title3 | 1 | 01 | 10..... | Volume 1 - 1 |

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|--|--------------------|----------------|----------------|--|--------------------|----------------------|---|--|----------------|----------------------------|--------------------|-------------------|
| Exhibit P-40, Budget Line Item Justification: PB 2019 Office of the Secretary Of Defense | | | | | | | | | | Date: February 2018 | | |
| 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 | | | | | |
| 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 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total | FY 2020 | FY 2021 | FY 2022 | FY 2023 | To Complete | Total |
| Procurement Quantity (<i>Units in Each</i>) | - | - | - | - | - | - | - | - | - | - | - | - |
| Gross/Weapon System Cost (<i>\$ in Millions</i>) | 1,771.955 | 109.091 | 37.401 | 38.578 | - | 38.578 | 35.683 | 36.033 | 30.628 | 31.223 | Continuing | Continuing |
| Less PY Advance Procurement (<i>\$ in Millions</i>) | - | - | - | - | - | - | - | - | - | - | - | - |
| Net Procurement (P-1) (<i>\$ in Millions</i>) | 1,771.955 | 109.091 | 37.401 | 38.578 | - | 38.578 | 35.683 | 36.033 | 30.628 | 31.223 | Continuing | Continuing |
| Plus CY Advance Procurement (<i>\$ in Millions</i>) | - | - | - | - | - | - | - | - | - | - | - | - |
| Total Obligation Authority (<i>\$ in Millions</i>) | 1,771.955 | 109.091 | 37.401 | 38.578 | - | 38.578 | 35.683 | 36.033 | 30.628 | 31.223 | Continuing | Continuing |
| <i>(The following Resource Summary rows are for informational purposes only. The corresponding budget requests are documented elsewhere.)</i> | | | | | | | | | | | | |
| Initial Spares (<i>\$ in Millions</i>) | - | - | - | - | - | - | - | - | - | - | - | - |
| Flyaway Unit Cost (<i>\$ in Millions</i>) | - | - | - | - | - | - | - | - | - | - | - | - |
| Gross/Weapon System Unit Cost (<i>\$ in Millions</i>) | - | - | - | - | - | - | - | - | - | - | - | - |
| <p>Description:</p> <p>Title III of the Defense Production Act (DPA) provides the Department of Defense (DoD) with a powerful tool to ensure the timely creation and availability of domestic production capabilities for technologies that have the potential for wide-ranging impact on the operational capabilities and technological superiority of United States (U.S.) defense systems. DPA Title III is unique in that it is the sole DoD program focused on creating, maintaining, protecting, and expanding or restoring domestic production capacity to strengthen domestic industry and to establish the industrial base capacity for essential national defense capabilities.</p> <p>The Defense Production Act is authorized by 50 U.S.C. Sections 4501-4568. This budget includes essential transformational initiatives using the authorities of Title III of the DPA. The multi-year projects in this budget will incentivize domestic sources to establish, strengthen, and expand domestic industrial base capabilities for key technologies that support transformational initiatives and maintain the technological superiority of U.S. defense systems.</p> <p>In accordance with the provisions of the Defense Production Act of 1950, as amended, (50 U.S.C. Sections 4501-4568), notification to Congress of the intent of the DoD to execute any of the projects described in this exhibit to correct domestic industrial base shortfalls for technologies and/or materials essential for the execution of the national security strategy of the U.S. will be provided via letter notification before the referenced projects are initiated.</p> | | | | | | | | | | | | |

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| Exhibit P-40, Budget Line Item Justification: PB 2019 Office of the Secretary Of Defense | | | | | | | | Date: February 2018 | | |
|---|---------------------------------------|-------------|-------|--|--|---|--|--|--|--|
| 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 | | | | |
| 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 | | | | | | | | | | |
| Exhibits Schedule | | | | | Prior Years | FY 2017 | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
| Exhibit Type | Title* | Subexhibits | ID CD | MDAP/MAIS Code | Quantity / Total Cost (Each) / (\$ M) | Quantity / Total Cost (Each) / (\$ M) | Quantity / Total Cost (Each) / (\$ M) | Quantity / Total Cost (Each) / (\$ M) | Quantity / Total Cost (Each) / (\$ M) | Quantity / Total Cost (Each) / (\$ M) |
| P-5 | 1 / Defense Production Act Purchases | | | | - / 1,771.955 | - / 109.091 | - / 37.401 | - / 38.578 | - / - | - / 38.578 |
| P-40 | Total Gross/Weapon System Cost | | | | - / 1,771.955 | - / 109.091 | - / 37.401 | - / 38.578 | - / - | - / 38.578 |
| <small>*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.</small> | | | | | | | | | | |

Justification:
Strategic overview:

DPA Title III investments for DoD are informed by the Department's key investment strategy documents including the Quadrennial Defense Review (QDR) and the Long Range Research and Development Plan (LRRDP). Investments for DoD will enable the production of capacity for technologies and materials emerging from the technology base when the private sector is unable to respond within DoD timelines. Technology focus areas include space, undersea, air dominance, strike, missile defense, and emerging technologies.

The National Security Space Industrial and Supply Base (NSS ISB) Risk Mitigation Program was developed by the DoD to formulate a systematic process to fund mitigation efforts to rectify shortcomings 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 addressing cross-platform, multi-agency/Service requirements. Projects are developed in response to risk mitigation determinations and prioritized critical requirements of stake holders in DoD and other agencies, as represented through the Department's Space Industrial Base Working Group.

Program Change Summary (\$ in Millions)

FY 2019 resources (\$M):
FY 2019 Request* \$38.578
*Includes an increase to the Advanced Weapon Component/Materials Production project due to changes in project timelines and obligation/expenditure rates resulting in change of \$1.177M.

FY 2018 resources (\$M):
FY 2018 Request \$37.401
The projects to be executed within FY 2018 resources are identified below. The multi-year cost phasing of each of these projects is addressed in the P5 exhibit.

National Security Space Industrial and Supply Base (NSS ISB) \$21.495
Secure Composite Shipping Containers \$3.001
Advanced Weapon Component/ Material Production \$2.901
Next Generation Jammer Gallium Nitride (GaN) Monolithic Microwave Integrated Circuits (MMIC) & Wideband Circulator Technologies \$3.001
Next Generation Soldier Protection \$7.003

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| Exhibit P-40, Budget Line Item Justification: PB 2019 Office of the Secretary Of Defense | | Date: February 2018 |
| 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 |
| 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>FY 2017 resources (\$M): FY 2017 Request \$44.091 Congressional increase +\$20.000 Total FY 2017 Appropriated \$64.091 Transfer from Department of Energy (DOE) +\$45.00 Total DPA Fund \$109.091</p> <p>FY 2017 Congressional increase of \$20M was applied to the Alane Fuel project. This project develops aluminum trihydride or "AlH3" industrial base in support of DoD applications by building two pilot production sources within the US. FY 2017 The \$45M transfer from DOE was used for the Advanced Drop-in Bio-Fuel projects. This initiative establishes a domestic production plant producing Advanced Drop-in Biofuels which includes alternative jet fuel and marine diesel applications allowing the Navy and government agencies to meet their energy goals and objectives</p> <p>This budget includes essential transformational initiatives using the authorities of Title III of the DPA. Project descriptions are provided below for each of the P5 exhibit projects listed, and the single or multi-year cost phasing of each of the projects is addressed in the P5 exhibit.</p> <p>FY 2019 Project Descriptions:</p> <p>NSS ISB - Electron Beam Direct Write (FY 2016 – FY 2019): This project addresses a need for an advanced lithography tool for government integrated circuit developments. It will have benefits in vastly reduced mask costs, improved design turn-around times, improved yield & reliability, improved design security (trust), and increased die sizes. Production versions of this tool would be inserted in U.S. integrated circuit foundries fabricating parts for space and defense applications at a relatively low cost (versus commercial advanced lithography solutions in development) per system. The proposed project will accomplish the first such insertion. The project is to complete the development of a piece of lithography equipment that uses multiple electron beams (e-beams) to enable the direct transfer ("writing") of integrated circuit layer descriptions to a physical wafer being processed. Accomplishing this project brings a host of benefits when coupled with 1 D (1-dimensional or "unidirectional") layout techniques as part of a complementary ebeam write (CEBW) methodology.</p> <p>NSS ISB - Photovoltaic Substrates Supply Chain Diversification (FY 2016 – FY 2021): The purpose of this effort is to improve national security by addressing a critical gap in the North American supply chain for defense-critical, high-purity germanium (Ge) metal used for space-qualified photovoltaics in a wide range of warfighting and surveillance assets. Those assets include ground-based infrared (IR) optics for night vision operations, airborne IR windows and optical systems, space-based IR optics, and high-efficiency, multi-junction (M-J) photovoltaics (solar cells) used on over 95% of all space satellite assets, both Government and commercial. The investment will ensure the long-term domestic supply of space-qualified Ge substrates by successfully diversifying into higher-margin products that will maintain profitability and allow the company to serve Ge wafer markets.</p> <p>NSS ISB - Next Generation Reaction Wheel Assemblies (RWA) (FY 2016 – FY 2021): This project addresses a need for a multiple-phase Next-Generation scalable Reaction Wheel (NGRW) project 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, investigate 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.</p> <p>NSS ISB - Radiation-Hardened Digital/Analog Production & Qualification (FY 2016 –FY 2021): 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 Trusted, 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 less than or equal to 45nm technology node to support onboard processing and other critical applications. The objective of this project is to enhance the Radiation Hardened By Design 45nm ASIC/ASSP design flow, optimize selected circuit designs to reduce power and increase performance and complete the design, fabrication, test 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.</p> | | |

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| Exhibit P-40, Budget Line Item Justification: PB 2019 Office of the Secretary Of Defense | | Date: February 2018 |
| 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 |
| 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>NSS ISB - Trusted Field Programmable Gate Arrays (FPGAs) (FY 2016 – FY 2021): 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 do not meet the DoD requirements for Trusted systems as they 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 ensure the availability of advanced "Trusted" and space qualified reprogrammable FPGA technology to support DoD/IC applications including satellite and strategic missile systems. Concerning this effort "Trust" 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.</p> <p>NSS-ISB - Radiation Test Facilities (FY 2017 – FY 2021): Radiation test facilities remain a critical asset to NSS and all of DoD to be able to quantify and qualify the radiation hardness of electronic components. This funding will upgrade and sustain these facilities to fulfill this need. As program budgets shrink in upcoming years, programs are less willing to sustain these facilities, leaving the burden on SMC and the NRO to fund them out of their ever shrinking O&M budget. Without assistance, one of the critical facilities will close (costing over \$1B to reconstitute). Without the current test infrastructure, the DoD would be very under capacity for this capability.</p> <p>NSS ISB - High Strength/High Modulus (HS/HM) Carbon Fibers (FY 2017 – FY 2020): This investment program will ensure there is a domestic industry of qualified to produced High Strength and High Modulus (HS/HM) carbon fibers for NSS and Defense applications. The program's purpose is to reduce inherent supply chain risks associated with a sole source foreign producer in Japan of unique and proprietary level materials while making available to DoD existing domestic second sources of similar materials that are reportedly higher quality, better performing and less expensive. This DoD investment program also supports greater U.S.-Japan (government and industry) defense supply chain security cooperation. If this investment is not made, programs will continue to utilize the sole foreign source, making it unlikely that new programs will consider sourcing from domestic suppliers. This puts NSS and Defense supply at continued risk of disruption due to foreign government controls as well as potential factory closures due to natural and manmade peacetime disasters as well as potential regional conflicts. Any one of these supply disruption scenarios could result in severe and long-lasting supply disruptions affecting multiple programs and their related costs, schedules and performance requirements-in addition to delaying important capabilities to our warfighters.</p> <p>NSS ISB - Mercury Cadmium Telluride Infrared Sensors (Prior Years - FY2021): The goal of this program 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 strategic focal plane arrays (FPAs) to National Security Space (NSS) agencies when needed. The primary goal is to demonstrate on-shore MCT detectors are equivalent in performance to FPAs utilizing off-shore substrates.</p> <p>Projects Other (non-NSS):</p> <p>Secure Composite Shipping Containers Production Capacity (prior years and FY 2017 –FY 2019): 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 security system is designed to confirm the integrity of the container and report breaches to the cognizant authorities. 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 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. Previously budgeted FY2016 funding was executed with prior year funds.</p> <p>Next Generation Jammer Gallium Nitride (GaN) MMIC & Wideband Circulator Technologies (Prior Years and FY 2017- FY 2019): This project is an investment in production technology and capacity expansion for gallium nitride (GaN) monolithic microwave integrated circuits (MMICs) and wideband circulator technologies for Next Generation Jammer (NGJ) program requirements. The objective is to establish/expand one or more domestic sources for GaN integrated circuit components to ensure the availability of critical components required for the Next Generation Jammer and other electronic warfare systems. Additionally,</p> | | |

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| Exhibit P-40, Budget Line Item Justification: PB 2019 Office of the Secretary Of Defense | | Date: February 2018 |
| 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 |
| 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>this initiative will mitigate program risk by ensuring on-shore availability of critical components, maintain secure sources for these essential electronic components through oversight of sources and processes, and address process and quality improvements to drive down costs.</p> <p>Advanced Weapon Component/Materials Production (FY 2016, FY 2018 – Continuing): The purpose of this continuous effort is to use DPA Title III authorities to make investments in the domestic industrial base that maintain the timely availability of critical-need, technologically superior production capabilities that are independently available within the U.S. for both current and future weapon systems, as informed by the Department's key investment strategy documents including the Quadrennial Defense Review (QDR) and the Long Range Research and Development Plan (LRRDP). These resources will focus on projects that span multiple agencies, weapons platforms, and Service needs, enabling the production of capacity for technologies and materials emerging from the technology base that the private sector is unable to respond to within DoD timelines. Technology focus areas include space, undersea, air dominance, strike, missile defense, and emerging technologies.</p> <p>FY 2018 Project Descriptions:</p> <p>NSS ISB - Trusted Field Programmable Gate Arrays (FPGAs) (FY 2016 – FY 2021)</p> <p>NSS ISB - Next Generation Reaction Wheel Assemblies (RWA) (FY 2016 – FY 2021)</p> <p>NSS ISB - Photovoltaic Substrates Supply Chain Diversification (FY 2016 – FY 2021)</p> <p>NSS ISB - Radiation-Hardened Digital/Analog Production & Qualification (FY 2016 –FY 2021)</p> <p>NSS ISB - Electron Beam Direct Write (FY 2016 – FY 2019)</p> <p>NSS ISB - Radiation Test Facilities (FY 2017 – FY 2021)</p> <p>NSS ISB - HS/HM Carbon Fibers (FY 2017 – FY 2020)</p> <p>NSS ISB - Mercury Cadmium Telluride Infrared Sensors (Prior Years - FY2021)</p> <p>Projects Other (non-NSS):</p> <p>Next Generation Jammer Gallium Nitride (GaN) MMIC & Wideband Circulator Technologies (Prior Years and FY 2017- FY 2019)</p> <p>Secure Composite Shipping Containers (prior years and FY 2017 –FY 2019)</p> <p>Next Generation Solider Protection (FY 2016 - FY 2018): 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.</p> <p>Advanced Weapon Component/Materials Production (FY 2016, FY 2018 – Continuing)</p> <p>FY 2017 Project Descriptions</p> | | |

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| Exhibit P-40, Budget Line Item Justification: PB 2019 Office of the Secretary Of Defense | | Date: February 2018 |
| 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 |
| 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>NSS ISB - Radiation-Hardened Transistors & Diodes (FY 2016 – FY 2017): Many present and future DoD and intelligence systems have identified Rad Hard components as a critical base technology. There are very few remaining suppliers of Rad Hard space qualified components such as diodes, Metal Oxide on Silicon Field Effect Transistors (MOSFET), insulated-gate bipolar transistor (IGBT), Optocouplers and other Optical devices, Glassless diodes, JANKC diode dies, and more. These components are used almost universally to provide power and conditioned signals to Application-Specific Integrated Circuit (ASIC) and Field Programmable Gate Arrays (FPGA) circuits. Since this is an extremely niche market, a single company is the only manufacturer of components that designs and produces entirely with US persons in a US facility, and specializes in military, aerospace and space. The company also provides products to commercial space, to companies such as Boeing, Lockheed Martin, and Space Systems Loral. The reduction in demand for strategic radiation hardened electronics (RHE) (e.g., >1Mrad total ionization dose) over the past 15 years has resulted in a substantial decrease of the industrial base, which is down to two main suppliers, and only one supplier, which designs and manufactures their components in the USA today and has a proven process for Rad Hard by Design products.</p> <p>Projects Other (non NSS-ISB):</p> <p>Advanced Microelectronics Trusted Foundry (FY 2017): This project supports the Department's efforts to maintain domestic trusted sources of advanced microelectronics production. AT&L's strategy is focused on improving capability to evaluate and validate trust of microelectronics parts and advance standards to incentivize the commercial marketplace to recognize trust as a competitive design standard, and develop alternative approaches to the current manufacturing-driven means of trust to enable broader DoD access to commercial state of the art technology.</p> | | |

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| Exhibit P-5, Cost Analysis: PB 2019 Office of the Secretary Of Defense | | | | | | | | | | | | Date: February 2018 | | | | | | | |
| 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: | | | | | | | | | | |
| Resource Summary | | | | Prior Years ⁽⁺⁾ | | | FY 2017 | | FY 2018 | | FY 2019 Base | | FY 2019 OCO | | FY 2019 Total | | | | |
| Procurement Quantity (Units in Each) | | | | - | | | - | | - | | - | | - | | - | | | | |
| Gross/Weapon System Cost (\$ in Millions) | | | | 1,771.955 | | | 109.091 | | 37.401 | | 38.578 | | - | | 38.578 | | | | |
| Less PY Advance Procurement (\$ in Millions) | | | | - | | | - | | - | | - | | - | | - | | | | |
| Net Procurement (P-1) (\$ in Millions) | | | | 1,771.955 | | | 109.091 | | 37.401 | | 38.578 | | - | | 38.578 | | | | |
| Plus CY Advance Procurement (\$ in Millions) | | | | - | | | - | | - | | - | | - | | - | | | | |
| Total Obligation Authority (\$ in Millions) | | | | 1,771.955 | | | 109.091 | | 37.401 | | 38.578 | | - | | 38.578 | | | | |
| (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) | | | | - | | | - | | - | | - | | - | | - | | | | |
| Budget Years Cost values do not sum to the represented total intentionally: (+) Prior Years Cost Delta: 1,650.401 million | | | | | | | | | | | | | | | | | | | |
| Note: Subtotals or Totals in this Exhibit P-5 may not be exact or sum exactly due to rounding. | | | | | | | | | | | | | | | | | | | |
| Cost Elements | | Prior Years | | | FY 2017 | | | FY 2018 | | | FY 2019 Base | | | FY 2019 OCO | | | FY 2019 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: Electron Beam Direct Write | | - | - | 11.348 | - | - | 6.135 | - | - | 8.714 | - | - | 7.990 | - | - | - | - | - | 7.990 |
| NSS ISB: Photovoltaic Substrates Supply Chain Diversification | | - | - | 0.865 | - | - | 1.609 | - | - | 0.501 | - | - | 0.493 | - | - | - | - | - | 0.493 |
| NSS ISB: Next Generation Reaction Wheels Assembly | | - | - | 0.540 | - | - | 0.503 | - | - | 0.523 | - | - | 1.454 | - | - | - | - | - | 1.454 |
| NSS ISB: Radiation-Hardened Digital/ Analog Production & Qualification | | - | - | 2.918 | - | - | 4.325 | - | - | 1.502 | - | - | 0.987 | - | - | - | - | - | 0.987 |
| NSS ISB: Cadmium Zinc Telluride Substrates | | - | - | 10.592 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| NSS ISB: Next Generation Star Trackers | | - | - | 23.066 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| NSS ISB: Trusted Field Programmable Gate Arrays | | - | - | 1.621 | - | - | 1.307 | - | - | 2.604 | - | - | 2.861 | - | - | - | - | - | 2.861 |

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| Exhibit P-5, Cost Analysis: PB 2019 Office of the Secretary Of Defense | | | | | | | | | | | | | Date: February 2018 | | | | | |
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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 2017 | | | FY 2018 | | | FY 2019 Base | | | FY 2019 OCO | | | FY 2019 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: Radiation-Hardened Transistors & Diodes | - | - | 2.161 | - | - | 1.006 | - | - | - | - | - | - | - | - | - | - | - | - |
| NSS ISB: Radiation Test Facilities | - | - | - | - | - | 0.300 | - | - | 0.314 | - | - | 0.302 | - | - | - | - | - | 0.302 |
| NSS ISB: HS/HM Carbon Fibers | - | - | - | - | - | 2.011 | - | - | 1.828 | - | - | 1.874 | - | - | - | - | - | 1.874 |
| NSS ISB: Mercury Cadmium Telluride | - | - | 1.998 | - | - | 3.804 | - | - | 5.509 | - | - | 5.039 | - | - | - | - | - | 5.039 |
| Subtotal: Non Recurring Cost | - | - | 55.109 | - | - | 21.000 | - | - | 21.495 | - | - | 21.000 | - | - | - | - | - | 21.000 |
| Subtotal: Hardware - National Security Space (NSS) Industrial & Supply Base (ISB) Risk Mitigation Program Cost | - | - | 55.109 | - | - | 21.000 | - | - | 21.495 | - | - | 21.000 | - | - | - | - | - | 21.000 |
| Hardware - Other Cost | | | | | | | | | | | | | | | | | | |
| Non Recurring Cost | | | | | | | | | | | | | | | | | | |
| Secure Composite Shipping Containers | - | - | 7.267 | - | - | 1.989 | - | - | 3.001 | - | - | 6.824 | - | - | - | - | - | 6.824 |
| Advanced Weapon Component/Materials Production | - | - | 6.168 | - | - | 0.026 | - | - | 2.901 | - | - | 7.209 | - | - | - | - | - | 7.209 |
| Advanced Microelectronics Trusted Foundry | - | - | - | - | - | 7.158 | - | - | - | - | - | - | - | - | - | - | - | - |
| Next Generation Jammer Gallium Nitride (GaN) MMIC & Wideband Circulator Technologies | - | - | 16.000 | - | - | 1.988 | - | - | 3.001 | - | - | 3.545 | - | - | - | - | - | 3.545 |
| Harsh Environment Transceivers | - | - | 5.140 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Next Generation Soldier Protection | - | - | 16.449 | - | - | 11.930 | - | - | 7.003 | - | - | - | - | - | - | - | - | - |
| Sustainable Adenovirus Vaccine Production Capability | - | - | 15.421 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Alane Fuel "AIH3" | - | - | - | - | - | 20.000 | - | - | - | - | - | - | - | - | - | - | - | - |
| Advanced Bio-Fuels Redrock | - | - | - | - | - | 45.000 | - | - | - | - | - | - | - | - | - | - | - | - |
| Subtotal: Non Recurring Cost | - | - | 66.445 | - | - | 88.091 | - | - | 15.906 | - | - | 17.578 | - | - | - | - | - | 17.578 |

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| Exhibit P-5, Cost Analysis: PB 2019 Office of the Secretary Of Defense | | | | | | | | | | | | | Date: February 2018 | | | | | |
| 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 2017 | | | FY 2018 | | | FY 2019 Base | | | FY 2019 OCO | | | FY 2019 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) |
| | Subtotal: Hardware - Other Cost | - | - | 66.445 | - | - | 88.091 | - | - | 15.906 | - | - | 17.578 | - | - | - | - | - |
| Gross/Weapon System Cost | - | - | 1,771.955 | - | - | 109.091 | - | - | 37.401 | - | - | 38.578 | - | - | - | - | - | 38.578 |

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