G. Title III of the Defense Production Act

The Defense Production Act (DPA) (50 U.S.C. App. 2061 *et seq.*) is the primary legislation designed to ensure that the industrial resources and critical technology items essential for national defense are available when needed. Title III of the DPA provides a vehicle to establish, modernize, or expand domestic production capability and capacity for technology items, components, and industrial resources that are essential for national defense provided: (1) no domestic capacity exists or (2) the domestic capacity that does exist is insufficient to meet defense needs. Under the authorities of Title III, DoD can provide domestic firms with a variety of financial incentives to reduce the risks associated with establishing the needed capacity. These incentives include purchases or purchase commitments, development of substitutes, and the purchase or lease of advanced manufacturing equipment which can be installed in government or privately owned facilities. DoD uses purchases and purchase commitments most frequently. A key objective of the Title III Program is to accelerate the transition of new leading edge technologies from research and development to affordable production and to insert those technologies into defense systems.

The Department organizes and executes the Title III program as a DoD-wide program, generally focusing on materials and components that can be used in a broad spectrum of defense systems. The Office of the Secretary of Defense provides top-level management, direction, and oversight. The Air Force, acting as the Executive Agent for this program, structures and executes approved and funded projects for the Department. In 2000, the Department initiated three Title III projects, began development of two others, and completed one project.

Silicon-on-Insulator (SOI) Wafers

SOI substrates can significantly reduce costs and improve the performance of low power and/or radiation-tolerant integrated circuits used in military satellite communications systems, ballistic missile upgrades, surveillance systems, and inertial navigation systems. This project will establish domestic sources for SOI wafers (up to eight inches in diameter) that have emerged from research and development but which require lower-cost, higher-volume production capabilities before they can be inserted affordably into DoD systems. The project is designed to provide sufficient incentives to create a domestic SOI wafer production capacity of 1.4 million square inches per year. This project was initiated in March 2000 and will be completed in approximately 48 months. The total value of this effort, including industry cost sharing, is $14.3 million.

Laser Protective Eyewear

This project will establish a highly responsive, affordable production capacity for thin film dielectric coatings on polycarbonate substrates. These substrates are the basic component in laser protective eyewear such as helmet visors, goggles, and spectacles. The widespread proliferation of lasers in military operations is posing an increasingly significant threat of eye injury to military personnel. The project will assure that domestic producers are available to supply these devices in sufficient quantities and at affordable prices to meet defense needs. This Title III project is using purchase and purchase commitment incentives to assist in establishing a viable, domestic production capacity on a high-volume, commercial ("dual-produce") line for laser protective eyewear for military and commercial applications. This project will also accelerate the implementation of compatible interference filter technologies, such as dry process holographic filters and/or rugate filters, to protect against a broader range of laser threats. This project is strongly supported by all the Services since it enables the timely production and fielding of affordable protective eyewear that meets their requirements for protection and operational effectiveness. The total value of this project, including industry cost sharing, is $6.2 million. The project was initiated in August 2000 and is expected to be completed in approximately 36 months.

Microwave Power Tubes

Microwave power tubes generate and amplify microwave energy in radar systems, electronic warfare systems, and telecommunications systems and are required for applications requiring high frequency and high power. Microwave power tubes are a critical element underpinning current and future operational capabilities of most major defense systems and will be needed for the foreseeable future since there are no replacement technologies on the horizon. There are approximately 1,000 different types of microwave tubes used in 270 military systems (over 180,000 total tubes). This project will facilitate the Department's assured access to affordable microwave power tubes by providing incentives to encourage lower tier microwave power tube suppliers to make consistent, quality-driven improvements. DoD's goal is to transition advanced manufacturing processes to the lowest-tier suppliers, thus improving overall quality and lead times and driving down the production and life cycle costs of microwave power tubes to the DoD. The Department will use Title III authorities to facilitate supplier process improvements, qualify alternate materials and processes, and share integration and investments both horizontally across the supplier base and vertically between suppliers and tube manufacturers. Congress appropriated $3.0 million in the Fiscal Year 2000 Defense Appropriation Act (P.L. 106-79) and an additional $2.0 million in the Fiscal Year 2001 Defense Appropriation Act (P.L. 106-259) specifically for this Title III project.

Radiation Hardened, Thin Film SOI Wafers for Digital Devices

DoD is developing this project to establish domestic production capacity for radiation hardened, thin film SOI wafers for a variety of digital circuit applications.

Radiation hardened, thin film SOI wafers are used for fabricating radiation resistant ultra large scale digital devices such as microprocessors, application specific integrated circuits and static random access memory circuits. SOI technology materials are essential to defense telecommunications systems, ballistic missile systems, surveillance systems, radar, passive sensors, and inertial navigation systems. They provide a superior technology for sensitive battery powered applications due to reduced power requirements, increased device density, and faster device performance. This project will emphasize improving SOI wafer radiation hardness, quality, and yield; reducing wafer production costs; and promoting thin film wafer evaluation and qualification. Title III funding programmed for this project is approximately $3.8 million.

Radiation Hardened Microprocessors for Missile and Space Applications

DoD is developing this project to establish a manufacturing capability for radiation tolerant and radiation hardened ("Rad Hard") microprocessors for military and commercial space applications. The effort will develop the manufacturing processes required to produce advanced commercial microprocessors that meet military requirements for radiation hardening. The project will create an accelerated (and repeatable) fabrication process, leveraging commercial capabilities for affordable production. DoD hopes to narrow the performance gap between state-of-the-art commercial microprocessors and Rad Hard microprocessors for military aerospace applications and to increase the capabilities of the domestic industrial base to supply advanced microprocessors for military missile and space applications. Title III funding programmed for this project is approximately $7.5 million.

Semi-Insulating (SI) Indium Phosphide (InP) Substrates

InP substrates are vital to electronic defense applications requiring ultra high-speed operating frequencies (seekers and battlefield radar), lower power consumption (satellite crosslinks and battlefield communication systems), and exceptional low noise performance (Extra High Frequency low noise receivers and analog/digital converters). This project, which was completed in 2000, established a viable, long-term domestic manufacturing capability for InP wafers by accelerating the insertion of InP technology, expanding domestic production capacity, improving quality, increasing wafer diameter, and lowering production costs. Indium Phosphide substrates will have a far reaching, positive impact on DoD for several years to come. Savings for weapons systems alone have been calculated at $35 million through the year 2004. The project also will have a major commercial market impact by increasing access to large diameter, high quality, affordable substrates supporting next-generation wireless consumer products and greatly enhanced internet communication speeds. As a result of this project, wafer prices declined approximately 30 percent and the U.S. companies increased their global market share from less than one percent in 1996 to more than a combined 17 percent (forecasted) in 2000. Total funding for this project was $10.1 million including cost sharing by the contractors.