

## **H.R. 6395, the FY 2021 National Defense Authorization Act Priority Excerpts of Priority Items of Interest**

### **Army intelligence, surveillance, and reconnaissance programs**

The committee recognizes that airborne intelligence, surveillance, and reconnaissance (AISR) capability has become an integral aspect of modern military operations. Each military service has fielded its own AISR, often optimized for service-specific mission requirements. The committee is aware that the Army ISR Task Force is examining AISR requirements and available options for fulfilling these requirements in a cost-efficient manner. Long range precision fires, the Army's highest modernization priority, depends upon deep sensing provided by ISR assets.

Available information from the Army indicates that long-term modernization plans for the Airborne Reconnaissance Low Enhanced (ARE-L), the Guardrail Common Sensor, and the Enhanced Medium Altitude Reconnaissance and Surveillance System are unclear beyond the Future Years Defense Program. The committee further notes that while the Army's budget briefings depict data link and avionics upgrades to the MQ-1 Gray Eagle unmanned aircraft system, the Army has yet to outline plans for a service life extension program or a follow-on medium-altitude ISR aircraft.

The committee is concerned about the tendency of each military service to construct acquisition plans without accounting for the role of the joint force and capability overlap between military services. Elsewhere in this Act, the committee requires the Department of the Air Force to submit a comprehensive plan on AISR modernization and replacement. The committee is aware of Army ISR Task Force discussions with other military services and encourages the Task Force to continue this collaboration across the military services to ensure the Army invests in the critical and service-specific capabilities it will need to support the joint force.

Therefore, the committee directs the Secretary of the Army, in consultation with the Chief of Staff of the Army, to provide a briefing to the House Committee on Armed Services by November 1, 2020, on plans for modernization of the Army's airborne intelligence, surveillance, and reconnaissance capability. This briefing should cover the entire Army AISR enterprise, demonstrate how the Army intends to meet ISR requirements through fiscal year 2034, and detail which requirements the Army expects other services to provide.

### **Future Vertical Lift sensor payloads**

The committee expects the Army's Future Vertical Lift (FVL) program to field advanced sensor payloads capable of detecting, tracking, and countering threats in the future operational environment. The committee notes that the Army has yet to define the acquisition strategy for FVL mission equipment payloads and sensors, despite an accelerated platform development schedule. The committee understands that fielding mission equipment that is as advanced and capable as the platforms themselves will require investment and development in the coming years. The committee is concerned that without a well-defined acquisition strategy and risk reduction effort for mission equipment payloads and sensors, industry will be unable to make the investments necessary to deliver advanced capabilities on time for FVL programs.

Therefore, the committee directs the Secretary of the Army to submit a report to the Committees on Armed Services of the Senate and the House of Representatives by December

1, 2020, on Future Vertical Lift mission equipment payloads and sensors. The report should include:

- (1) the acquisition strategy for FVL mission equipment payloads and sensors, including radar, electronic warfare, 360 degree distributed aperture, missile warning, and advanced electro-optical infra-red;
- (2) planned risk reduction activities for the sensor payloads; and
- (3) an estimate of the cost and schedule for the development and production of required sensor payloads.

### **Aviation Survivability of Marine Corps, Navy, and Air Force Rotary Wing Aircraft**

The committee recognizes the importance of the Distributed Aperture Infrared Countermeasure System (DAIRCM) and the Department of Defense's efforts to integrate an aircraft protection system to protect small to medium rotary wing aircraft from increased threats. These protection systems have been combat deployed by the Air Force. The committee is aware of enhanced capabilities that can provide light and medium rotary aircraft a dual-warning and defeat capability, able to counter surface-to-air missiles, small arms fire, and other anti-aircraft or laser-directed weapons threats confronting our forward-deployed forces. The committee recognizes there is a future gap in this aircraft survivability capability for both the Air Force and Marine Corps in the coming fiscal years and supports the efforts by these services to rapidly transition to a production capability. This transition will ensure all Marine Expeditionary Units and forward deployed Air Force rotary wing aircraft are properly equipped to meet this threat. Therefore, the committee directs the Secretary of the Navy in coordination with the Commandant of the Marine Corps and Chief of Staff of the Air Force, to provide a briefing to the House Committee on Armed Services by March 1, 2021, on the effective integration of DAIRCM into additional light and medium rotary wing aircraft and the long-term strategy for aircraft survivability of the Marine Corps and Air Force rotary wing fleet.

### **Air Force Advanced Technology Development Report**

The committee recognizes that our service members and military leaders face evolving challenges that will require integration of the Air Force's science and technology development efforts in order to reassert the United States' competitive advantage across every warfighting domain. The committee is aware of the consolidation of thirteen Advanced Technology Development (ATD) Program Elements (PE) into five new PE lines within the Air Force's Research Development Test and Evaluation (RDT&E) funding in section 4201. The committee is concerned about losing insight and transparency during the Air Force's transition and implementation phase. Therefore, the committee directs the Secretary of the Air Force to submit an initial report to the congressional defense committees no later than October 30, 2021, on the amount of funding allocated to each Air Force Research Laboratory (AFRL) Directorate from the ATD RDT&E Budget Activity 03 (BA03) lines in Fiscal Year (FY) 2021. For transparency and consistency, the committee directs the Secretary of the Air Force to submit a final report to the congressional defense committees no later than October 30, 2022, on the amount of funding allocated to each AFRL Directorate from the ATD RDT&E BA03 lines in FY 2022.

### **Report on Counter-Radar Electronic Warfare and Signal Processing Capabilities**

The committee understands that advances in foreign anti-access and electronic warfare technologies require commensurate advances in technologies designed to ensure the comparative advantage and dominance in US electromagnetic spectrum operations capability.

The committee understands there is a potential requirement and need to identify advanced mobile threats within milliseconds, to negate their operational effectiveness and nearly simultaneously provide technical electronic battle damage assessment.

The committee is aware the Department of Defense has demonstrated a high fidelity open-air scene target generator capability. The committee understands this capability would provide a suite of active operations options for dominance in contested radio frequency spectrum environments. The committee notes this capability has completed initial free-space testing at a government range and understands that this is a unique capability in that it can operate within the adversary system sensor processing cycle and is not readily detectable as an electronic warfare technique.

Therefore, the committee directs the Assistant Secretary of the Air Force for Acquisition, Technology and Logistics, in coordination with the Secretary of the Air Force, to submit to the congressional defense and intelligence committees a report by March 1, 2021 detailing the efforts required to integrate high fidelity open-air scene target generator capability into appropriate platforms and electronic warfare command and control systems and how integration is resourced over the future years defense program. The report shall be submitted in unclassified form, with an accompanying classified annex, if necessary.

### **Assessment of High-Powered Microwave Systems**

The committee recognizes that directed energy technologies such as high-powered microwave (HPM) systems are being developed by the Department in order to provide non-lethal alternatives in combat and to maintain pace with our adversaries. The committee notes that as these technologies transition from the laboratory to an operational environment, it is critical that the Department assess and prepare for the maturation of these capabilities. Therefore, the committee directs the Under Secretary of Defense for Research and Engineering, in consultation with the heads of the military departments, to provide a briefing to the House Committee on Armed Services no later than January 15, 2021 on the development plan for HPM systems including the maturity of current research and development efforts, conformance to electromagnetic environmental effects requirements such as military standard 464 (MIL-STD-464), the status of the test capabilities required for verification and validation for all expected operational environments, the concept of operation of such systems, and potential vulnerabilities of Department systems to a HPM attack.

### **Modular Open Systems common data standards**

The committee continues to be encouraged by the development, demonstration, and validation of common data standards and implementation of the Modular Open Systems Approach. However, the committee is concerned that access to these standards by the general academic population and technology industry remains limited. The committee notes that while a subset of the components of these standards are based on sensitive or classified information, that the data standards and interfaces used by the Department are predominantly based on publicly available sources such as foundational science and engineering principles. The committee further notes that restricting public access to the portion of the standards based on public knowledge unnecessarily increases cost for the conversion of commercial products to defense applications and limits the experimentation and innovation available to the Department of Defense. The committee is concerned that barriers to accessing these standards have an outsized impact in the fields of artificial intelligence, autonomy, and unmanned air vehicles. Accordingly, the committee directs the Secretary of Defense to provide a report to the House Committee on Armed Services not later than February 15, 2021, on:

- (1) which components of the common data standards used by the Department are based on publicly available knowledge, to include, at a minimum: Open Mission Systems developed by the Air Force; the Future Airborne Capabilities Environment developed by the Navy; and the VICTORY Initiative, developed by the Army;
- (2) the applicability of these components to artificial intelligence-based technologies, including autonomous ground vehicles or unmanned air vehicles;
- (3) the feasibility of releasing a public subset of the data standards to reduce the barriers to research with, and adoption by, academia and technology companies;
- (4) an assessment of the cost savings to the Department attributable to the public release of a subset of the data standards; and (5) an assessment of the benefit in developing the national security workforce by releasing a public subset of the data standards.

### **Next generation semiconductor development and manufacturing**

The committee believes that the Department of Defense declaration of 5th generation (5G) communications information technology as a modernization priority, as well as the global proliferation of 5G communications technology, provides an opportunity to fully assess the security of all 5G components, to include semiconductors. The committee is aware that the commercial demand for 5G technology is stimulating foreign investment, particularly by China, to develop advanced Gallium Nitride (GaN) and Gallium Arsenide (GaAs) radio frequency integrated circuit (RFIC) technology at a pace faster than the U.S. industrial base can sustain. RFIC technology is a key enabler to high performance military radar, secure communication, electronic warfare platforms and 5G infrastructure, providing a strategic technology advantage for the Department of Defense to maintain national security and warfighter viability. Commercial volumes for next generation RFICs to support a 5G roll-out will far outstrip Department of Defense demand, providing foreign competitors with motivation to fund research and development and effectively establish themselves as global leaders in a mission-critical industry. The committee is concerned that if the commercial economies of scale for these critical technologies are lost to foreign competitors, the United States's ability to maintain technology superiority will be directly compromised. The committee supports the Department of Defense's efforts to prioritize the development and procurement of both GaN and GaAs technology that can deliver next generation RFIC technology supporting both strategic Department of Defense priorities and 5G commercial demands.

### **Section 225—Directed Energy Working Group**

This section would establish a Directed Energy Working Group inside the Department of Defense to coordinate directed energy efforts across the military services, leverage shared research and development, eliminate redundant efforts, and expedite the operationalization of directed energy programs.

### **Sensor Open Systems Architecture and C4ISR Modular Open Suite of Standards Military Standards Initiative**

The committee is encouraged by the military services supporting Modular Open Systems Architectures (MOSA) on all future programs and platform modernization efforts. For example, the Army's C4ISR Modular Open Suite of Standards (CMOSS), and the Air Force's Sensor Open Systems Architecture (SOSA) standards are significant advances.

The committee appreciates the efforts to increase capabilities, speed development, speed technology refresh, lower costs for the Government, and increase competition in the industry. The committee is aware of marked progress made by the Army's PEO (Program Executive Office) C3T (Command, Control, and Communications-Tactical), PEO IEW&S (Intelligence,

Electronic Warfare and Sensors), and Network-CFT (Cross-Functional Team). The committee commends such forward thinking and movement to unify around these standards. Furthermore, the committee recommends that CMOSS and SOSA military electronics standards be more tightly connected to use the same hardware pinout standards and, more importantly, the same software data transport protocols, such as the Modular Open RF Architecture (MORA), to further solidify a common Department of Defense-wide technical approach to create an open systems architecture standard by which small businesses and large primes can compete. To achieve a more effective economy of scale, the CMOSS and SOSA standards must both be a unified hardware and software ecosystem. The committee believes CMOSS is more established at this time and should lead.

Finally, the committee believes the military services should begin to combine missions to enable CMOSS and SOSA for multi-mission tactical communications, EW (electronic warfare), SIGINT (signals intelligence), and battlefield computing in one system. Such an effort will reduce the SWaP (size, weight, and power) on various platforms for the military electronics, and unify the industry around common military hardware, as well as software, standards. The committee looks forward to further efforts by the Department of Defense to standardize procurement of modular cards and software according to the CMOSS and/or SOSA standards, for all future modernization and new weapons systems. These efforts will increase competition rather than have the classical single vendors drive their proprietary solutions which will cost the Government much higher modernization costs and decrease innovation.