

**NATIONAL DEFENSE AUTHORIZATION
ACT FOR FISCAL YEAR 2018**

R E P O R T

[TO ACCOMPANY S. 1519]

ON

TO AUTHORIZE APPROPRIATIONS FOR FISCAL YEAR 2018 FOR
MILITARY ACTIVITIES OF THE DEPARTMENT OF DEFENSE, FOR
MILITARY CONSTRUCTION, AND FOR DEFENSE ACTIVITIES OF
THE DEPARTMENT OF ENERGY, TO PRESCRIBE MILITARY PER-
SONNEL STRENGTHS FOR SUCH FISCAL YEAR, AND FOR OTHER
PURPOSES

TOGETHER WITH

ADDITIONAL VIEWS

**COMMITTEE ON ARMED SERVICES
UNITED STATES SENATE**



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to enhance these efforts and understands that SOCOM has successfully developed and acquired a number of new capabilities, including improved weapon effectiveness, target location and tracking, image resolution, and video transmission during that time. The committee expects SOCOM to update the committee periodically on its development efforts under the MALET MQ-9 UAV program.

Items of Special Interest

Active electronically scanned array radar improvements

The committee notes that Air Force and Navy fighter aircraft are equipped with active electronically scanned array (AESA) types of radars, and all services are actively pursuing retrofit of these types of radars on legacy aircraft. The Air Force has identified threats from adversaries operating at frequencies where AESA radar's capability can be further improved, and has tasked the Air Force Research Laboratory to lead the development of technologies that address these capability gaps, in order to develop hardware that can be used across the services to address spectrum threats to radars, weapons, missile seekers, and other airborne platforms. The Committee encourages the Air Force to continue these efforts and provide resources as needed to develop newer, more capable arrays which will provide significant performance advantages.

Advanced airlift airship technology

The committee has continuing interest in advanced lighter-than-air (LTA) logistic airship technology and remains eager to see practicability, operating utility, and cost benefits proven, believing that advanced technology in this area can provide a transformational logistic capability for the Department of Defense by adding particular value to a range of airlift missions. Advanced airships have the potential to effect significant changes in atmospheric flight; however, fostering government involvement and leadership remains the vital catalyst to help advanced airships emerge.

To this end, the Senate report accompanying S. 2943 (S. Rept. 114-255) of the National Defense Authorization Act for Fiscal Year 2017 directed the Secretary of Defense to stand up leadership responsibility for an advanced airship initiative. The goal was to encourage the successful development of outsize airlift technology that could release revolutionary capability for defense logistics, particularly with respect to long range "point of need delivery" and outsize or extreme weight airlift to facilitate humanitarian assistance, disaster relief, and non-combatant evacuation operations.

Airship efforts during the past 20 years or more have failed to make a breakthrough as viable cargo carriers. The committee has determined that a more deliberate approach to the development of future airship technology is evidently required. The transformational potential for outsize cargo airlift is not in doubt: the committee notes that the United States Transportation Command has stated previously that airships possess the key to a substantial strengthening of military air mobility. However, effective developmental execution has been missing.

The committee believes that this can be changed and the technology successfully matured through robust engagement by the De-

fense Department. Simple “blimp” technology is not the basis of a successful program. The goal must be an advanced air vehicle that is consistent with 21st century military transportation needs. The demand for structured experimentation and development leading to demonstration appears best suited to be undertaken by the Defense Advanced Research Projects Agency, where there is a history of advanced airship work, notably, the heavy-lift Walrus program.

The introduction of a system of integrated advanced airship lift technologies is the key to addressing the hard issues of in-flight buoyancy control, vertical take-off and landing capability, and ballast generation. In this way, airships operating with extreme outsize payloads can achieve the operating standards that are typical of modern air transportation. The Defense Advanced Research Projects Agency, working with the military, industry, and commercial sector, is uniquely agile and fitted to manage this type of approach.

The Department must take the lead to explore advanced airship outsize cross-modal airlift to meet the emerging needs of the Air Force, United States Transportation Command, and the other combatant commands. In this regard, the committee directs that, not later than 180 days after the date of enactment of this Act, the Secretary of Defense shall:

- (1) Identify a senior leader to reaffirm defense leadership and responsibilities for airship technical initiatives;
- (2) Provide an outline for a future Department of Defense airship technology strategy that takes ownership of maturation efforts consistent with military outsize airlift capability to identify:
 - (a) Critical technology challenges and demonstrations required to provide proof of viability;
 - (b) Development risks and important lessons learned; and
 - (c) Impediments to successful demonstration, including gaps in Department of Defense understanding of airship technology; and
- (3) Lay out notional estimates for time, costs, and other necessary resources to conduct an incremental demonstration for technical viability with suitable decision points and off-ramps.

Aircraft battery cost-savings technology improvements

The committee believes all proven and relevant technologies should be investigated for application to existing platforms if such an application would greatly reduce the cost to the government. In particular, lithium-ion battery technology, a proven commercial technology, would bring better, more efficient power storage capability to military aircraft.

Because all military aircraft rely on effective batteries for systems starting and emergency power, a durable and reliable battery is a key component to an effective fighting asset. Any power-density increases or battery life improvements lead directly to cost savings through reductions in maintenance cycles, purchasing costs, and space and weight requirements. Estimates show that leading lithium-ion batteries can offer 2 to 3 times the service life of tradi-