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## **Senate Appropriators Recommend Additional \$25 Million For Protected Tactical Waveform**

*By Pat Host*

The Senate Appropriations Committee (SAC) last week approved an additional \$25 million in fiscal year 2016 for the Air Force's Advanced Extremely High Frequency (AEHF) Protected Tactical Waveform (PTW) mission.

The committee, in its report accompanying the bill, said it is concerned that the PTW mission management system and ground station hub electronics and software are not being co-developed, which the committee believes could lead to a multi-year delay in the fielding of the system and the potential for non-optimal system design. SAC said the \$25 million is for the mission management system and ground station hub electronics and software development to enable protected communications utilizing existing military and commercial space assets.

Senate Democrats last week voted to block the appropriations bill from reaching the floor for a vote. The House already approved its version of the FY '16 appropriations bill, leaving it to both chambers to reach agreements in conference.

PTW is a government-owned waveform designed with frequency-hopping spread spectrum (FHSS) to provide greater anti-jamming capabilities while featuring a mix of the current protected waveform and the commercial waveform, according to the non-profit Aerospace Corp. PTW also has several design features, including unclassified terminal development for forward users in a high-risk environment and supporting multiple satellite communications (SATCOM) architectures from simple transponder satellites to complicated, fully processed satellites of the future.

The Air Force believes PTW would provide additional capability over current wideband systems, including Wideband Global Satcom (WGS). Air Force Space and Missile Systems Center (AFSMC) Executive Director David Madden said in May that PTW has been tested on WGS as well as on commercial systems. Interoperability between military and commercial platforms would allow simple interoperability, Madden said, while providing additional anti-jam protection. Madden said AFSMC is also looking at PTW as a potential foundation for a future protected tactical communications system (Defense Daily, May 2).

Northrop Grumman [NOC] said in April it successfully demonstrated a space-design PTW processor that enhances user data rates up to a factor of 20, according to a company statement. Northrop Grumman said its processor also improves spectral efficiency up to a factor of four and provides bandwidth-on-demand to significantly improve warfighter communications in contested tactical environments.

Northrop Grumman's testing was completed as part of AFSMC's military satellite communications (MILSATCOM) design for affordability risk reduction effort with the Massachusetts Institute of Technology (MIT) and Lincoln Labs. The processor

successfully communicated using the Air Force-developed PTW, which builds upon the proven protection features of the Advanced Extremely High Frequency (AEHF) program's extended data rate waveform known as XDR.

Satellite operator Intelsat General (IGC) recently participated in tests led by the Air Force that validated PTW modem performance over Intelsat S.A.'s [!] upcoming high-throughput satellite Intelsat Epic satellite platform, according to an IGC blog post. PTW will provide cost effective, protected communications over both government and commercial satellites in multiple frequency bands: C-, Ku-, Ka- and X-band.

Mark Daniels, Intelsat General vice president of engineering and operations, said the company is working to show how it can bring the Air Force's PTW capability into a commercial service that can offer added levels of protection over commercial satellites for warfighters, according to a company executive.

"We believe warfighters can benefit from...another level of protection that's one step below what's available today with AEHF," Daniels told Defense Daily in a recent interview.

Lockheed Martin [LMT] is the prime contractor for AEHF.