STATEMENT BY

DANA DEASY
DEPARTMENT OF DEFENSE CHIEF INFORMATION OFFICER

BEFORE THE
SENATE ARMED SERVICES COMMITTEE

ON

"DEPARTMENT OF DEFENSE SPECTRUM POLICY AND THE IMPACT OF THE FEDERAL COMMUNCIATIONS COMMISSION'S LIGADO DECISION ON NATIONAL SECURITY"

May 6, 2020

NOT FOR PUBLICATION UNTIL
RELEASED BY THE SENATE ARMED SERVICES COMMITTEE

Introduction

Good afternoon Mr. Chairman, Ranking Member, and distinguished Members of the Committee. I am Dana Deasy, the Department of Defense (DoD) Chief Information Officer. Thank you for the opportunity to testify on the national security risks posed to Global Positioning System (GPS) operations resulting from the Federal Communications Commission (FCC) decision to authorize Ligado's license modification to begin terrestrial wireless operations. Before we begin, I would like to thank the Committee's leadership for the concerns you raised to the President over the likely harm to military capabilities, particularly for the U.S. Space Force, resulting from this decision.

Unacceptable Risks to GPS

On April 19, 2020, the FCC unanimously adopted an Order that approved Ligado's license modification to launch a nationwide, cellular network by repurposing a portion of spectrum adjacent to the spectrum segment used by the GPS L1 signal. Throughout this proceeding, the Department made it clear that approving Ligado's plans would cause harmful interference to millions of GPS receivers across the country, both civilian and military. DoD senior leadership engagement on this matter has been long-standing and consistent, as part of a coordinated interagency approach for assessing the impact to reception of the GPS L1 signal. The National Space-Based Positioning, Navigation and Timing (PNT) Executive Committee (EXCOM), representing nine Federal agencies who use GPS, began raising concerns to National Telecommunications and Information Administration (NTIA) about earlier versions of Ligado's proposal and the harmful interference impacts for GPS in 2012. The PNT EXCOM's nine Federal agency members, including DoD and the Department of Transportation (DoT), also

signed a joint letter in December 2018 to NTIA, unanimously and unambiguously objecting to the latest Ligado license modification request.

Starting in 2012 and spanning across several administrations, multiple Secretaries of Defense have raised GPS interference concerns about the plans of Ligado and its predecessor companies. In letters in April and June 2019, the then Acting Secretary of Defense Patrick Shanahan sent letters to request that the FCC not allow the deployment of the proposed Ligado system. The current Secretary of Defense Mark T. Esper also sent a letter to the FCC Chairman on November 18, 2019, requesting that the Commission not allow the terrestrial wireless system proposed by Ligado to move forward.

In line with these concerns, on December 6, 2019, NTIA leadership informed the FCC that they did not support the approval Ligado's license modification request. On March 12, myself and Dr. Michael Griffin, Under Secretary of Defense for Research and Engineering, wrote to NTIA to further reinforce DoD's conclusion that the FCC's approval of Ligado's license modification request would cause unacceptable operational impacts and adversely affect the military potential of GPS. We asked NTIA to forward that letter to the FCC to be included in the record of the Ligado proceeding. As recently as March 24, Deputy Secretary of Defense David Norquist reiterated the Department's strong opposition in a letter to the Department of Commerce.

After reviewing the details of the FCC's decision, DoD concludes the final Order still does not ameliorate these serious concerns or alter our findings that the Commission should have denied Ligado's license modification request. Congress directed, under 10 U.S.C. 2281, that the Secretary of Defense "may not agree to any restriction on the GPS" proposed by the head of a

U.S. Department or agency that would adversely impact the military potential of GPS. Based on the tremendous risk to GPS, DoD does not agree with the FCC's decision.

A key area of disagreement is the FCC's justification that the Order placed "stringent conditions" on Ligado's network deployment plans to ensure that GPS users would not experience harmful interference. However, these conditions will not protect GPS receivers against harmful interference and are thus unrealistic and unacceptable to the Department. DoD already assessed these requirements during the interagency review process, including evaluation by the PNT EXCOM. In addition to the work of the PNT EXCOM, extensive and technically rigorous testing and analysis was conducted over the past nine years by DoD, the National Space-Based PNT Engineering Forum, the DoT Adjacent Band Compatibility (ABC) Assessment and Air Force testing of eighty (80) GPS L1 receivers in 2016. These efforts all reached the same conclusion, which is that the Ligado proposal will disrupt GPS.

Testing supported by the nine Federal agency users of GPS receivers who make up the PNT EXCOM concluded that the risk is far too great, and far too many questions remain, for Ligado's proposal to be approved. The DoT ABC Assessment highlighted the much lower power levels and significant separation distances needed to effectively protect GPS operations under the Ligado proposal. In the aggregate, these test results clearly showed that the conditions in this FCC Order will not prevent impacts to millions of GPS receivers across the United States, with massive complaints expected to come. In fact, the Department believes this FCC ruling increases the risk that American families and businesses may turn to foreign space-based navigation and timing systems like China's BeiDou and Russia's GLONASS, to replace the functions of GPS if

it becomes unreliable due to interference from Ligado operations. This is fundamentally a bad deal for America's national and economic security.

Unfortunately, the "stringent conditions" of the FCC's Ligado Order fall short in many critical respects, including:

- ***Guard Band***: The Order includes the 23 MHz "guard band" to protect GPS L1 receivers from Ligado's terrestrial based network. GPS receivers are designed to receive signals from space and would be overpowered by this terrestrial network regardless of this protection. Despite this guard band, many varieties of GPS receivers would still suffer interference. To be clear, Ligado's proposal is to field a terrestrial-based network. GPS has a satellite-based space segment that transmits radio signals to users. This means that GPS L1 receivers are designed to tolerate interference from space systems in adjacent spectrum, but <u>not</u> to tolerate interference from terrestrial systems in the adjacent band.
- ***Power Levels***: Another FCC condition is to require Ligado to limit the power levels of its base stations significantly compared to its original proposal to the FCC. However, even these substantial reductions fail to meet the power levels that can be tolerated in bands adjacent to GPS L1 signals that were studied by the DoT.
- ***Coordination***: The Order's conditions also include coordination procedures, such as requiring Ligado to continuously monitor the transmit power of base station sites and follow procedures for responding to reports of interference. Coordination and notification requirements normally work well with spectrum sharing and DoD often champions such measures. However, there are millions of GPS receivers in use by Federal agencies, industry and general consumers that are mobile. Given the massive scale, there is no way to protect those mobile operations. This challenge is compounded by the fact that most GPS users

would never know if Ligado disrupted their equipment in the first place or who to call about a problem.

- ***Government GPS Receivers***: The FCC Order expects Ligado to protect U.S. government GPS receivers and to repair or replace affected receivers identified before Ligado terrestrial operations commence. But this overlooks the classified nature of military GPS use and the sheer number of government receivers and military platforms affected. The FCC expectation is unreasonable and could never be employed in real practice. To avert significant mission impacts, the government would need to undertake unprecedented accelerated testing, modification and integration of new GPS receivers on existing platforms. This is cost and schedule prohibitive and would significantly degrade national security.

The inability of Ligado to meet these stringent conditions in order to protect GPS is why the FCC should have rejected the Ligado proposal, based on the extent that no practical solution or mitigation is available that would permit Ligado to operate without high likelihood of widespread interference. The bottom line is that there are too many unknowns and the risks are too great to allow the proposed Ligado system to proceed in light of the operational impact to GPS.

Importance of Protecting GPS

A 2019 report sponsored by the National Institute of Standards and Technology estimated that in the United States, GPS generated about $1.4 trillion in economic benefits since the 1980s, with most benefits accruing in the last decade because of the rapid growth in information technologies, including advanced wireless services. DoD has a responsibility to ensure the protection of GPS, including when regulatory changes are contemplated (i.e., Ligado's request

for license modification). DoD is committed to a "whole of nation" approach to 5G pilot experimentation. In February, President Trump signed an Executive Order on "Strengthening National Resilience through Responsible Use of PNT Services." The Executive Order stated that it is U.S. policy "to ensure that disruption or manipulation of PNT services does not undermine the reliable and efficient functioning of its critical infrastructure." This national policy directive recognizes that ubiquitous availability and reliability of GPS has made it an integral part of the fabric of our society, ranging from the location features in cell phones to navigation for vehicles and aircraft to routine banking transactions. GPS allows us to pinpoint 911 calls, launch precision airstrikes, prepare our forces for combat, and engage in many other actions foundational to protecting the American public at large. Furthermore, the Department utilizes GPS to protect and serve the public by tracking national security and terrorist threats and building readiness to protect the homeland and our interests abroad. It is for this reason that the DoD strongly opposes the Ligado license modification request as not being in the best interest of our nation.

U.S. and DoD 5G Leadership

DoD recognizes the importance of 5G as it relates to the economic and national security of the nation. Ligado portrays their solution to be 5G, but because there is no evidence that they have a technically viable 5G solution, they are misrepresenting their offering. The band in which Ligado operates is not part of the FCC's 5G FAST Plan, which is the Commission's blueprint for advancing U.S. interests in 5G.

The non-contiguous bands that Ligado could bring to market are fragmented and impaired. Furthermore, Ligado's plans only target a small subset of 5G specifications, mainly

limited Internet of Things, rather than the full range of high data rate, ultra-fast 5G services needed to reach the full promise of 5G benefits for businesses and consumers.

DoD recognizes the need to share spectrum where and when it makes sense and wants to improve both technology and policy innovations to advance 5G objectives. One example of why this approach works is our success in advancing the FCC's 3.5 GHz Citizens Broadband Radio Service sharing decision. This sharing framework for 3.55-3.65 GHz, which is a vital air search radar band for Navy operations, is paving the way for the FCC's first mid-band 5G spectrum auction in July 2020. This "whole of nation" approach is DoD's commitment to 5G pilot experimentation. This work brings together government, industry and academia to solve tough problems facing the nation with regard to 5G, spectrum access and sharing.

Summary

DoD has conducted a balanced approach to assessing the risks and benefits of new wireless industry proposals. This is why DoD applied technical rigor and vigorous assessment to its conclusions on the Ligado plans. The Ligado proposal and the risks posed to GPS demonstrates that the FCC decision is misguided. Instead, the Ligado solution causes more harm than good to the nation's spectrum use. The Department supports the President's 5G goals, however, we need to ensure that regulatory decisions that increase wireless industry access for cellular networks do not do so at the expense of GPS user requirements. The FCC's Ligado decision is flawed and must be reversed. As the Committees has so clearly expressed, this is a bad deal for America.

I want to emphasize the importance of our partnerships with Congress in all areas, but with a particular focus on protecting the warfighter and ensuring the integrity of GPS to operate without harmful interference. I look forward to continuing to work with Congress in this critical area. Thank you for the opportunity to testify today and I look forward to your questions.