

June 18, 2020

The Honorable Roger Wicker
Chairman
Committee on Commerce, Science
and Transportation
U.S. Senate
Washington, D.C. 20510

The Honorable Maria Cantwell
Ranking Member
Committee on Commerce, Science
and Transportation
U.S. Senate
Washington, D.C. 20510

The Honorable Frank Pallone, Jr.
Chairman
Committee on Energy & Commerce
U.S. House of Representatives
Washington, D.C. 20515

The Honorable Greg Walden
Ranking Member
Committee on Energy & Commerce
U.S. House of Representatives
Washington, D.C. 20515

Dear Chairmen Wicker and Pallone and Ranking Members Cantwell and Walden:

At a hearing before the Senate Commerce Committee earlier this week, Commissioner Mike O’Rielly said in response to a question from Chairman Wicker that NTIA not long ago had a different view on Ligado’s FCC application than the one it has recently expressed. Commissioner O’Rielly indicated that the NTIA’s current position is inconsistent with the one reached and held by the engineers and experts at NTIA prior to changes in political personnel there. We at Ligado have known this to be true for some time based on our direct discussions with the NTIA about our application. What is not well understood is that the Department of Defense’s Chief Information Office (DoD-CIO) also concluded that Ligado’s spectrum plan did not present any harm to GPS devices, and indeed had shared this view with the NTIA and the Federal Communications Commission, and signaled that the experts at NTIA, DoD-CIO and the FCC were on the same page: Ligado’s spectrum plan did not present harm to GPS devices.

This conclusion was conveyed to Ligado directly in multiple discussions between Ligado and DoD personnel. In addition, evidence supporting these statements is attached. First is a remarkable note that Ligado received shortly after the FCC announced its decision from a high-ranking official in the DoD-CIO. It states:

The unanimous, bipartisan vote by the FCC is keenly obvious proof to any who are truly informed or were honest assessors of the engineering and regulatory soundness of this final determination, albeit so very long in arriving.

Since 2015 when all of the major commercial GPS manufacturers filed to the FCC that their GPS operations could accommodate the revised Ligado proposal, and soon after in 2016 when I witnessed the Air Force's weak weeklong testing at the White Sands Missile Range, I repeatedly and incrementally advised DoD leaders of the inexorable writing on the wall towards a likely ultimate FCC determination as yesterday or comparable. During the entire calendar year of 2017, I was the DoD lead within the NTIA and FCC supervised All Agency Tech Focus Group that comprehensively analyzed all [of the] existing data to that date.

However, the real DoD GPS spectrum bottom line is that DoD GPS by doctrine and design operates majorly on its own military L2 signal far, far away at 1227 MHz, and also but only in minor part with the other civil L1 C/A signal far enough away at 1575 MHz. The DoD and US Military have not significantly relied upon the legacy GPS L1 signal at 1559 MHz for years; in now starkly obvious retrospect the DoD most probably never have waged any federal regulatory battles over the Ligado matters, certainly not since 2015 or 2016, and as I forecast so many times to DoD leaders the FCC has finally, deservedly, unanimously publicly repudiated them.

This last point is perhaps the most troubling. The “GPS L1” signal is the band that is 23 megahertz away from Ligado and is purportedly the basis for DoD’s stated concerns, and yet this senior ranking DoD-CIO official states what others have known for years: **“The DoD and US Military have not significantly relied upon the legacy GPS L1 signal [i.e., the signal that DoD argues is affected by Ligado’s spectrum plan] for years”**

It was widely known inside the Pentagon in 2018 that the DoD-CIO had concluded, based on the reasons outlined above, that Ligado’s spectrum plan presented no potential for harm to the U.S. Military’s GPS devices. Attached are emails from 2018 between Air Force personnel and the other services on the question of Ligado’s spectrum plan, and the email chain opens with a statement:

DoD CIO intends [to] support an NTIA/FCC proposal to allow Ligado Networks (formerly LightSquared) to begin initial deployment of their network employing a 9 - 13 dBW signal with an intention to eventually increase the power to 32 dBW.¹

In response to this request from the Air Force to join them in opposing the DoD-CIO position solely on the basis of the metric of 1dB, a Navy official promptly responds:

We cannot support the position paper.

The Navy official explained its position on the grounds that “[t]here is no analytical rigor in the paper. It just lists regulations, no mention of what Ligado might potentially do to out of band receivers.” The reference to “out of band receivers” is important, since this official acknowledges what the current occupants in DoD-CIO now conveniently ignore: there is no evidence that Ligado would cause harmful interference to GPS receivers operating in their own band. Instead, the entire debate is whether Ligado would cause harmful interference to GPS devices that are operating where they do not belong, and the FCC concluded that even those GPS devices would not experience harmful interference.

The evidence also shows that there was disagreement inside DoD about the adequacies of 1 dB as a metric and some DoD officials internally urged the DoD to abandon that view. As quoted in the attached story, the DoD CIO’s office stated as early as 2015 that it was “very concerned that bunkering down with this [1 dB] criteria as the only thing we are willing to explore or verify is a losing proposition, especially since we have both NTIA and FCC not supporting.”

We also want to bring to your attention a statement at the Commerce hearing from a Department of Transportation witness. Joel Szabat, nominee to the DoT Under Secretary of Transportation for Policy, stated that while DoT’s testing using the 1 dB metric showed there could be impact on high precision surveying equipment, (a point the FCC’s Order closely considered and rejected as baseless), even he had to concede this critical point:

So, we believe that cellular services and certified commercial aviation services by our testing would not receive harmful interference.

* * *

¹ (footnote added to text). Ligado did not intend to increase the signal to 32 dBW and repeatedly made that clear to DoD-CIO. Instead, it proposed a level of 9.8 dBW for the band closest to GPS and the FCC’s April 2020 Order established 9.8 dBW as the maximum power level.

The FCC's 72-page Ligado Order methodically analyzed the record, including all the evidence and arguments put forth by DoT and NTIA and other stakeholders, and concluded that the proposed spectrum plan was in the public interest and would not harm GPS devices. Though some at DoD now profess surprise at this decision, the attached documents make clear that the spectrum experts at DoD CIO and NTIA had long ago concluded that the testing, the science, and the law dictate that result.

Sincerely,



Valerie Green
EVP, Chief Legal Officer

Attachments

cc: Senate Armed Services Committee
House Armed Services Committee
Sen. John Thune, Chairman, Senate Subcommittee on Communications, Technology, Innovation, and the Internet
Sen. Brian Schatz, Ranking Member, Senate Subcommittee on Communications, Technology, Innovation, and the Internet
Rep. Michael F. Doyle, Chairman, House Subcommittee on Communications and Technology
Rep. Robert E. Latta, Ranking Member, House Subcommittee on Communications and Technology

Subject: RE: FCC unanimously approved Ligado license mod for 5G IoT and PS

Date: Tuesday, April 21, 2020 at 10:49:51 PM Eastern Daylight Time

From: [REDACTED] OSD DOD CIO (USA)

To: [REDACTED]
[REDACTED]

Firstly, since we haven't communicated for a while, I hope you and yours are faring well enough during the ongoing COVID national emergency, as my family and I are.

As a [REDACTED] I would like to convey my personal congratulations to you and your Ligado associates upon your successful license modification by the FCC yesterday. Hopefully, the DoD as agency in near future should also offer your company some official rapprochement since the final US Gov't authority over this matter has ruled. Once, that is, my DoD senior bosses maybe get over being gob smacked that this actually finally happened, Lol.

The unanimous, bipartisan vote by the FCC is keenly obvious proof to any who are truly informed or were honest assessors of the engineering and regulatory soundness of this final determination, albeit so very long in arriving. The additional public praise by the Administration's two most influential Cabinet Secretaries, Secretary of State Pompeo and Attorney General Barr, is thunderous within the Interagency. The Dept. of Homeland Security today as you probably know has smartly officially accepted the FCC decision as final. The Pentagon E-ring senior leaders are still as of this evening working through their stages one or two of the Kubler-Ross five stages of grief :-D Since last week when Mr. Pai first announced his intent to approve, I have been unpopularly analytically advising in a maelstrom of Pentagon emails, that the DoD will look only increasingly and embarrassingly out of touch with reality and legality if it persists in public protestations against this FCC decision.

In small measure, I am savoring your and the FCC's result yesterday as also a vindication of my technical and regulatory acumen within DoD in analyzing this over the past several years. You have no idea how many DoD and Air Force senior executives and military officers repeatedly have disparaged or tried to fire or marginalize me at Pentagon (mostly foolishly and fecklessly, so mostly pathetically) as a pariah or a Cassandra within DoD and the Interagency for my merely insisting upon full and fair due diligence analyses and reporting about all of the pertinent technical and regulatory data.

Since 2015 when all of the major commercial GPS receivers manufacturers filed to the FCC that their GPS operations could accommodate the revised Ligado proposal, and soon after in 2016 when I witnessed the Air Force's weak weeklong testing at White Sands Missile Range, I repeatedly and incrementally advised DoD leaders of the inexorable writing on the wall towards a likely ultimate FCC determination as yesterday or comparable. During the entire calendar year of 2017, I was the DoD lead within the NTIA and FCC supervised All Agency Tech Focus Group that comprehensively analyzed all the of existing data to that date.

Increasingly more so in 2018 and 2019 and recent months, I repeatedly attempted to explain within DoD, as [REDACTED]

[REDACTED] that the Ligado revised lower power levels for Narrowband 5G IoT and Public Safety (PS) applications proposed a very feasible, timely and astute industry market shift; particularly advantageous as combined with Ligado's existing satellite assets and operating experience, which of course is why Verizon and T-Mobile in 2019 had publicly announced 5G partnering plans with Ligado contingent on the FCC approval.

Ready-to-deploy, innovative 5G IoT and PS infrastructure and services are simply too important to the US economy and our citizens and businesses and civil agencies, in my federal and [REDACTED] opinion, to not be honestly and wisely balanced with military and federal concerns, and not be obstructed by closed-minded bureaucratic luddites, or false flag wavers --- now more than ever as so many US businesses and tens of millions of our fellow citizens are unemployed and vitally need to climb back from the COVID shutdown.

As a long ago [REDACTED] officer of [REDACTED] active duty, much of which served [REDACTED]

[REDACTED], I cut no slack compared to anyone at Pentagon or the Interagency about actual military or national security. However, the real DoD GPS spectrum bottom line is that DoD GPS by doctrine and design

operates majorly on its own military L2 signal far, far away at 1227 MHz, and also but only in minor part with the other civil L1 C/A signal far enough away at 1575 MHz. The DoD and US Military have not significantly relied upon the legacy GPS L1 signal at 1559 MHz for years; in now starkly obvious retrospect the DoD most probably never have waged any federal regulatory battles over the Ligado matters, certainly not since 2015 or 2016, and as I forecast so many times to DoD leaders the FCC has finally, deservedly, unanimously publicly repudiated them.

So again, my bravo zulu salute on your FCC result yesterday, and good luck and good hunting with your upcoming services which I see as beneficial to our national and public interests. I thought you might like to know that there were and are at least some at the DoD who had knowledgeably and strongly supported the Interagency processes for the FCC making a full and fair technical and regulatory determination.

P.S. Please don't lose all other faith in the DoD, we do otherwise often and very well perform quite a lot of proper services for the United States and our people and our allies !

Regards,

[REDACTED]

[REDACTED]

OSD / DoD CIO

[REDACTED]

[REDACTED]

[REDACTED]

From: Flahive, Matthew P Lt Col USAF SAF-SP (US)
Sent: Friday, March 16, 2018 5:50 PM
To: Mccobb, Douglas F Jr Col USAF SAF-SP (US)
Cc: Bakotic, Kristen D Lt Col USAF SAF-OS (US)
Subject: RE: Sister Service Support for an Official USAF Position on GPS Spectrum Protect
Signed By: matthew.flahive@us.af.mil

Col McCobb,

I showed the Navy's concern to Dr. Stopher, and he said it is not something that SecAF should bring up at the breakfast on Monday.

v/r
Matt

MATTHEW P. FLAHIVE, Lt Col, USAF
Executive Officer for Dr. John Stopher
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matthew.p.flahive.mil@mail.smil.mil
matthew.flahive@af.ic.gov

-----Original Message-----

From: Mccobb, Douglas F Jr Col USAF SAF-SP (US)
Sent: Friday, March 16, 2018 5:03 PM
To: Flahive, Matthew P Lt Col USAF SAF-SP (US)
<matthew.p.flahive.mil@mail.mil>
Cc: Bakotic, Kristen D Lt Col USAF SAF-OS (US)
<kristen.d.bakotic.mil@mail.mil>
Subject: FW: Sister Service Support for an Official USAF Position on GPS Spectrum Protection

Matt,

Based on what I get back from Milt and Christine....we may have to have Dr Stopher raise this to SecAF for Monday's meeting with the other service secretary's....we need all three Services to agree that on this issue.

dfm

-----Original Message-----

From: Memmen, Sean P. CAPT OPNAV [mailto:sean.memmen@navy.mil]
Sent: Thursday, March 15, 2018 9:47 AM
To: Clary, Milton R CTR USAF (US) <milton.r.clary.ctr@mail.mil>; Roseberry, Craig S COL USARMY HQDA (US) <craig.s.roseberry.mil@mail.mil>; Berroyer, Caroline S Lt Col USAF JS J6 (US) <caroline.s.berroyer.mil@mail.mil>;

Kunkel, Levi E Capt C4, C4 <levi.kunkel.ctr@usmc.mil>
Cc: Sapp, Joseph W II CTR USAF (US) <joseph.w.sapp4.ctr@mail.mil>; Anderson, Scott W Lt Col USAF (US) <scott.w.anderson14.mil@mail.mil>; Barnes, Shawn J SES USAF (US) <shawn.j.barnes.civ@mail.mil>; Pooley, David F CIV USAF AFSPC A6 (US) <david.pooley@us.af.mil>; Mccobb, Douglas F Jr Col USAF SAF-SP (US) <douglas.f.mccobb.mil@mail.mil>; Anton, John P CTR USAF SAF-SP (US) <john.p.anton.ctr@mail.mil>; Johnson, David M CIV USN CNO (US) <david.m.johnson4@navy.mil>; Hunter, Peter A CTR USN DCNO N2N6 (US) <peter.hunter@navy.mil>
Subject: RE: Sister Service Support for an Official USAF Position on GPS Spectrum Protection

Milt,

We cannot support the position paper.

Specifically..

1. There is no analytical rigor in the paper. It just lists regulations, no mention of what Ligado might potentially do to out of band receivers.
2. The statement on the second page "Initial queries to Army and Navy indicate support for the Air Force position to oppose the DoD CIO/FCC/NTIA proposal." Navy's position is we concurred that 1 dB C/N is the acceptable international limit.

V/R,
M&M

-----Original Message-----

From: Clary, Milton R CTR USAF (US) [mailto:milton.r.clary.ctr@mail.mil]
Sent: Tuesday, March 13, 2018 6:23 PM
To: Memmen, Sean P. CAPT OPNAV <sean.memmen@navy.mil>; Roseberry, Craig S COL USARMY HQDA (US) <craig.s.roseberry.mil@mail.mil>; Berroyer, Caroline S Lt Col USAF JS J6 (US) <caroline.s.berroyer.mil@mail.mil>; Kunkel, Levi E Capt C4, C4 <levi.kunkel.ctr@usmc.mil>
Cc: Sapp, Joseph W II CTR USAF (US) <joseph.w.sapp4.ctr@mail.mil>; Anderson, Scott W Lt Col USAF (US) <scott.w.anderson14.mil@mail.mil>; Barnes, Shawn J SES USAF (US) <shawn.j.barnes.civ@mail.mil>; Pooley, David F CIV USAF AFSPC A6 (US) <david.pooley@us.af.mil>; Mccobb, Douglas F Jr Col USAF SAF-SP (US) <douglas.f.mccobb.mil@mail.mil>; Anton, John P CTR USAF SAF-SP (US) <john.p.anton.ctr@mail.mil>
Subject: Sister Service Support for an Official USAF Position on GPS Spectrum Protection

Sir/Ma'am,

The National Positioning, Navigation and Timing Executive Committee (Nat'l PNT EXCOM) meets on 22 March to establish a national position on power limits for terrestrial broadband transmissions within Mobile Satellite Services (MSS) spectrum adjacent to GPS L1. DoD CIO intends support an NTIA/FCC proposal to allow Ligado Networks (formerly LightSquared) to begin initial deployment of their network employing a 9 - 13 dBW signal with an intention to eventually increase the power to 32 dBW. Adjacent Band

Compatibility (ABC) tests conducted by DOT and the Air Force determined that a majority of GPS applications will be seriously degraded if the established spectrum limit of 1 dB Carrier-to-Noise (C/No) is abandoned in favor of a less stringent standard that DoD CIO's policy change would require.

The attached draft position paper will begin formal coordination within the Air Force very soon and will be signed by Secretary Wilson and forwarded to the Deputy Secretary of Defense. In a nutshell, the AF position is that established protection limits for GPS spectrum must be adhered to if the Air Force is to uphold its responsibility for global stewardship of GPS. Last January the Army and Navy expressed their support of an Air Force position that would maintain internationally accepted limits of 1 dB C/No for GPS spectrum. Since it is highly probable that Secretary Wilson will reach out her Army and Navy counterparts, LtGen Shwedo directed me to come back to the Army and Navy PNT experts and request that you obtain your Service's support for our position at the highest level practical (Flag level if possible). LtGen Shwedo also instructed me to reach out to the Joint Staff and Marine Corps with the same objective. Having our Sister Services on board will strengthen Secretary Wilson's hand when she engages with the DepSecDef.

By way of reference, PM-PNT (LTC Rojas) replied with following response: "Recommendation: Army is in line with Air Force on this. Light-squared/Legato will _kill_ GPS L1 for any receiver currently in production (and likely for future devices as well)." and the Deputy Navigator of the Navy responded "Navy concurs with USAF WRT 1dB interference".

Establishing an Air Force position is a very high priority within the Air Force. I am reluctant to unleash my emergency onto your organizations but I think you will agree that defending DoD equities is in all our best interests.

Very Respectfully,

Milt Clary

Milton R. Clary
Air Force Space Command - Forward
1E935
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(SIPR) milton.r.clary.ctr@mail.smil.mil
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UFOs May Be Real But A11 Does Not Exist

Communications Daily

Ligado in the Balance

Emails Show Federal Disagreements on Protection Standard for GPS TOP NEWS | 5 Nov 2019 | Ref: 1911040057 | by Howard Buskirk

Emails between the Office of the DOD Chief Information Officer and the Positioning, Navigation and Timing (PNT) office within the Department of Transportation raise new questions about the government's stance on what some consider an overly conservative emissions standard to protect GPS -- 1 dB. In emails from 2015 we obtained, DOD officials discussed whether that standard is necessary.

The FCC recently sent an order addressing Ligado's licensing applications to NTIA for the Interdepartment Radio Advisory Committee (IRAC) to scope (see 1910300050). The Ligado applications have been before the FCC for nearly four years. Ligado maintained in various filings at the FCC that 1 dB is not a "standard" and the FCC and NTIA never used the 1 dB metric in the context of adjacent band emissions. Officials said the only power levels that would satisfy the criterion are at an extremely low Bluetooth-level.

Ligado and rules to protect GPS have long been an issue. If the Pentagon ultimately insists on a 1 dB standard it could potentially render some bands unusable for commercial operations, particularly 1.3 GHz, targeted for reallocation by NTIA, industry officials say (see 1812110057). DOD and DOT didn't comment.

A senior official from the DOD CIO's office was "very concerned that bunkering down with this criteria as the only thing we are willing to explore or verify is a losing proposition, especially since we have both NTIA and FCC not supporting," said a key email from the CIO's office to PNT. "We have to do our due diligence and explore other options and if we ultimately come back to this criteria as the best way to protect GPS then so be it," the email said. "But to say we will not explore other options because in the past it was supported is not good strategy." The email argues DOD must be "much more strategic in how we go about doing this."

A PNT official urged a "firm" federal line, in an email to DOD from the same time period. The 1 dB limit is the "standard protection criteria for GPS used internationally, and that NTIA and FCC supported in the past," the PNT official said. "Lots of IRAC activity and DoD spectrum work galvanized the federal community on this and there are no valid technical or policy reasons I can think of to warrant a change now."

A second set of emails indicates that in 2013 an official working for DOD's CIO told key Hill staff the department had no objections to the uplink bands and the upper downlink being used by Ligado.

"GPSIA and its members continue to recognize that spectrum management should employ the internationally established criteria of a 1 dB decrease in Carrier-to-Noise Ratio as an interference protection criterion," emailed David Grossman, executive director of the GPS Innovation Alliance: "The 1 dB standard provides the most readily identifiable and predictable metric that will ensure a harmful interference level is prevented in the first place, so that systems operating in the same or adjacent bands do not interfere with one another."

In a report last week, New Street noted the Ligado order is now apparently before IRAC. "After a decade of being sidelined due to complaints from the GPS community, the industry would no doubt welcome seeing this spectrum repurposed," New Street told investors: "Moreover, it could be released for terrestrial use at an interesting time; Ligado has been testing use cases in which the spectrum is paired with higher frequency bands to improve their propagation."

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