13 September 2022

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
45 L Street, NE
Washington, DC 20554

Re: In the Matter of WT Docket No. 19-116, Allocation Rules for the 1675-1680 MHz Band; RM-11681 "Petition [by Ligado Networks] for Rulemaking to Allocate the 1675-1680 MHz Band for Terrestrial Mobile Use"; IB Docket No. 12-340 "LightSquared Request to Modify Its ATC Authorization."; IB Docket No. 11-109, Regarding the Ligado Modification Applications

Dear Ms. Dortch,

The undersigned weather, water, Earth science and aviation related organizations are in strong support of the analysis and recommendations[1] within the recently released "Spectrum Pipeline Reallocation 1675–1680 MHz Engineering Study (SPRES) Program Report."[2]

Our organizations and members rely on real-time data services from NOAA's Geostationary Operational Environmental Satellite (GOES) between 1675 and 1695 MHz for critical early warning of severe weather, floods and wildfires, as well as important information for marine transportation, aviation, agriculture and numerous other weather-dependent industries.

As stated in the SPRES report, our organizations know the proposed sharing of the 1675-1680 MHz band carries substantial risks.[3] As noted in past comments from our organizations and other science focused entities, the GOES Rebroadcast (GRB)[4] and Data Collection System (DCS)[5], which includes the Data Collection Platform Relay (DCPR), play numerous discrete roles in supporting an array of environmental forecasting with significant economic impacts.[6]

- For example, the U.S. Army Corps of Engineers (USACE) relies heavily on DCS-enabled stream gages for real-time data about river and reservoir levels throughout the United States, information that is used to manage an extensive system of locks and dams. USACE also uses DCS-enabled stream gages to report the water depth in the nation's inland navigation channels, which transport commodities destined for export. The average national economic development benefits of USACE programs reliant on DCS totals $126.4 billion (in 2016 dollars).[7]

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[1] The signatories on this letter take exception to the statements in the "Foreword" to the report (and the summary of the general findings in the NTIA cover letter) since the interpretations presented seem markedly different from the main report and are inconsistent with the views expressed in the report that indicate sharing of 1675-1680 MHz will present significant, if not extreme, risk to real-time GOES data services.

[2] U.S. Department of Commerce. National Oceanic and Atmospheric Administration. National Environmental Satellite Data Information Service. Spectrum Pipeline Reallocation 1675–1680 MHz Engineering Study (SPRES) Program Report. Silver Spring, MD: NESDIS, October 2020. (public release August 2022.) https://doi.org/10.25923/pqkt-m336.

[3] Ibid p 3.

[4] The GRB system enables real-time transmission of sensor data from NOAA's GOES satellites that is robust in the most severe weather situations, and not impacted by power and internet outages that are frequent in emergencies when information matters most to saving lives and property, especially during hurricanes.

[5] DCS is a relay system used to collect information from earth-based platforms that can be placed in remote locations and left to operate with minimal human intervention, and has great, diverse and remote geographic distribution across the Americas and its surrounding oceans.

[6] Ibid. p 46-62.

[7] Ibid. p 47.

- The National Interagency Fire Center uses specialized DCS platforms for the collection of near-real-time meteorological data in remote areas to monitor fire danger and to manage fire risks. These specific platforms protect the lives of firefighting personnel, and interference to the reception of this data can place firefighters' lives at risk.
- The National Weather Service's Alaska Aviation Weather Unit depends on DCS-received data to issue warnings about volcanic ash to airplanes that overfly the north Pacific, one of the most active volcanic regions on the planet. About 10,000 people per day and up to 50,000 aircraft per year traverse the coverage area, which includes most flights to/from the western United States to Asia. These DCS products provide significant value to aviation related industries. [8]

The SPRES report indicates that satellite receivers operated by users of NOAA satellite data would likely incur radio frequency interference (RFI), resulting in loss of data. The consequences of such interference would be harmful and costly.[9] Loss of critical information during a severe weather event would impede the ability of the National Weather Service (NWS), the Department of Defense (DoD), and other Federal, state, and local organizations to generate advance warnings, appropriately warn affected populations, and could result in significant property damage and loss of human life.[10]

As noted in the past, our communities are supportive of 5G, and produce some of the most used apps in the world.[11] But considering both the AWS-3 auction of 1695–1710 MHz and the 2003 auction of the 1670–1675 MHz band, though, NOAA has already made available half of the original 1670-1710 MHz meteorological satellite (Met-Sat) allocation (20 MHz of the original 40 MHz) for wireless broadband. The proposed additional sharing from 1675-1680 MHz is simply a step too far.

The SPRES report examined a range of mitigations, including alternatives to the GRB and DCS broadcasts. Following a comprehensive exploration, there were no terrestrial distribution solutions that met the requirements, functionality, and performance of existing systems.[12] This is consistent with an earlier *Ex Parte* written submission by some of the undersigned organizations that included an analysis of possible cloud delivery network specifications.[13] The GRB requirements limit outages to not exceed five minutes every 30 days, equaling a 99.988% service availability target, while commercially available services cannot guarantee less than 20 minutes of outage per month, closer to 99.93%, when also adjusting for terrestrial "last mile" internet delivery. This further reinforces that the proposed content delivery network (CDN) proposed by Ligado Networks, LLC ("Ligado") is not a viable option for users of these critical data streams.

If sharing of 1675-1680 MHz is allowed to go forward with unfettered use of terrestrial services, costly ground architecture changes would be needed. Additionally, a network redesign could involve satellite changes and potential modifications to modify or replace 40,000 DCS platforms, as detailed in the SPRES

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[8] Air Transport Action Group, "Aviation: Benefits Beyond Borders", global report. https://aviationbenefits.org/downloads/aviation-benefits-beyond-borders-2020/

[9] U.S. Department of Commerce. National Oceanic and Atmospheric Administration. National Environmental Satellite Data Information Service. Spectrum Pipeline Reallocation 1675–1680 MHz Engineering Study (SPRES) Program Report. Silver Spring, MD: NESDIS, October 2020. (public release August 2022.) https://doi.org/10.25923/pqkt-m336.
. p 2.

[10] Ibid. p 3.

[11] 20 June 2016 filing in RM 11681. AccuWeather. https://www.fcc.gov/ecfs/file/download/DOC-555d219453400000-A.pdf?file_name=AccuWeather_FCC_Letter_6.20.2016.pdf

[12] U.S. Department of Commerce. National Oceanic and Atmospheric Administration. National Environmental Satellite Data Information Service. Spectrum Pipeline Reallocation 1675–1680 MHz Engineering Study (SPRES) Program Report. Silver Spring, MD: NESDIS, October 2020. (public release August 2022.) https://doi.org/10.25923/pqkt-m336.
p 25

[13] https://ecfsapi.fcc.gov/file/104132285323927/FCC_AMS_AGU_SSEC_Feedback_April_2017.pdf

report.[14] Concepts to provide limited protection zones would not necessarily include all current direct readout ground station (DRGS) locations for users who require the direct reception to meet their operational needs. This is unacceptable at a time when hazards related to severe weather and flooding are increasing. For the safety of the public and critical infrastructure around the U.S., the sharing of 1675-1680 MHz simply cannot be allowed.

The SPRES report states, "Unlike GRB, DCS is a relay of the original source data rather than a rebroadcast. This means any interference results in permanent loss of this data."[15] Allowing in-band sharing within 1675-1680 MHz, would provide no mitigation for interference using filtering techniques.

The detailed analysis presented in the SPRES report, paired with the information in numerous *Ex Partes* by our and other science focused organizations, provides a clear basis of evidence suggesting that claims by Ligado that their proposed system will not harm environmental data users are false. Added to the evidence presented by the GPS, satellite communications and other related industries about other Ligado efforts to conduct terrestrial operations in the L-band,[16] the SPRES report reinforces the need for the FCC to prevent any further consideration of the Ligado proposal to share 1675-1680 MHz, and stay the April 2020 FCC decision authorizing operation of a terrestrial radio network near the GPS frequency bands.

We understand the FCC's interest in advancing spectrum sharing for the future but believe our long-stated concerns and the evidence provided in the SPRES report should signal a significant warning. The FCC should vacate its efforts to proceed with final rulemaking in the 1675-1680 MHz radio spectrum. Thank you for the opportunity to represent our organizations and comment on this issue of importance to the safety and wellbeing of society.

Sincerely,

AccuWeather, Inc.
Air Line Pilots Association, International
ALERT Users Group
American Geophysical Union (AGU)
American Meteorological Society (AMS)
American Weather and Climate Industry Association (AWCIA)
GeoOptics, Inc.
National Weather Association
Microcom Environmental
PlanetIQ
The Semaphore Group
Space Science and Engineering Center at University of Wisconsin-Madison
University Corporation for Atmospheric Research (UCAR)

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[14] U.S. Department of Commerce. National Oceanic and Atmospheric Administration. National Environmental Satellite Data Information Service. Spectrum Pipeline Reallocation 1675–1680 MHz Engineering Study (SPRES) Program Report. Silver Spring, MD: NESDIS, October 2020. (public release September 2022.) https://doi.org/10.25923/pqkt-m336. p 403.

[15] Ibid p 8.

[16] National Academies of Science, Engineering and Medicine, "Analysis of Potential Interference Issues Related to FCC Order 20-48", https://nap.nationalacademies.org/catalog/26611/analysis-of-potential-interference-issues-related-to-fcc-order-20-48