

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)	
)	
Request of Ligado that the Commission)	
Initiate a Rulemaking to Allocate the)	RM-11681
1675-1680 MHz Band for Terrestrial Use)	

COMMENTS

Lockheed Martin Corporation (“Lockheed Martin”) has been a long-term provider of systems for environmental intelligence used by NOAA and other federal agencies. Accordingly, we welcome the opportunity to provide comments on the FCC’s above-referenced Public Notice regarding Ligado’s request that the Commission initiate a rulemaking to allocate the 1675-1680 MHz band for shared use.¹ At this time, Lockheed Martin believes it is premature to grant Ligado’s petition. However, Lockheed Martin also believes that there is analysis that can and should be conducted by NOAA to determine the feasibility of a path forward.

Ligado seeks to add a commercial terrestrial wireless allocation to a portion of the L-band spectrum in which NOAA’s meteorological satellites operate in order to provide critical information to federal, civilian, and commercial users. Commercial wireless access to the 1675-1680 MHz band would, by Ligado’s own admission, cause interference at free-access, receive sites² – thereby resulting in corrupted or lost weather image products that are used by meteorologists nationwide for forecasting. No regulatory action by the FCC should permit the risk of loss of critical weather products.

I. Current and Future Applications of Critical Weather Infrastructure in the 1675-1680 MHz Band Are Threatened

The service that appears most susceptible to interference in a shared-use paradigm is the existing GOES-Variable (GVAR) broadcast from the NOAA GOES 13, 14, and 15 spacecraft, and, in the future, the follow-on GOES-R Rebroadcast (GRB). The investment to date in satellite hardware and software to support GRB is on the order of millions of dollars per spacecraft. Ground system investments are also large.

Lockheed Martin has significant expertise in both GVAR and GRB direct-readout systems, having developed, deployed, and maintained such systems for the U.S. Air Force (USAF) for over 15 years. The system, known as Mark IV-B, includes image processing and

¹ *Comment Sought to Update the Record on Ligado’s Request that the Commission Initiate a Rulemaking to Allocate the 1675-1680 MHz Band for Terrestrial Mobile Use Shared with Federal Use*, Public Notice, DA 16-443 (rel. Apr. 22, 2016).

² See *Ex Parte* presentation and Attachments of LightSquared Subsidiary LLC, RM-11681 (Apr. 14, 2014).

analysis software and restricted image product sharing capabilities across all USAF sites. Today, multiple USAF Mark IV-B sites receive data for critical aviation weather analysis and tactical forecasting use. These Mark IV-B systems are in the process of being upgraded for receipt of the future, much larger GRB stream from GOES-R/S/T/U. Delivery of these systems to the USAF is anticipated shortly after the November 2016 launch of GOES-R.

The GRB stream, like the GVAR downlink today, will provide real-time weather image data at the lowest latency possible for operational use by meteorologists. In a forecast setting, the immediate availability of such images is critical to making short-fused decisions about weather warnings. Interference on this downlink will result in missing or corrupted images of important weather phenomena (*e.g.*, dust storms, volcanic ash, cloud icing).

Beyond Lockheed Martin's Mark IV-B system for the USAF, several other commercial companies have spent internal research and development funds to develop marketable GOES-R GRB product systems. To date, well in advance of the GOES-R launch, some of these systems have been purchased and put into place by both commercial and government users, from private forecasting companies to the U.S. Navy. The commercial market for these receive systems is anticipated only to grow as the advanced capabilities of GOES-R are demonstrated.

Any risk to timely, accurate weather-dependent operational decisions resulting from lost data would be unacceptable, whether for the federal government or for the private-sector weather enterprise. The question then becomes if such risks should be considered at all, and, if so, how such risks can be mitigated in a proposed shared-use scenario.

II. NOAA Should Be Responsible for Analyzing the Feasibility of the Ligado Proposal

Ligado requests information on the non-federal users of NOAA data, and also proposes a completely alternative approach to today's direct readout of GVAR and tomorrow's GRB – specifically, it proposes to substitute a terrestrial-based architecture. Lockheed Martin has examined Ligado's proposed alternative approach, the "GRB-T Private Cloud Content Delivery Network," or CDN, for the weather enterprise.

While there may be some positive features of the CDN, we believe it is an incomplete solution to the problem as it is neither robust, nor does it offer a long-term viable solution for the entire weather enterprise. In fact, if the FCC were to act on the proposal as presented by Ligado, it would in effect be overturning the U.S. Government's long-term commitment to free-and-open access of direct weather data. Furthermore, we believe that NOAA, as the responsible federal agency for the mission to provide global environmental observations from space, is the appropriate agency, in concert with the larger weather enterprise, to articulate and determine the requirements of an acceptable alternative system. Any consideration of a system that would overturn the U.S. Government's 40-year practice of free-and-open direct satellite broadcast must only be based upon a comprehensive study of impacts to the entirety of the weather enterprise, undertaken by the agency responsible for the mission.

To that end, Lockheed Martin strongly supports the goal of having NOAA study the feasibility of alternative architectures for real-time distribution of weather products. We believe, furthermore, that only NOAA can provide such an analysis, taking into consideration the needs of, and impacts on, the weather enterprise, while also possibly proposing alternative solutions. We would also encourage the FCC to support any NTIA efforts to ensure that NOAA is able to access expeditiously the research and development funding available through the Commercial Spectrum Enhancement Act (CSEA) to conduct its own thorough study to determine whether an acceptable terrestrial based alternative is even viable to meet the needs of the weather enterprise.

CONCLUSION

For these reasons, Lockheed Martin finds it premature to proceed with an FCC rulemaking to consider allocating the 1675-1680 MHz band for terrestrial mobile operations within the current federal primary use allocation that supports critical weather infrastructure.

Respectfully submitted,

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