



October 5th 2018

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, D.C. 20554

Re: Ligado License Modification Applications and Amendment
IBFS File Nos. SES-MOD-20151231-00981, SAT-MOD-20151231-00090, and
SAT-MOD-20151231-00091; IB Docket No. 11-109

Dear Ms. Dortch:

Septentrio is a leading worldwide designer and manufacturer of high-end multi-frequency GNSS receivers and surveying equipment. We design, manufacture and sell highly accurate GPS/GNSS receivers, for demanding applications requiring accuracies in the decimeter or centimeter range, even under difficult conditions. Whether it's on the high sea, in scintillation prone areas or at high latitudes, our receivers deliver fast, accurate and reliable positions.

GNSS receivers operate with very weak signals, and are inherently vulnerable to a variety of disturbances, whether natural or man-made, whether intentional or unintentional. Interference, jamming and spoofing are an important category of such disturbances, a category which is continuously growing in importance as spectrum gets more crowded, use of GNSS receivers proliferates dramatically in number and takes a more and more prominent role in more and more applications.

For well over 10 years, Septentrio has been driven by customers to develop technology to make its receivers robust against the interference and jamming events they were facing. More recently, various other players in the industry have picked up this challenge. Developing receivers to be robust against all forms of interference has become an important theme in the GNSS industry.



Septentrio hardware and Ligado services are complementary. Septentrio has worked with Ligado to refine certain of Ligado's high-precision offerings. We are aware of Ligado's proposed operating parameters and have reviewed them against our existing and continuously evolving technology to protect GNSS receivers against a variety of disturbances. Ligado's proposed operating parameters fall within the type of interference GNSS receiver can be immune to by design. In fact, we are pleased to be able to distinguish ourselves in the market on the fact that our precision receivers are designed and have proven to be robust in challenging RF environments, including with respect to terrestrial adjacent band emissions. They need to be, not just to cope with Ligado's signals, but with many other forms of accidental or structural signal transmissions adjacent to the GNSS bands.

Ultimately, these robust GNSS receiver technology capabilities enable wider and safer adoption of GNSS, and benefit the entire public.

Respectfully submitted,

Neil Vancans

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