

From: Anne Linton

To: John Kennedy

Date: June 01, 2006

Subject:

FCC File # 0051-EX-RR-2006

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Message:

Mr. Kennedy,

In consultation with Novariant, we are responding below to your questions about pseudolites. If you have further questions, please let me know.

Thank you for your assistance.

Anne Linton

Novariant, Inc.

Response to Inquiry from FCC

0051-EX-RR-2006

1. ☐ Is there a pulse duration and pulse repetition rate at which pseudolites would begin to cause interference to GPS receivers? If so, what is that pulse duration and pulse repetition rate?

The answer to this question requires that we define "interference" to GPS receivers. As noted in our earlier filings, pseudolites transmit different C/A codes than the GPS satellites. So, the signals generated by pseudolites are not recognized or processed by a standard GPS receiver. In the doctoral thesis submitted by Dr. H. Stewart Cobb to the Stanford University Department of Aeronautics and Astronautics, he describes the 36 Gold Codes that are available to GPS. Dr. Cobb notes that 32 of those codes are assigned to GPS satellites, but 4 codes were specifically reserved for use by pseudolites, proving that there was an anticipated use of pseudolites and terrestrial communication on the L1 frequency.

Interference will not come from false positioning information. The pseudolites do not transmit false information, they transmit information that is simply rejected by a GPS receiver that is not specially modified to receive the pseudolite signal.

This brings us to the question of signal interference from a radio signal on the same frequency. With an array of pseudolites operating at a duty cycle of 40% or greater and the pseudolite power 10 db higher than the GPS satellite power, there is a chance that the radio noise from the array of pseudolites would interfere with the navigational ability of a GPS receiver. Novariant's experimentation does not envision creation of this extraordinary situation. It does not test combinations of high duty cycles and strong pseudolite power. Novariant's experiments with pseudolites specifically study the limits of pseudolite use to ensure that there is no interference with navigation using GPS. During those experiments, Novariant simultaneously operates its own GPS receivers to detect and prevent blockage of the GPS signals.

There is a trade off – the greater the duty cycle, the lower the power level that Novariant uses in its tests. So, in the rare event, and in accord with the current conditions on its license, when Novariant might engage in a continuous wave experiment, it coordinates with the FAA in