

Trimble Navigation Limited
Experimental License Request
File Number: 0768-EX-PL-2013

Explanation of Experiment

Background: Trimble Navigation Ltd's Mining Division has been working with Flint Hill Resources's refinery to test the use of its Terralite® System to address GPS outages due to ionospheric scintillation in Minnesota. In July, the FCC issued an STA, WG9XTS, to Trimble for experimental testing, which allowed Trimble to demonstrate in the short term that this system can work to provide augmentation when solar flares create GPS disruptions and to explore the parameters of for optimizing installation and reliable operation for a Terralite® System being used for this augmentation. Trimble is filing this request for an experimental license because its testing is not yet complete.

Nature of Experimentation: Trimble will be experimenting with various configurations for its installation to determine what, if any, modifications are needed to the technology embedded in the Terralite® System to allow it to withstand timing signal outages that result from ionospheric scintillation. The system is being tested to see if it can assist with autonomous vehicle operation at a refinery, using the Terralite system to solve issues created by ionospheric scintillation. Trimble's engineers are working on software upgrades and system integration to ensure that the Terralite system solve the GPS outage issues.

As part of their precision positioning, Terralites rely on GPS timing signals. However, in times of ionospheric scintillation, reception of those timing signals may be delayed, corrupted or even precluded. This test will allow Trimble to test, in a real-world environment, how well its embedded technology works to overcome scintillation, and it will highlight any additional technological advancements needed to ensure that the precision positioning needed for autonomous operation can be supplied by the Terralite System.

The testing will involve use of the Terralites in various configurations and patterns, with scheduled and unscheduled GPS outages incorporated into the system, to determine how to improve software within the system so that the system can provide precision positioning technology to autonomous vehicles that need constantly available position information.

The transmitters will be installed at a discrete location at the refinery in Rosemount, Minnesota. The power levels of the proposed transmissions are the minimum needed to allow for reliable signal coverage in the area to be covered by the array of Terralites (6 Terralite transmitters will be installed to ensure adequate coverage of the navigational area.) The transmit power is low, merely one watt, and the resulting ERP is merely 10 W.

Questions regarding this application should be directed to Alex R. Cortez, Worldwide Director, Trimble Mining Solutions, 520-309-5771 or alex_cortez@trimble.com.

In the unlikely event that operations need to be shut down immediately, the stop buzzer point of contact is: Ken Watterson: 520-784-3678; ken_watterson@trimble.com.