

TASK STATEMENT

Assessment of LightSquared Terrestrial Broadband System Effects on GPS Receivers Supporting Cellular and General Location/Navigation and Timing

REFERENCES:

1. FCC Order DA 11-133, in the matter of LightSquared Subsidiary LLC “Request for Modification of its Authority for an Ancillary Terrestrial Component,” adopted and released January 26, 2011
2. NTIA letter to FCC Chairman, dated January 12, 2011
3. NPEF Final Report, dated June 2, 2011
4. LightSquared Technical Working Group (TWG) Report, dated June 29, 2011
5. NTIA letter to EXCOM, received September 12, 2011
6. EXCOM letter to NTIA, dated October 5, 2011

SCOPE:

At the direction of the National Executive Committee for Space-Based Positioning, Navigation, and Timing, herein referred to as the EXCOM, and with facilitation by the National Coordination Office (NCO), the National Space-Based PNT Systems Engineering Forum (NPEF) is tasked to conduct an assessment of the effects of LightSquared’s planned deployment of terrestrial broadband systems to Global Positioning System (GPS) receivers. The NPEF should engage with: 1) LightSquared, and 2) GPS manufacturing and applications communities through relevant industry bodies. NTIA requests this test to be jointly planned with LightSquared.

The assessment should be focused on those receivers supporting applications that would fit into either the “Cellular” or the “General Location/Navigation” categories defined by the referenced TWG report. The scope is further focused on only the first phase of LightSquared deployment, which involves a single 10 MHz transmission (1526 – 1536 MHz). The NPEF should assume a maximum base station EIRP per sector of 32 dBW.

The NPEF may include other receivers in the test plan that do not fit into the categories identified by NTIA, but only if testing of these receivers does not extend past November 30, 2011. This testing may address noted deficiencies in the NPEF Final Report, dated June 2, 2011, to include testing of LightSquared handsets. If actual hardware is not available, the NPEF may simulate the devices to the best of their ability.

METHODOLOGY:

1. The methodology for this assessment will conform to NTIA standard definitions and metrics for assessing interference, to include interference thresholds and propagation models appropriate to the scenario considering broadband signal characteristics, transmit and receiver antenna characteristics. Identify user handset planning assumptions as appropriate. NTIA will review the NPEF test plan and ensure data collected supports their assessment criteria needs. NTIA’s technical point of contact is Mr. Ed Drocella.
2. The NPEF shall coordinate work plan, test planning, and field test activities with LightSquared, GPS device representative groups, NTIA, and EXCOM departments and agencies to measure emissions and determine representative technical and operational GPS receiver effects as a

function of distance from a LightSquared terrestrial base station. The NCO will facilitate this coordination. The NCO's technical point of contact is Mr. Knute Berstis.

3. As a minimum, the assessment needs to collect the following parameters for chamber testing:
 - a. P_T -- the power level of the LightSquared base station transmitter (dBm)
 - b. G_T -- transmit antenna gain of the LightSquared base station (dBi)
 - c. G_R -- GPS receive antenna gain (dBi) *
 - d. L_P -- Propagation loss
 - e. I_t -- Interference threshold based on the equivalent isotropically radiated power level ($P_T + G_T$) from the LightSquared base station transmitter required to cause a 1 dB increase in the GPS receiver noise. *
4. As time permits, provide preliminary potential mitigation techniques and their expected effectiveness/costs for various representative GPS receivers in each of the selected scenarios. Assessments should include analysis, simulation, and prototype testing (as practical).
5. Industry may participate in this testing. All data collected should be included in the final report. For purposes of the public, releaseable version of this report, it is acceptable to protect the vendor names similar to what was done in LightSquared's Technical Working Group. However, NTIA will be provided complete information on all items tested.

*Note: it may not be possible for complete characterization of GPS receiver antenna gain or to measure the interference threshold for all tested receivers. In cases where this information will not be available in the timeframe of the test, report what can be collected by the testing deadline and note the deficiency in the report.

SCHEDULE AND DELIVERABLES:

The NPEF is to collect all data by November 23rd. The deliverables are a test report and an executive-level briefing summarizing the findings. The executive-level briefing is due to NCO by November 30. The final deliverable report will be produced in both a publicly releasable version and "For Official Use Only" version. The report may include classified annexes as necessary. Proprietary data issues will be handled on a case-by-case basis.

FINANCIAL RESOURCES:

LightSquared's participation and financial/in-kind resource commitments will be clarified by the NCO working through NTIA. Any monetary compensation must be cleared by legal counsel. Specific independent NPEF tasks are intended for completion with no exchange of funds and are dependent upon funding, test asset, and test support personnel availability from each of the participating entities. All technical expertise, equipment, and test facilities in support of the NPEF task will be considered as contributions in kind. Estimated NPEF department and agency costs, available funding, and any shortfalls need to be assessed and reported to the NCO Director immediately.