

7 (a) The complete program of research and experimentation proposed including description of equipment and theory of operation.

The test earth station, a VSAT (very small aperture terminal), will be used with a gateway (a.k.a. hub) test bed, which is covered under separate license.

The two 1.0 meter antennas will be located on the same site as E030051, an 11.1 meter international transmit/receive Ku-band earth station. The analysis associated with that license shows that there will be no harmful radio frequency interference into any lawfully operated radio station. In the extremely unlikely event that harmful RF interference should occur into another lawfully operated radio station during the period of experimental operation, Intelsat LLC will cease operations immediately.

The gateway-VSAT system is a next generation system employing a TDM / MF-TDMA (time division multiplex / multi-frequency-time division multiple access) star topology. The gateway-to-VSAT ("downstream") link is TDM while the VSAT-to-gateway ("upstream") link is MF-TDMA. New features of this system include a DOCSIS-based (Data over Cable System Interface Specification) media access control (MAC) and real-time, automated, dynamic physical layer adaptation. The research and experimentation program is to validate the performance of the system in both its present status and when upcoming upgrades/releases are issued.

(b) The specific objectives sought to be accomplished.

Validation of performance parameters including:

- E_b/N_0
- dynamical physical layer (modulation, error coding, symbol rate) adaptation
- proper uplink power control with respect to changing physical layer configuration
- TDM efficiencies
- MF-TDMA scheduling efficiencies
- successful operation of modified DOCSIS MAC protocol in a satellite environment
- overall system response to expected end user traffic profiles
- overall system response in "real world" atmospheric conditions
- proper AFC (automatic frequency control) operation in a "real world" satellite environment.

(c) How the program of experimentation has a reasonable promise of contribution to the development, extension, expansion, or utilization of the radio art, or is along line not already investigated.

Proper performance of above stated objectives (in 10b) will result in much more efficient utilization of satellite bandwidth as measure in End user throughput (bits per second) versus satellite bandwidth (Hertz).

12. Include as an exhibit a narrative statement describing the type of applicant.

The applicant is a LLC.