FCC Form 312
Exhibit A
Description of Application

ViaSat, Inc. ("ViaSat") seeks blanket authority to operate up to 100,000 electrically identical terrestrial mobile earth terminals ("METs") to communicate with the SkyTerra-1 satellite, utilizing L-Band frequencies at 1525-1559 MHz and 1626.5-1660.5.[1] SkyTerra-1 is operated by LightSquared Subsidiary LLC ("LightSquared"), and is authorized to use these bands to serve the United States. As discussed below, these METs comply with all applicable Commission technical requirements.

A. The ViasSat VMT-2100-10 Mobile Earth Terminal

ViaSat is a leading provider of innovative satellite broadband services, and a leading manufacturer of innovative satellite communication products. The VMT-2100-10 represents yet another example of such innovation, delivering dependable, IP-based communication services to mobile platforms via satellite. The VMT-2100-10 has been designed to provide real-time situational awareness to machine-to-machine ("M2M") customers that otherwise would be dissatisfied with network responsiveness, using L-Band mobile-satellite service ("MSS") frequencies. The VMT-2100-10 relies on remarkably efficient bandwidth allocation, low-latency IP networking, and low required satellite power to enable real-time mobile communications more affordably than ever.

The VMT-2100-10 offers reliable network connectivity—even in harsh weather conditions—and brings dependable performance to locations where cellular infrastructure doesn't exist or is at risk of emergency network failure due to overload or power outage. The VMT-2100-10 is a variant of the rugged, high performance satellite transceivers that ViaSat designed and manufactured for the U.S. government as part of DoD Blue Force Tracking program. The VMT-2100-10 has been enhanced with integrated GPS capabilities to provide location data services.

When used for mobile tracking and communications, the system's two-way networking capability enables both real-time monitoring of position location information and data and voice communications. In fixed site applications, access to revenue-generating data is instant, and adjustment of field devices such as gas valves, smart grid sensors, water pumps, and reservoir level indicators can be performed remotely. ViaSat M2M technology enables reduction

[1] As noted in Exhibit C, ViaSat is excluding the 1544-1545 MHz and 1645.5-1646.5 MHz bands from its responses to Questions E43/44 and E52/53, respectively. These bands are reserved for safety and distress communications services, and ViaSat does not propose to operate in these frequency bands in this application.

of operating costs by monitoring and controlling gas, water, or power flow, optimizing purchase with demand-side management, and avoiding peak flow conditions to minimize costs. Other commercial applications include positive train control of locomotives, automatic vehicle location of public safety vehicles, remote access of sensor and monitoring devices, and tsunami and nuclear power plant warning systems.

The VMT-2100-10 operates over ViaSat's ArcLight networking platform, which provides two-way service over one or more interconnected hub ("gateway") installations through which multiple remote mobile terminals may access the Internet as they travel across the U.S. Customer networks would be managed through ViaSat's command, control, and situational awareness ("C2SA") Managed Service, which leverages communications technology that provides a highly reliable, low-latency, low-cost data network and challenges the cost models used to assess current M2M networks today. Each of the network components described above has been optimized for the packet-switched transport of position and telemetry data, while enabling use of IP applications such as chat, file transfer and voice.

B. Compliance with Out-of-Band and Spurious Emissions Lists

The level of out-of-band and spurious emissions from all METs that are the subject of this application will conform to the requirements of Sections 25.202(f) and 25.216 of the Commission's rules.[2]

C. Compliance with Section 25.136(d)

The METs covered by this application address the Commission's requirements for ensuring the priority and real-time preemption requirements necessary to protect the GMDSS in the following manner:[3]

1. *47 C.F.R. § 25.136(d)(1): All MES transmissions shall have a priority assigned to them that preserves the priority and pre-emptive access given to maritime distress and safety communications sharing the band.*

Transmissions to authorized METs are classified as having no priority relative to GMDSS communications. This classification is controlled by ViaSat's Network Operation Center ("NOC"), which is located in Carlsbad, California.

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2 *See* 47 C.F.R. §§ 25.202(f), 25.216.

3 *See* 47 C.F.R. §2.106 n.US315; 47 C.F.R. §25.136(d).

2. *47 C.F.R. § 25.136(d)(2): Each MES with a requirement to handle maritime distress and safety data communications shall be capable of either: (i) recognizing messages and call priority identification when transmitted from its associated Land Earth Station (LES); or (ii) accepting message and call priority identification embedded in the message or call when transmitted from its associated LES and passing the identification to shipboard data message processing equipment.*

This requirement does not apply to the proposed terrestrial mobile METs.

3. *47 C.F.R. § 25.136(d)(3): Each MES shall be assigned a unique terminal identification number that will be transmitted upon any attempt to gain access to a system.*

Each MET will be assigned a unique fixed terminal identifier (FTI). This unique identifier is programmed into the transceiver at the factory, and is required to gain access to the network. ViaSat's NOC will maintain an authorization database for all subscriber METs, and will grant or deny access accordingly.

4. *47 C.F.R. § 25.136(d)(4): After an MES has gained access to a system, the mobile terminal shall be under control of a LES and shall obtain all channel assignments from it.*

Any MET that has gained access to the ArcLight network will be subject to the control of ViaSat's NOC. Each MET will receive and act upon commands issued to it by the NOC. The NOC assigns all channel frequencies, including those to be used for signalling-only purposes.

5. *47 C.F.R. § 25.136(d)(5): All MESs that do not continuously monitor a separate signaling channel or signaling within the communications channel shall monitor the signaling channel at the end of each transmission.*

The VMT-2100-10 is a full-duplex MET and continuously monitors the signaling channel from the NOC.

6. *47 C.F.R. § 25.136(d)(6): Each MES shall automatically inhibit its transmissions if it is not correctly receiving separate signaling channel or signaling within the communications channel from its associated LES.*

MET transmissions will be inhibited unless the MET is correctly receiving either a signaling channel or the correct communications channel according to specified criteria. More

specifically, if the VMT-2100-10 cannot correctly receive the forward link from the NOC, the transceiver automatically terminates transmissions.

7. *47 C.F.R. § 25.136(d)(7): Each MES shall automatically inhibit its transmissions on any or all channels upon receiving a channel shut-off command on a signaling or communications channel it is receiving from its associated LES.*

In the event that a preemption is required, the NOC can shut down transmissions of all VMT-2100-10 terminals by disabling the forward link. As noted above, if the VMT-2100-10 cannot correctly receive the forward link from the NOC, the transceiver automatically terminates transmissions. In addition, the NOC can also inhibit transmission on any specific terminal or all terminals via an over the air command message.

8. *47 C.F.R. § 25.136(d)(8): Each MES with a requirement to handle maritime distress and safety communications shall have the capability within the station to automatically pre-empt lower precedence traffic.*

This requirement does not apply to the proposed terrestrial mobile METs.

D. Compliance with AMS(R)S Pre-emption Requirements

The METs covered by this application address the Commission's requirements for ensuring the priority and real-time pre-emption requirements necessary to protect AMS(R) Service[4] as discussed below:

1. *All MES transmissions shall have a priority assigned to them that preserves the priority and preemptive access given to distress and safety communications sharing the band.*

Transmissions to authorized METs are classified as having no priority relative to AMS(R)S communications. This classification is controlled by ViaSat's NOC. In addition, LightSquared, like all other MSS operators, protects AMS(R) Service transmissions in the band by a frequency planning and management process.

2. *Each MES with a requirement to handle distress and safety communications shall be capable of recognizing messages and call priority identification when transmitted from its associated LES.*

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[4] *See* 47 C.F.R. § 2.106 n.US308; *In re Application of AMSC Subsidiary Corporation,* 10 FCC Rcd 9507, 9511 (IB 1995).

This requirement does not apply to the proposed terrestrial mobile METs.

3. *Each MES shall be assigned a unique terminal identification number that will be transmitted upon any attempt to gain access to the system.*

Each MET will be assigned a unique fixed terminal identifier (FTI). This unique identifier is programmed into the transceiver at the factory and is required to gain access to the network. ViaSat's NOC will maintain an authorization database for all subscriber METs, and will grant or deny access accordingly.

4. *After an MES has gained access to a system, the mobile terminal shall be under control of a LES and shall obtain all channel assignments from it.*

Any MET that has gained access to the ArcLight network will be subject to the control of ViaSat's NOC. Each MET will receive and act upon commands issued to it by the NOC. The NOC assigns all channel frequencies, including those to be used for signalling-only purposes.

5. *All MESs that do not continuously monitor a separate signaling channel shall have provision for signaling within the communications channel.*

The VMT-2100-10 is a full-duplex MET and continuously monitors the signaling channel from the NOC.

6. *Each MES shall automatically inhibit its transmissions if it is not correctly receiving a separate signaling channel or signaling within the communications channel from its associated LES.*

MET transmissions will be inhibited unless the MET is correctly receiving either a signaling channel or the correct communications channel according to specified criteria. More specifically, if the VMT-2100-10 cannot correctly receive the forward link from the NOC, the transceiver automatically terminates transmissions.

7. *Each MES shall automatically inhibit its transmissions on any or all channels upon receiving a channel shut-off command on a signaling or communications channel it is receiving from its associated LES.*

In the event that a preemption is required, the NOC can shut down transmissions of all VMT-2100-10 terminals by disabling the forward link. As noted above, if the VMT-2100-10 cannot correctly receive the forward link from the NOC, the transceiver automatically terminates transmissions. In addition, the NOC can also inhibit transmission on any specific terminal or all terminals via an over the air command message.

8. *Each MES with a requirement to handle distress and safety communications shall have the capability within the station to automatically preempt lower precedence traffic.*

This requirement does not apply to the proposed terrestrial mobile METs.

E. Radiation Hazard Study

A radiation hazard analysis for the proposed MET type is attached hereto as Exhibit B. As demonstrated by the results of the analysis, the maximum permissible exposure limit (MPE) for protection of the General Population/Uncontrolled Exposures, 1 mW/cm^2 averaged over a thirty minute period, is met.[5]

F. Public Interest Showing

As noted above, the VMT-2100-10 relies on efficient bandwidth allocation, low-latency IP networking, and low required satellite power to enable real-time mobile communications more affordably than ever. This proven technology—which already has been integrated into critical U.S. Government applications—will bring significant benefits to commercial customers in the U.S. that currently are limited in their ability to run applications in real-time. In doing so, the VMT-2100-10 will facilitate more robust and efficient operations, including by critical infrastructure providers. More generally, the VMT-2100-10 will increase spectral efficiency in the L Band and reduce operating costs, allowing commercial customers to leverage M2M capabilities more fully. For these reasons, grant of this application is in the public interest.

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For the foregoing reasons, ViaSat respectfully requests that this application be granted.

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[5] The VMT-2100-10 is not a "portable device," in that it is not designed to be used within 20 centimeters of the operator's body. As such, the equipment authorization requirements set forth in Section 25.129 of the Commission's rules are inapplicable. *See* 47 C.F.R. § 25.129.