By Raul Magallanes

C-Band ESV Licenses Clear Way for Entry to Maritime Market

The U.S. Federal Communications Commission (FCC) has granted the first C-Band Earth Station on Vessels (ESV) licenses, and applicants are looking to enter the maritime markets with always-on telecommunications applications and are now seeking licenses that authorize them to use their stabilized antennas on C-band global beams.

ESV Defined

Earth Stations on Vessels are stabilized antennas used to provide satellite telecommunications on large marine craft. Stabilized antennas must lock onto the intended satellite for proper operation, but several conditions, including the vessel's unpredictable gyrations, can cause a stabilized antenna to drift from the intended satellite and cause harmful interference to adjacent satellites.

Historically, stabilized antennas were licensed under the FCC's regulations for fixed earth stations. However, the potential for harmful interference prompted the FCC to seek new rules for the licensing of ESVs, culminating with the release of a 2005 order outlining such regulations.

In 2006, the FCC granted the first Ku-band ESV licenses, but C-band applications remained under scrutiny. While Ku-band ESV license holders could exploit regional beams, it was the need to use global beams and frequencies immune to weather conditions that pushed some companies to pursue C-band licenses. Ultimately, the C-band ESV licenses give service providers broader access to the global maritime markets.

What are the ESV Regulations

There are three requirements that apply equally to C and Ku-band ESVs applicants:

- *Auto Shut-Off*: The system must shut off transmissions if the antenna deviates more than 0.5 degrees from the target satellite. The time to shut off must not exceed 100 milliseconds. The system must not initiate transmissions until the antenna is within 0.2 degrees from the intended satellite.
- *Power Density*: The stabilized antenna must meet certain off-axis power density radiation patterns as outlined by the FCC.
- *Vessel Tracking*: The system must be track vessel location at 20 minute intervals.

In addition, C-band ESV applicants also must meet the following requirements:

- *Frequency Coordination*: The applicant must follow FCC frequency coordination requirements to protect incumbent fixed microwave systems and other satellite earth stations. Frequency coordination requirements must be performed within 200 kilometers (125 miles) from the U.S. coastline.
- *Vessel Weight*: To restrict the operation of ESVs in narrow water paths and to protect incumbent microwave systems, antennas can only be installed on vessels heavier than 300 gross .
- *Space Segment*: Each ESV operator may coordinate up to 36 megahertz (MHz) of uplink capacity per satellite on up to two satellites. Collectively, all ESV operators in a given geographic area are limited to 180 MHz of coordinated bandwidth.

The biggest challenge that C-band ESV applicants have faced has been complying with the frequency coordination requirements. This is because frequency coordination must be performed along the entire path or paths that vessels travel.

FCC Jurisdiction Regarding ESVs

The FCC requires compliance with ESV regulations in the following situations: ESVs installed in U.S. registered vessels; ESVs installed in non-U.S. registered vessels communicating with U.S. hubs; and ESVs installed in non-U.S. registered vessels communicating with non-U.S. hubs, but operating within 300 kilometers of the U.S. coastline.

Satellite service providers should examine their existing FCC licenses to ensure compliance with ESV regulations. As service providers tackle the maritime market and use global beams, they should pursue, and work within the confines of appropriate FCC ESV authority.

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