Honeywell

HONEYWELL CONNECTED ENTERPRISE
400 Maple Grove Road
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www.honeywell.com

January 13, 2020

Federal Communications Commission
Authorization and Evaluation Division
7435 Oakland Mills Road
Columbia, MD 21046

ATTN: OET Department
FCC ID K6KIPLD

Dear Sir or Madam:

EMS Technologies Canada Ltd, a subsidiary company of Honeywell Connected Enterprise is submitting an explanation of the existing waivers to be used toward the new FCC ID K6KIPLD.

The new FCC ID K6KIPLD (Integrated PA, LNA and Diplexer Unit, IPLD), will only be used with the HDU 200 FCC ID K6KHSD-XI, (High Speed Data Unit). The IPLD is intended to form an integral part of a Inmarsat SwiftBroadband Aircraft Earth Station providing voice and data communication services to general aviation and military customers.

The IPLD performs the following primary functions:

1. Diplexing of the transmit and receive signals for a common RF connection to the Satcom antenna;
2. Broadband amplification of the transmit signal from the Satcom Satellite Data Unit (HDU 200);
3. Low-Noise amplification of the receive signal from the Satcom antenna; and
4. Monitoring and controlling functions to support overall Satcom system operation.

Since all transmit signal from the HDU 200 is amplified through the IPLD, it is understandable that all HDU 200 FCC ID K6KHSD-Xi waiver submitted to FCC and accepted by the FAA applies to FCC ID K6KIPLD.

Waiver requested HDU 200 47 Class II permissive change for K6K HSDXI, February 2nd 2011

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February 2nd, 2011

Federal Communications Commission
Authorization and Evaluation Division
7435 Oakland Mills Road
Columbia, MD 21046

ATTN: OET Department

PER: 47 FCC Class II Permissive change for FCC ID: K6KHSD-XI
(Original Grant Date: 04/21/2010)

Dear Sir or Madam:

EMS Technologies Canada Ltd. is submitting an application for Class II Permissive Change to the HSD-XI, 1252-A-4100-01, (FCC ID: K6KHSD-XI). The commission on 04/21/2010 originally certified this product under FCC ID: K6KHSD-XI.

There are no hardware or electrical modifications made to the applying transmitter portion.

The changes filed under this application are:

- A new transceiver variant of the HSD-XI has been created: HDU-200, 1541-A-3000.
- The HDU-200 uses a new external Low Noise Amplifier: IPLD, 1541-A-2000. The HSD-XI was originally certified with a different external Low Noise Amplifier.
- The HDU-200 uses a direct current power supply. The originally certified HSD-XI uses an alternating current power supply.
- The HDU-200 has four random access memory chips on the control card. The originally certified HSD-XI has two random access memory chips on the control card.

Please contact me if you have any questions or need further information regarding this application.

Sincerely,

Ron Halka
Director of Quality & Business Process Improvement
EMS Technologies Canada Ltd.

Waiver requested EMS Technologies HDR part 87 waiver Request, Nov14, 2013

EMS Technologies Canada, Ltd.,
400 Maple Grove Road
Ottawa, ONT, K2V 1B8
Telephone: (613) 591-9064

Nov 14, 2013

James Shaffer
Mobility Division
Wireless Telecommunications Bureau
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: EMS Technologies Canada, Ltd.
Request for Waiver of Section 87.131, 87.137, 87.139(i)(1) and 87.141(i) to permit a Class II permissive change to existing FCC certification grants.

Dear Mr. Shaffer:

On March 12, 2010, the Wireless Telecommunications Bureau ("Bureau") granted EMS Technologies Canada, Ltd. ("EMS") a waiver of Sections 87.131, 87.133, 87.137, 87.139(i)(1), 87.139(i)(3) and 87.141(j) of the Commission's rules to permit certification of its next generation aeronautical-mobile satellite service ("AMSS") transceivers HSD-128, HSD-400, HSD-440-, HSD-X and HSD-Xi.[1]

On April 29, 2010, the Wireless Telecommunications Bureau ("Bureau") granted EMS Technologies Canada, Ltd. ("EMS") a waiver of Sections 87.131, 87.133, 87.137, 87.139(i)(1), 87.139(i)(3) and 87.141(j) of the Commission's rules to permit certification of its next generation aeronautical-mobile satellite service ("AMSS") transceivers A781, HSD-MK2, A781-MK2, HSD-MK3, and A781-MK3.[2]

On July 5, 2010, the Wireless Telecommunications Bureau ("Bureau") granted EMS Technologies Canada, Ltd. ("EMS") a waiver of Section 87.139(i)(1) of the Commission's rules

[1] *See* EMS Technologies Request for Waiver filed on March 9, 2010 and granted by the Bureau on March 12, 2010, included as an Exhibit A ("EMS Waiver Grant").
[2] *See* EMS Technologies Request for Waiver filed on April 9, 2010 and granted by the Bureau on April 29, 2010, included as an Exhibit B ("EMS Waiver Grant").

to permit certification of its next generation aeronautical-mobile satellite service ("AMSS") transceiver HSD-MK2[3]

As discussed below, EMS Technologies Canada, Ltd, pursuant to section 1.925 of the Commission's rules, hereby requests one additional waiver of the Commission's rules. Specifically, EMS seeks a waiver to allow the introduction of High Data Rate, or HDR, services using new symbol rates and higher modulation schemes of 32QAM and 64QAM with the existing hardware platform. Specifically, EMS seeks a waiver of Sections 87.131, 87.137, 87.139(i)(1) and 87.141(i) of the Commission's rules to permit a Class II permissive change to all of the existing Transceivers listed above.

These transceivers provide high-speed Internet, voice and video conferencing capabilities in the cockpit, in the cabin and at the gate. The transceivers have been marketed in the United States under FCC certification ID's K6KHSD-128, K6KHSD-440, K6KHSD-X, K6KHSD-Xi K6KA781, K6KHSD-MK2, K6KA781-MK2, K6KHSD-MK3 and K6KA781-MK3 in support of the Inmarsat Classic, Swift64 and SwiftBroadband aircraft communications services. EMS's transceivers provide high-speed voice and data links to Inmarsat's world-wide satellite network in the 1525-1559 MHz receive and 1626.5-1660.5 MHz transmit bands.

The listed transceivers comply with Inmarsat technical requirements and specifications. A letter in support from Inmarsat can be provided at your request. In addition, the EMS transceiver meets the applicable ARINC Characteristics 429, 739, 600, 741 and 781; RTCA/DO-210 "The Satcom Minimum Operational Performance Standards;" and has been certified pursuant to a Federal Aviation Administration Type Certification, Supplemental Type Certification, and/or Technical Standard Order Certification as applicable to the end customer requirements. Therefore, grant of the waiver is in the public interest.

Requested Waiver – 87.139(i)(1)

As EMS explained in its previous waiver requests for the transceivers listed above, these transceivers meet the technical requirements of the Part 87 AMSS rules with respect to output power, spurious emissions, intermodulation and priority and preemption. Specifically, Swift64 and SwiftBroadband transmissions can be suspended if they would interfere with safety-related messages, or if ordered by the captain of the aircraft.[4] The Part 87 rules, however, only contemplate the modulation types and transmission characteristics used for the Inmarsat Aero-H, Aero-L and Aero-I services. Inmarsat's SwiftBroadband services offer higher data rates by utilizing more efficient modulation techniques. The Part 87 rules have not yet been updated to reflect these emissions types and bandwidth.

[3] *See* EMS Technologies Request for Waiver filed on June 2, 2010 and granted by the Bureau on July 5, 2010, included as an Exhibit C ("EMS Waiver Grant").
[4] *See* 47 C.F.R. §87.189(e).

EMS AVIATION

Nov 14, 2013

87.131 Authorized Emissions

Section 87.131 authorizes G1D, G1E and G1W for aircraft earth stations. The SwiftBroadband services, however, will use 32-QAM and 64-QAM (or Quadrature Amplitude Modulation) schemes, with emission type D7W in addition to QPSK and 16-QAM, which were covered under the previously submitted waiver. Therefore, EMS requests waiver of the authorized emissions in Section 87.131 of the Commission's rules.

87.137 Types of Emissions

Section 87.137(a) of the Commission's rules authorizes for aircraft earth stations emissions designator 21K0G1D and the authorized bandwidth for aircraft earth station emissions above 50 MHz is 25 kHz. Lower values of necessary and authorized bandwidths are also permitted. As explained above, however, SwiftBroadband service will utilize 32-QAM and 64-QAM modulation schemes, with emissions class D7W. Due to the increased symbol rates for QPSK, 16-QAM, 32-QAM and 64-QAM a larger authorized bandwidth is necessary. An adequate bandwidth for SwiftBroadband is 225 kHz.

Therefore, EMS seeks waiver of Section 87.137(a) of the Commission's rules to authorize the following emissions designators for the EMS transceivers:

Emissions Designator	Authorized Bandwidth (kHz) (Above 50 MHz)
110KG7W	225
110KD7W	225
220KG7W	225
220KD7W	225

87.139(i)(1), note 2 Emission Limitations

Section 87.139(i)(1) of the Commission's rules provides the required attenuation for a modulated carrier and note 2 provides an absolute offset of +/- 35 kHz. Under the required designs for the new modulation techniques, in many cases, ninety-nine percent of the occupied bandwidth exceeds the +/- 35 kHz offset. In other words, the new modulation schemes used for SwiftBroadband make meeting the offset impossible. In accordance with the Inmarsat

requirements, EMS requests a waiver of Section 87.139(i), note 2 to permit an absolute offset of +/- 560 kHz. The +/-560 kHz is derived from the relationship of the symbol rates. HDR has a maximum symbol rate of 168 ksps compared to 10.5 ksps for the services defined in part 87.

$$\frac{168 \text{ ksps}}{10.5 \text{ ksps}} \times (+/-35 \text{ kHz}) = +/- 560 \text{ kHz}$$

+/- 35 kHz was based on a carrier with a symbol rate of 10.5 ksps. Hence, for the new bearer with a symbol rate of 168 ksps, the exclusion zone works out to be +/- 560 kHz from the carrier centre.

87.141(j) Modulation Requirements

Section 87.141(j) of the Commission's rules requires transmitters used as aircraft earth stations to employ BPSK for transmission rates up to and including 2400 bps, and QPSK for higher rates. Due to the requirements of the SwiftBroadband service, the EMS transceivers use additional modulation schemes that do not meet this requirement. Specifically, the SwiftBroadband services require the use of 32-QAM and 64-QAM at transmission rates higher than 2400 bps in addition to QPSK and 16-QAM, which were covered under a previously submitted waiver. EMS therefore requests waiver of Section 87.141(j) of the Commission's rules to permit the use of 32-QAM and 64-QAM modulations.

Conclusion

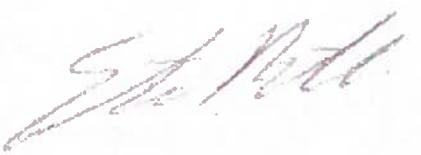
EMS requests that the Commission waive the requirements of Part 87 described above to permit a Class II permissive change to all existing Inmarsat AMSS transceivers granted under FCC certification ID's K6KHSD-128, K6KHSD-440, K6KHSD-X, K6KHSD-Xi K6KA781, K6KHSD-MK2, K6KA781-MK2, K6KHSD-MK3 and K6KA781-MK3. The Commission has granted similar waivers to EMS, Rockwell Collins, Honeywell and others so that aircraft passengers and crew can receive high speed voice and data communications. Such waiver will not cause harmful interference to other services and is in the public interest.

EMS AVIATION

Nov 14, 2013

Please feel free to contact the undersigned with any questions.

Respectfully submitted,



Steve Mills

Waivers Granted by FAA Dec 4 2013.

U.S. Department
of Transportation
Federal Aviation Administration

DEC 4 2013

Mr. Andy Leimer
Federal Communications Commission
Equipment Authorization Branch
7435 Oakland Mills Road
Columbia, Maryland 21046

Dear Mr. Leimer:

The Federal Aviation Administration (FAA), Spectrum Engineering Services Group, has reviewed the filing by EMS Aviation for a Class II Permissive Change for the HSD-128, HSD-440, HSD-X, HSD-Xi, HSD-MK2, HSD-MK3, A781, A781-MK2 and A781-MK3 Aeronautical Earth Station Satellite Communications Transceiver models to allow the introduction of high data rate services using new symbol rates and higher modulation schemes of 32QAM and 64 QAM with the existing hardware platform. The FAA has no objections, this proposal noting that EMS has agreed that though the new emission types are not yet defined in RTCA Inc. DO-210 Minimum Operational Performance Standards, EMS will test the terminals, when operating with the new emission types, to validate conformance with:

> RTCA/DO-210D, Minimum Operational Performance Standards for Geosynchronous Orbital Aeronautical Mobile Satellite Services (AMSS) Avionics, Change Number 3, Issues Sep 19, 2006, Section 2.2.4.2.5.2 – Harmonics, Discrete Spurious and Noise Density for Equipment without Intermodulation Frequency Control. The in-band unwanted emission measurement exclusion will be changed from +/-35 kHz to +/-560 kHz to accommodate the higher symbol rate of the new emission types.

Should you have any questions or concerns, please contact Mr. Michael Biggs, Senior Electronics Engineer, Spectrum Planning and International Group, at (202) 267-8241 or via email michael.biggs@faa.gov.

Sincerely,

Ian Atkins
Director, Spectrum Engineering Services

Sincerely

Dennis Teske
Sr Director, Engineering, Satcom