Approved by OMB 3060-0678
Estimated Burden: up to 80 hours
April 2016

Federal Communications Commission

312 File Number: **SATRPL2018043000033**

Filing Description

Question	Response
Description	SXM-7 SDARS Replacement Geostationary Satellite located at 85.15 degrees W.L.

Satellite Information

Question	Response
Select Orbit Type	GSO
Space Station or Satellite Network Name	SXM-7
Estimated Lifetime of Satellite(s) From Date of Launch	15 Years
Will the space station(s) operate on a Common Carrier basis?	No

Operating Frequency Bands (4)

Nature of service	Description	Frequency Band (s)	Mode Type
Satellite Digital Audio Radio Service		2320.0 MHz -2345.0 MHz	Transmit
Fixed-Satellite Service		7025.0 MHz -7075.0 MHz	Receive
Fixed-Satellite Service		4196.0 MHz -4198.5 MHz	Transmit
Fixed-Satellite Service		6422.0 MHz -6425.0 MHz	Receive

Orbital Information For Geostationary Satellites

Section	Question	Response
Orbital Longitude Information	Orbital Longitude	85.0 degrees
	Hemisphere of Orbital Longitude	W
Longitudinal Tolerance or East /West Station-Keeping	Toward West	0.1 degrees
	Toward East	0.1 degrees
Inclination Excursion or North /South Station-Keeping Tolerance	Inclination Excursion or North /South Station-Keeping Tolerance	0.1 degrees
Antenna Axis Attitude Accuracy	Roll	0.11 degrees
	Pitch	0.11 degrees
	Yaw	0.11 degrees

Receiving Beams 1:

Question	Response
Beam ID	XU1
Receive Beam Frequency	7025.0 MHz -7075.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	29.65 dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.0 degrees
Polarization Switchable	No
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	0.85 dB/K
Min. Saturation Flux Density	-108.0 dBW/m2
Max. Saturation Flux Density	-88.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Feeder Uplink Beam Gain Contour

Receiving Beams 2:

Question	Response
Beam ID	OMC1
Receive Beam Frequency	6422.0 MHz -6425.0 MHz
Beam Type	Fixed
Polarization	LHCP
Peak Gain	3.0 dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.0 degrees

Polarization Switchable	No
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-36.1 dB/K
Min. Saturation Flux Density	-81.0 dBW/m2
Max. Saturation Flux Density	-50.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Omni Antenna Coverage

Receiving Beams 3:

Question	Response
Beam ID	OSC1
Receive Beam Frequency	7025.0 MHz -7075.0 MHz
Beam Type	Fixed
Polarization	LHCP
Peak Gain	22.0 dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.0 degrees
Polarization Switchable	No
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-21.2 dB/K
Min. Saturation Flux Density	-100.0 dBW/m2
Max. Saturation Flux Density	-50.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Global Antenna Coverage

Receiving

Beams 4:

Question	Response
Beam ID	OMX1
Receive Beam Frequency	7025.0 MHz -7075.0 MHz
Beam Type	Fixed
Polarization	LHCP
Peak Gain	3.0 dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.0 degrees
Polarization Switchable	No
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
G/T at Max. Gain Point	-36.3 dB/K
Min. Saturation Flux Density	-81.0 dBW/m2
Max. Saturation Flux Density	-50.0 dBW/m2
Co- or Cross Polar Mode	C
Service Area Description	Omni Antenna Coverage

Receiving Channels (11)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
CMC2	1.0	6424.5	TT&C
CMC1	1.0	6422.5	TT&C
CMX1	1.0	7041.0	TT&C
CMX2	1.0	7073.0	TT&C
U001	1.84	7061.561	Feeder Link
U002	1.84	7063.993	Feeder Link
U003	1.84	7065.965	Feeder Link
U004	1.84	7068.397	Feeder Link
U005	4.5	7062.293	Feeder Link
U006	4.5	7070.207	Feeder Link
U007	12.5	7066.25	Feeder Link

Transmitting Beams 1:

Question	Response
Beam ID	SD1
Transmit Beam Frequency	2320.0 MHz -2345.0 MHz
Beam Type	Fixed
Polarization	LHCP
Peak Gain	34.93 dBi
Antenna Pointing Error	0.11 degrees
Antenna Rotational Error	0.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-7.5 dBW/Hz
Max. Transmit EIRP	73.3 dBW
Co- or Cross Polar Mode	C
Service Area Description	SDARS Downlink Beam Gain Contours

Max. Power Flux Density

* BW:	* 0° - 5° (dbW/m^2 /BW):	* 5° - 10° (dbW/m^2 /BW):	* 10° - 15° (dbW/m^2 /BW):	* 15° - 20° (dbW/m^2 /BW):	* 20° - 25° (dbW/m^2 /BW):	* 25° - 90° (dbW/m^2 /BW):
4.0 kHz	-131.1	-129.8	-127.1	-122.7	-120.0	-120.0

Transmitting Beams 2:

Question	Response
Beam ID	OST1
Transmit Beam Frequency	2320.0 MHz -2345.0 MHz

Beam Type	Fixed
Polarization	RHCP
Peak Gain	33.15 dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-18.5 dBW/Hz
Max. Transmit EIRP	38.6 dBW
Co- or Cross Polar Mode	C
Service Area Description	On-Station Telemetry Beam Gain Contours

Max. Power Flux Density

* BW:	* 0° - 5° (dbW/m^2 /BW):	* 5° - 10° (dbW/m^2 /BW):	* 10° - 15° (dbW/m^2 /BW):	* 15° - 20° (dbW/m^2 /BW):	* 20° - 25° (dbW/m^2 /BW):	* 25° - 90° (dbW/m^2 /BW):
4.0 kHz	-147.6	-153.6	-148.0	-147.5	-148.8	-150.5

Transmitting Beams 3:

Question	Response
Beam ID	OMS1
Transmit Beam Frequency	2320.0 MHz -2345.0 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	3.0 dBi
Antenna Pointing Error	0.12 degrees

Antenna Rotational Error	0.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-45.5 dBW/Hz
Max. Transmit EIRP	11.6 dBW
Co- or Cross Polar Mode	C
Service Area Description	Omni Antenna Coverage

Max. Power Flux Density

* BW:	* 0° - 5° (dbW/m^2 /BW):	* 5° - 10° (dbW/m^2 /BW):	* 10° - 15° (dbW/m^2 /BW):	* 15° - 20° (dbW/m^2 /BW):	* 20° - 25° (dbW/m^2 /BW):	* 25° - 90° (dbW/m^2 /BW):
4.0 kHz	-171.9	-171.9	-171.9	-171.9	-171.9	-171.9

Transmitting Beams 4:

Question	Response
Beam ID	OMC2
Transmit Beam Frequency	4196.0 MHz -4198.5 MHz
Beam Type	Fixed
Polarization	RHCP
Peak Gain	3.0 dBi
Antenna Pointing Error	0.12 degrees
Antenna Rotational Error	0.0 degrees
Polarization Switchable	No
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-43.5 dBW/Hz

Max. Transmit EIRP	13.6 dBW
Co- or Cross Polar Mode	C
Service Area Description	Omni Antenna Coverage

Max. Power Flux Density

* BW:	* 0° - 5° (dbW/m^2 /BW):	* 5° - 10° (dbW/m^2 /BW):	* 10° - 15° (dbW/m^2 /BW):	* 15° - 20° (dbW/m^2 /BW):	* 20° - 25° (dbW/m^2 /BW):	* 25° - 90° (dbW/m^2 /BW):
4.0 kHz	-169.8	-169.8	-169.8	-169.8	-169.8	-169.8

Transmitting Beams 5:

Question	Response
Beam ID	TB1
Transmit Beam Frequency	2320.0 MHz -2345.0 MHz
Beam Type	Fixed
Polarization	LHCP
Peak Gain	34.77 dBi
Antenna Pointing Error	0.11 degrees
Antenna Rotational Error	0.0 degrees
Polarization Switchable	
Polarization Alignment Relative to the Equatorial Plane	45.0 degrees
Max. Transmit EIRP Density	-4.8 dBW/Hz
Max. Transmit EIRP	57.8 dBW
Co- or Cross Polar Mode	C
Service Area Description	Test Beam Transmit Gain Contours

Max. Power Flux Density

* BW:	* 0° - 5° (dbW/m^2 /BW):	* 5° - 10° (dbW/m^2 /BW):	* 10° - 15° (dbW/m^2 /BW):	* 15° - 20° (dbW/m^2 /BW):	* 20° - 25° (dbW/m^2 /BW):	* 25° - 90° (dbW/m^2 /BW):
4.0 kHz	-142.2	-140.6	-138.5	-137.6	-136.5	-135.3

Transmitting Channels (13)

Channel ID	Channel Bandwidth (MHz)	Center Frequency s (MHz)	Feeder Link, Service Link or TT&C
D004	1.84	2344.045	Service Link
D003	1.84	2342.205	Service Link
D002	1.84	2335.305	Service Link
D001	1.84	2333.465	Service Link
TMC2	0.512	4198.0	TT&C
D005	4.5	2322.293	Service Link
D006	4.5	2330.207	Service Link
D007	12.5	2326.25	Service Link
TMC1	0.512	4196.5	TT&C
TMS1	0.512	2323.1	TT&C
TMS2	0.512	2325.5	TT&C
TMS3	0.512	2335.0	TT&C
TMS4	0.512	2339.6	TT&C

Certification Questions

Question	Response
Are the applicable service area coverage requirements of 25.143(b)(2)(ii) and (iii), or 25.144(a)(3)(i), or 25.145(c)(1) and (2), or 25.146(i)(1) and (2), or 25.148(c), or 25.225 met?	Yes
Are the applicable frequency tolerances of 25.202(e) and out-of-band emission limits of 25.202(f)(1),(2), and (3) met?	Yes
Are the cessation of emissions requirements of 25.207 met?	Yes
Are the applicable power-flux-density limits of 25.208 met, and is the appropriate technical showing provided within the application?	Yes
For NGSO applications, are the applicable equivalent-power-flux-density limits of 25.208 met, and is the appropriate technical showing provided within the application?	N/A
Are the applicable full-frequency-reuse requirements of 25.210 met?	Yes
If the application is for a 17/24 GHz BSS space station, will it be operated at an offset location with full power and interference protection in accordance with 25.262(b)?	

Attachments

File Name	Beam	Field	Attachment Type	Description
fcc_sxm78_wgsa85_copol.gxt	XU1	GSO Antenna Gain Contour Data	GXT file (*.gxt)	
fcc_sxm78_eastdl85_copol.gxt	SD1	GSO Antenna Gain Contour Data	GXT file (*.gxt)	
fcc_sxm78_eastost85_copol.gxt	OST1	GSO Antenna Gain Contour Data	GXT file (*.gxt)	