

ATTACHMENT

Description of Application for Modification of License

1.0 OVERVIEW

Row 44, Inc. (“Row 44”) seeks modification of its Ku-band Earth Stations Aboard Aircraft (“ESAA”) license (Call Sign E080100) for the purpose of adding an additional satellite point of communication – the Eutelsat 133 WA satellite (“E133 WA”) located at 132.85° West Longitude. Row 44 seeks this modification subject to all terms and conditions set forth in its current license¹ and the operations proposed are otherwise consistent with the technical specifications set forth in its current license. Operations using the additional satellites would use both the TECOM Ku-Stream (SAA/Remote 2) and QEST Q050000 (GSAA/Remote 3) antennas. The Form 312, Schedule B associated with this filing reflects only the additional points of communication and additional receive frequencies for E133 WA and does not recapitulate all of the technical data contained in its current license.

2.0 ADDITIONAL POINT OF COMMUNICATION REQUESTED

Row 44 requests the addition of the E133 WA satellite that recently initiated modified service at the 132.85° W.L. orbital location through the repointing of its Ku-band Fixed Beam to provide coverage of Hawaii as well as the Western Continental United States. The E133 WA satellite, which operates under an International Telecommunication Union registration of the administration of France, is permitted to serve U.S. locations under Call Sign S3031 (FCC File Nos. SAT-PPL-20180302-00018 and SAT-MPL-20180908-00068).

Complete technical information regarding the E133 WA satellite was submitted to the FCC in the proceeding authorizing the satellite’s inclusion on the Ku-band Permitted List, which is cited in the foregoing paragraph. Row 44 therefore simply requests that its existing ESAA license be updated to reflect use of E133 WA on a primary basis for ESAA operations in the 14-14.5 GHz and 11.7-12.2 GHz bands [and it seeks authority as further detailed below to communicate with on an unprotected basis in the 10.95-11.7 GHz downlink band, consistent with Commission precedent and the terms of the authorization].

The addition to the Row 44 license of authority to communicate using E133 WA will provide additional near-term space segment capacity for Row 44’s ESAA network, thereby allowing it to provide additional throughput and coverage for the provision of its in-flight Wi-Fi connectivity services to airline passengers on flights operating in the Western United States and between CONUS and Hawaii. Row 44 is concurrently seeking special temporary authority (“STA”) to permit it to operate using these same parameters on an expedited basis to begin service on or about March 17, 2019,

¹ See Row 44 Inc., Call Sign E080100, FCC File No. SES-MFS-20180515-00624 (Sat. Div., granted 7/17/2018).

3.0 COORDINATION CERTIFICATION [47 C.F.R. §§ 25.227(b)(2) & 25.220(d)]

Row 44's intended operations are within the scope that Eutelsat has coordinated with the adjacent satellite operators within six degrees adjacent to E133 WA in either direction along the geostationary arc and should not cause harmful interference to any of these satellites operating in accordance with FCC's two-degree spacing policy. Exhibit A attached hereto provides copies of the March 12, 2019 coordination certification letter covering Row 44's proposed operations using E133 WA.

In the event that a Ku-band NGSO FSS system is launched in the future, Row 44 would enter into coordination with the NGSO FSS system operator to establish operating parameters that permit successful co-frequency sharing, and would modify its operations as necessary to effect any coordination agreement reached. Row 44 acknowledges that the Commission may condition the grant of any modified license issued to it upon a requirement that it complete such coordination at the appropriate time.

4.0 TECHNICAL DATA, LINK BUDGETS AND PREDICTED COVERAGE AREAS [47 C.F.R. § 25.227(b)(4)]

Exhibit B attached hereto includes representative link budgets and a depiction of the geographic coverage contours for operations using E133 WA at 132.85° W.L.

5.0 REQUESTS FOR WAIVER OF FCC RULES

Row 44 seeks waiver of the Commission's Table of Allocations, including footnote NG52, to permit operations with the E133 WA satellite in the extended Ku-band segments at 11.2-11.45 GHz and 12.5-12.75 GHz on an unprotected, non-interference basis, including limited operation of terminals in U.S. airspace in the 11.2-11.45 GHz band. Grant of the requested waivers is fully consistent with applicable Commission precedent, under which the Commission has observed that "terminals on U.S.-registered aircraft may need to access foreign satellites while traveling outside of the United States (e.g., over international waters), and therefore may need to downlink in the extended Ku-band in certain circumstances."² The Commission has previously authorized ESAA operators to use other extended Ku-band frequencies for downlinks through the modification of the Table of Allocations to permit ESAA operations not only in the conventional Ku-band, but in the discrete 10.95-11.2 GHz and 11.45-11.7 GHz segments of the extended Ku-band as well.³ The Commission then

² See *Service Rules and Procedures to Govern the Use of Aeronautical Mobile Satellite Service Earth Stations in Frequency Bands Allocated to the Fixed Satellite Service*, IB Docket No. 05-20, Notice of Proposed Rulemaking, 20 FCC Rcd 2906, 2917 (¶ 18) (2005).

³ See 47 C.F.R. § 2.106, note NG52, adopted in *Revisions to Parts 2 and 25 of the Commission's Rules to Govern the Use of Earth Stations Aboard Aircraft Communicating with Fixed-Satellite Service Geostationary-Orbit Space Stations Operating in the 10.95-11.2 GHz, 11.45-11.7 GHz, 11.7-12.2 GHz and 14.0-14.5 GHz Frequency Bands*, FCC 12-161, Report & Order, 27 FCC Rcd 16510, 16520-21 (¶ 21) (2012) ("ESAA R&O").

acknowledged that ESAA operators may also require access to other extended Ku-band downlink spectrum, and that access to such spectrum could be granted “on a case-by-case basis under Part 25 licensing rules.”⁴ In the *ESAA R&O*, the Commission made clear that ESAA operations in the 10.95-11.2 GHz and 11.45-11.7 GHz band were permitted on an unprotected basis and no waiver of footnote NG52 is required for such operations, but this existing exception does not extend to the 11.2-11.45 GHz and 12.5-12.75 GHz portions of the extended Ku-band. The Commission has nonetheless authorized ESAA operations in these bands on multiple occasions.⁵

Consistent with these past rulings, Row 44 requests a waiver of the Table of Allocations and footnote NG52 to the extent necessary to permit its terminals to receive transmissions from E133 WA in the 11.2-11.45 GHz and 12.5-12.75 GHz bands, including use of the 11.2-11.45 GHz band to provide limited U.S. domestic in-flight services. Although authority for limited domestic operations is requested, as the capacity to be utilized on E133 WA is primarily for flights to Hawaii and other Pacific Ocean destinations, the bulk of the transmissions to aircraft in this band will be over international waters. The Commission has already specifically granted Eutelsat U.S. market access for the E133 WA satellite.⁶ Accordingly, authorizing Row 44 to receive signals from this satellite in the 11.2-11.45 GHz and 12.5-12.75 GHz bands (within ITU Region 2, outside the U.S.) on a limited basis consistent with this grant will not alter any existing space segment operations, and therefore will not create any new risk of harmful interference to other authorized users of the spectrum. Furthermore, Row 44 will not claim interference protection from such authorized users. Under these circumstances, waiving Section 2.106 and footnote NG52 to the extent requested is appropriate.

6.0 REVISED SPACECRAFT, FREQUENCY & BEAM COVERAGE

[See Next Page]

⁴ See *ESAA R&O*, 27 FCC Rcd at 16520 n.43.

⁵ See, e.g., Modification Application of AC BidCo LLC, FCC File No. SES-MFS-20171220-01351(Call Sign E120106) (granted March 9, 2018)(11.2-11.45 GHz band; see conditions 90458 and 900389); Modification Application of Panasonic Avionics Corporation, File No. SES-MFS-20180122-00052 (Call Sign E100089) (granted Aug. 1, 2018) (both the 11.2-11.45 GHz and 12.5-12.75 GHz bands; see conditions 90407 and 90458); see also Current Row 44, Inc. Authorization, FCC File No. SES-MFS-20180515-00624 (granted July 17, 2018)(Conditions 90426 and 90458).

⁶ Eutelsat 133 WA Market Access Grant, SAT-MPL-20180908-00068 (Call sign S3031) (granted Feb. 14, 2019).

Table 1: Spacecraft, Frequency & Beam Coverage Table
 (All Provide Some Coverage to U.S. Locations; * =Non-U.S., Permitted List Satellite)

Satellite	Location	Beam Coverage Area	Tx (GHz)	Rx (GHz)	Satellite Operator
AMC-1	130.9 W	North America, Central America and Pacific	14.05-14.47	11.7-12.2	SES
AMC-2	84.85 W	North America, Caribbean and North Atlantic	14.05-14.47	11.7-12.2	
AMC-3	72.0 W	North America, Central America, Atlantic and Caribbean	14.05-14.47	11.7-12.2	
AMC-9	83.0 W	North America, Caribbean, Central America and North Atlantic	14.05-14.47	11.7-12.2	
SES-1	101.0 W	North America, Central America, Pacific and Caribbean	14.05-14.47	11.7-12.2	
SES-10	67.0W	North America, Central America, South Atlantic and Caribbean	14.05-14.47	11.7-12.2	
SES-15	129.0 W	North America, Central America, Caribbean and Pacific	14.05-14.47	10.7-10.95, 10.95-11.2, 11.2-11.45, 11.45-11.7, 11.7-12.2	
IS-29E	50.0 W	North America, Central America, South America, North Atlantic and Caribbean	14.05-14.47	10.95-11.2, 11.2-11.45, 11.45-11.7, 11.7-12.2, 12.2-12.5	Intelsat
Eutelsat 115 WB*	114.9 W	North America, North Atlantic and Pacific Ocean	14.05-14.47	11.7-12.2	Eutelsat
Eutelsat 133 WA*	132.85 W	North America and Pacific	14.05-14.47	11.2-11.45, 11.45-11.7, 12.5-12.75	
Telstar 12	109.2 W	North America, Gulf of Mexico and Caribbean	14.05-14.47	11.7-12.2	Telesat (Skynet)

7.0 TELEPORT UPLINK LOCATIONS

Table 2
Teleport Locations for Provision of Service within the United States

Satellite	Orbital Location	Teleport Location(s)	Site Operator	Call Sign(s)
AMC-1	130.9 W	Holmdel, NJ	GEE/MTN	E160163
AMC-2	80.85W	N. Las Vegas, NV	Hughes	E940460
AMC-3	72.0 W	Holmdel, NJ	GEE/MTN	E160163
AMC-9	83.0W	North Las Vegas, NV	Hughes	E940460
SES-1	101.0W	North Las Vegas, NV	Hughes	E940460
SES-10	67.0W	Steele Valley, CA	Level 3/ Vyvx	E950202
SES-15	129.0 W	South Mountain, CA	SES	E170139
IS-29E	50.0 W	Holmdel, NJ	GEE/MTN	E160163
Eutelsat 115 WB*	114.9W	Southfield (Detroit), MI	Hughes	E990170
Eutelsat 133 WA*	132.85 W	Kapolei, HI	Hawaii Pacific Teleport	E010236
Telstar 12	109.2W	South Jordan, UT	LBiSat LLC	E030342

* = Non-U.S.-licensed satellite included on Ku-band Permitted List

7.0 LICENSEE CERTIFICATION

I, Simon McLellan, Chief Engineer of Row 44, Inc. ("Row 44") and Global Eagle Entertainment, Inc. ("Global Eagle"), hereby certify that Row 44/Global Eagle:

- (1) will continue to comply with the requirements of paragraphs (a)(6), (a)(9), (a)(10), and (a)(11) of Section 25.227 of the Commission's Rules and the conditions of its existing license; and
- (2) has confirmed, as shown by the Eutelsat coordination letter submitted with this application, that the ESAA operations proposed herein are within coordinated parameters for adjacent satellites up to 6 degrees away on the geostationary arc.



Simon McLellan
Chief Engineer
Row 44, Inc., a subsidiary of
Global Eagle Entertainment, Inc.

March 12, 2019

EXHIBIT A

Eutelsat Coordination Certification Letter
for E133 WA at 132.85° W.L., dated March 12, 2019

March 12, 2019

Federal Communications Commission
International Bureau
445 12th Street, S.W.
Washington, D.C. 20554

Re: Engineering Certification for Eutelsat 133 WA at 132.85° West Longitude

To Whom It May Concern:

Satélites Mexicanos S.A. de C.V. dba Eutelsat Americas confirms that Global Eagle Entertainment, Inc. (“GEE”) is seeking to modify its existing Federal Communications Commission (“FCC”) blanket authorization (Call Sign E080100) for operation of Ku-band Earth Stations Aboard Aircraft (“ESAA”) as an application of the fixed-satellite service (“FSS”) and consistent with ITU RR 5.504A with the above-referenced Eutelsat satellite Eutelsat 133WA:

- a) The proposed operation of the ESAA transmit/receive terminals at the power density levels defined between GEE and Eutelsat is consistent with existing satellite coordination agreements with operators of all satellites within six degrees of orbital separation from Eutelsat 133 WA.
- b) If the FCC authorizes the operation proposed by GEE, Eutelsat will include the power density levels as prescribed and within the satellite coordination agreements, in all future satellite network coordination with adjacent satellite operators for Eutelsat 133 WA.

Sincerely,



Erik W. Hansen
VP, North America
Eutelsat Americas

Accepted by GEE:

Simon McLellan

Simon McLellan
Chief Engineer
Global Eagle Entertainment, Inc.

EXHIBIT B

Link Budgets and Predicted Coverage Areas

Date
28 February 2019

	<i>Forward 45cm</i>	<i>Return 45cm 1M</i>	<i>Return 45cm 1M</i>
SPACE SEGMENT			
Satellite	E133WA	E133WA	E133WA
Orbital Position	-132.85	-132.85	-132.85
Transponder	F2	F2	F2
Bandwidth (MHz)	72	72	72
Uplink frequency (MHz)	14041.6700	14041.6700	14041.6700
Downlink frequency (MHz)	12541.6700	12541.6700	12541.6700
Uplink Coverage	Steerable 2 Receive	Steerable 2 Receive	Steerable 2 Receive
Downlink Coverage	Steerable 2 Transmit	Steerable 2 Transmit	Steerable 2 Transmit
Uplink Polarization	X	X	X
Downlink Polarization	Y	Y	Y
IPFD setting (dBW/m ²)	-85	-85	-85
IBO Multicarrier (dB)	8.4	8.4	8.4
OBO Multicarrier (dB)	3.7	3.7	3.7
CARRIER PARAMETERS			
Service category	DATA	DATA	DATA
Topology	OUTBOUND	INBOUND	INBOUND
Modem Manufacturer	Other	HNS	HNS
Modem reference		HN/HX	HN/HX
Technology	DVB-S2	OTHER	OTHER
Pilots	OFF	N/A	N/A
Frame	Normal	N/A	N/A
Modulation	4 PSK	4 PSK	4 PSK
FEC	1/2	1/2	1/2
Spreading Factor	1	1	1
Roll Off (%)	20	25	25
Spectral efficiency (bps)	0.99	1	1
Reed Solomon (n/k)	1	204/188	204/188
Symbol rate (Mbaud)	13	1.064	1.064
Usefull Bit rate (Mbps)	12.855	1.064	1.064
Overall Bit rate (Mbps)	12.855	1.064	1.064
E _b /N ₀ (dB)	1.7	4	4
E _s /N ₀ (dB)	1.65	4	4
BER		0.	0.
CARRIER RESOURCES			
Transponder mode	Linear	Linear	Linear
IBO carrier (dB)	14.05	32.55	32.55
OBO carrier (dB)	9.35	27.85	27.85
Bandwidth consumption (MHz)	15.6	1.33	1.33
Power consumption (MHz)	19.6	0.277	0.277
IPFD carrier (dBW/m ²)	-103.05	-120.55	-120.55
GROUND SEGMENT - UPLINK			
Earth Station Code			
Country	United States of America - US		
Location	Kapolei	REMOTE	REMOTE
Longitude (°)	-158.09	-158.09	-158.09
Latitude (°)	21.34	21.34	21.34
Distance (km)	36955.62	36955.62	36955.62
satellite G/T towards transmit station (dB/K)	4	3	3
Elevation angle (°)	52.08	52.08	52.08
Azimuth angle (°)	127.66	127.66	127.66
Antenna size (m)	8	0.45	0.45
Atmospheric losses (dB)	0.2	0.2	0.2
Uplink EIRP (dBW)	59.49	42.	42.
Post PA losses (dB)	4	0.5	0.5
Operating HPA Power (clear sky) (W)	1.25	6.24	6.24
HPA Rating (W)	24.86	6.24	6.24
GROUND SEGMENT - DOWNLINK			
Earth Station			
Country		United States of America - US	United States of America - US
Location	REMOTE	Kapolei	Kapolei
Longitude (°)	-158.09	-158.09	-158.09
Latitude (°)	21.34	21.34	21.34
Distance (km)	36955.62	36955.62	36955.62
Antenna G/T towards satellite (dB/K)	11.88	36.48	36.48
Elevation angle (°)	52.08	52.08	52.08
Azimuth angle (°)	127.66	127.66	127.66
Antenna size (m)	0.45	8	8
Atmospheric Losses (dB)	0.3	0.3	0.3
Satellite EIRP towards receive station (dBW)	49.5	43	43
System temperature (K)	117	161.43	161.43

RESULTS

Uplink Path Length (km)	36955.62	36955.62	36955.62
Thermal Uplink C/N (dB)	14.01	6.38	6.38
Aggregated C/I Uplink (dB)	25	16.	16.
Uplink Propagation Losses (dB)	206.74	206.74	206.74
Downlink Path Length (km)	36955.62	36955.62	36955.62
Thermal Downlink C/N (dB)	3.43	13.9	13.9
Aggregated C/I Downlink (dB)	18.51	18.65	18.65
Downlink Propagation Losses (dB)	205.76	205.76	205.76
C/N+I Overall (dB)	2.91	5.09	5.09
E _p /N ₀ Overall (dB)	2.96	5.09	5.09
Clear Sky Link Margin (dB)	1.26	1.09	1.09

RAIN FADE ANALYSIS

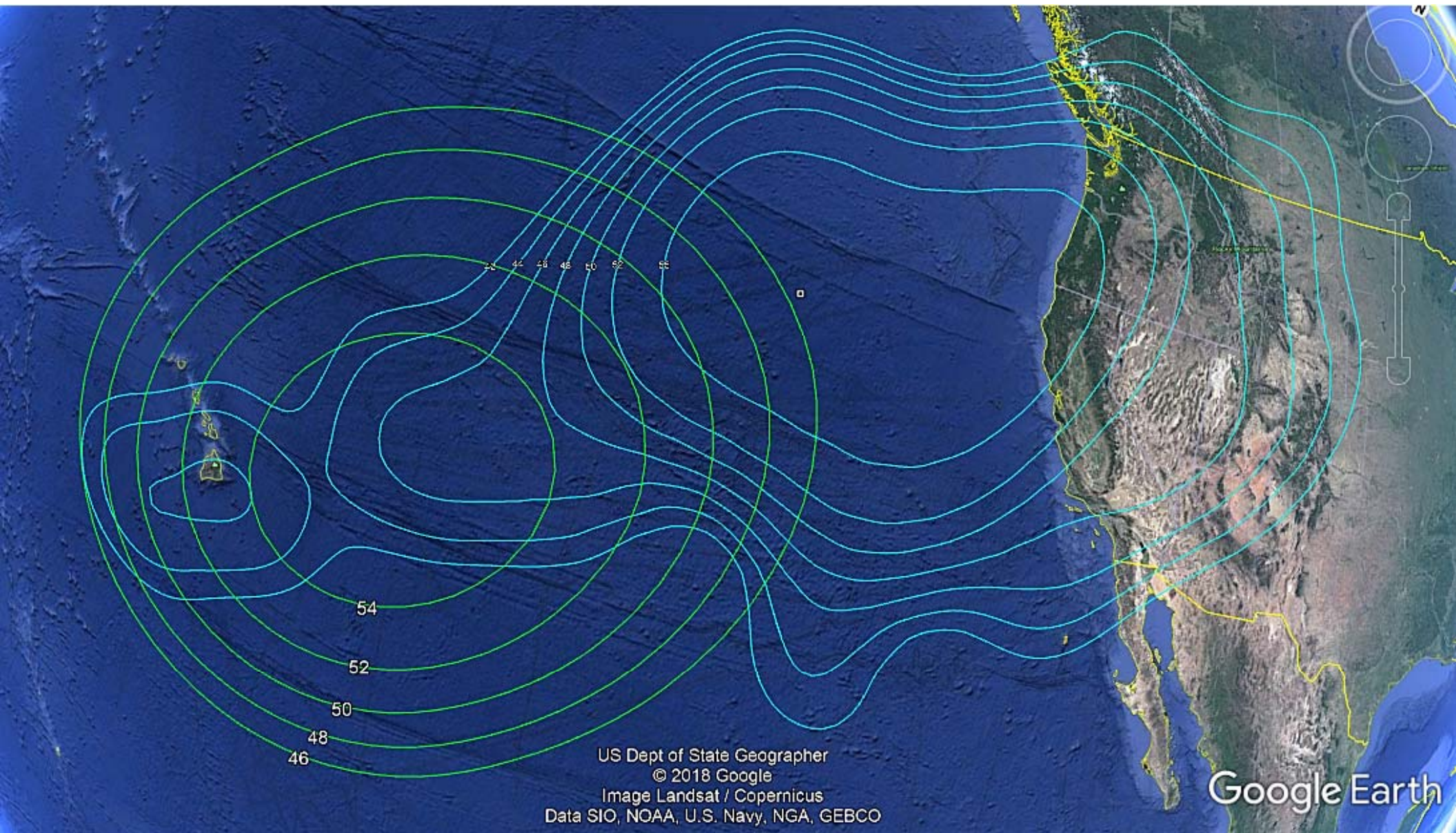
UPPC maximum rain fade compensation (dB)	10	0	0
Uplink Rain Fade assumed in Link Budget (dB)	11.26	1.09	1.09
Carrier IBO under assumed uplink rain fade (dB)	15.31	33.64	33.64
Carrier OBO under assumed uplink rain fade (dB)	10.61	28.94	28.94
Link Margin under assumed uplink rain Fade (dB)	0	0	0
Provision to downlink degradation due to interference scaled to downlink fade conditions (dB)	0.1	0.44	0.44
Downlink Rain Fade assumed in Link Budget (dB)	0.48	2.63	2.63
Downlink G/T degradation due to rain (dB)	0.91	2.38	2.38
Downlink C/N under assumed rain fade (dB)	2.03	8.88	8.88
Link Margin under assumed downlink Rain Fade (dB)	0	0	0

RAIN AVAILABILITY PREDICTION

Uplink reference rain rate (ITU-R P.837)	65.52	65.52	65.52
Availability corresponding to assumed uplink rain fade	99.981	98.745	98.745
Downlink reference rain rate (ITU-R P.837)	65.52	65.52	65.52
Availability corresponding to assumed downlink rain fade	97.286	99.772	99.772
Availability corresponding to assumed (uncorrelated) uplink and downlink rain fade	97.267	98.516	98.516

SUMMARY

Bandwidth (MHz)	15.6	1.33	1.33
Power Equivalent Bandwidth (MHz)	19.6	0.277	0.277



US Dept of State Geographer
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Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Google Earth