

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Comprehensive Nuclear Test Ban Treaty Org.
YIGO, GU
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
June 23, 2017

TABLE OF CONTENTS

| | |
|---|----|
| 1. CONCLUSIONS | 3 |
| 2. SUMMARY OF RESULTS | 4 |
| 3. SUPPLEMENTAL SHOWING | 5 |
| 4. EARTH STATION COORDINATION DATA..... | 6 |
| 5. CERTIFICATION..... | 12 |

1. CONCLUSIONS

An interference study considering all existing, proposed and prior coordinated microwave facilities within the coordination contours of the proposed earth station demonstrates that this site will operate satisfactorily with the common carrier microwave environment. Further, there will be no restrictions of its operation due to interference considerations.

2. SUMMARY OF RESULTS

A number of great circle interference cases were identified during the interference study of the proposed earth station. Each of the cases, which exceeded the interference objective on a line-of-sight basis, was profiled and the propagation losses estimated using NBS TN101 (Revised) techniques. The losses were found to be sufficient to reduce the signal levels to acceptable magnitudes in every case.

The following companies reported potential great circle interference conflicts that did not meet the objectives on a line-of-sight basis. When over-the-horizon losses are considered on the interfering paths, sufficient blockage exists to negate harmful interference from occurring with the proposed transmit-receive earth station.

Company

DoCoMo Pacific, Inc.

No other carriers reported potential interference cases.

3. SUPPLEMENTAL SHOWING

Pursuant to Part 25.203(c) of the FCC Rules and Regulations, the satellite earth station proposed in this application was coordinated by Comsearch using computer techniques and in accordance with Part 25 of the FCC Rules and Regulations.

Coordination data for this earth station was sent to the below listed carriers with a letter dated 06/09/2017.

Company

DoCoMo Pacific, Inc.

Micronesian Telecommunications Corp

PTI Pacifica Inc.

4. EARTH STATION COORDINATION DATA

This section presents the data pertinent to frequency coordination of the proposed earth station that was circulated to all carriers within its coordination contours.

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Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
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Date: 06/23/2017
Job Number: 170609COMSGE02

Administrative Information

Status ENGINEER PROPOSAL
Call Sign
Licensee Code CTBTO
Licensee Name Comprehensive Nuclear Test Ban Treaty Org.

Site Information YIGO, GU

Venue Name
Latitude (NAD 83) 13° 35' 16.0" N
Longitude (NAD 83) 144° 52' 7.0" E
Climate Zone C
Rain Zone 4
Ground Elevation (AMSL) 142.61 m / 467.9 ft

Link Information

Satellite Type Geostationary
Mode TR - Transmit-Receive
Modulation Digital
Satellite Arc 177° W to 206° West Longitude
Azimuth Range 106.7° to 145.6°
Corresponding Elevation Angles 43.6° / 70.8°
Antenna Centerline (AGL) 2.74 m / 9.0 ft

Antenna Information

| | Receive - FCC32 | Transmit - FCC32 |
|------------------------------------|----------------------|--------------------------|
| Manufacturer | Prodelin | Prodelin |
| Model | 1251 | 1251 |
| Gain / Diameter | 38.0 dBi / 2.4 m | 42.0 dBi / 2.4 m |
| 3-dB / 15-dB Beamwidth | 2.30° / 4.60° | 1.36° / 2.72° |
| Max Available RF Power (dBW/4 kHz) | | -10.0 |
| (dBW/MHz) | | 14.0 |
| Maximum EIRP (dBW/4 kHz) | | 32.0 |
| (dBW/MHz) | | 56.0 |
| Interference Objectives: | | |
| Long Term | -156.0 dBW/MHz 20% | -154.0 dBW/4 kHz 20% |
| Short Term | -146.0 dBW/MHz 0.01% | -131.0 dBW/4 kHz 0.0025% |

Frequency Information

| | Receive 4.0 GHz | Transmit 6.1 GHz |
|--|-------------------------------------|-------------------------------------|
| Emission / Frequency Range (MHz) | 87K0G7D - 100KG7D / 3700.0 - 4200.0 | 87K0G7D - 100KG7D / 5925.0 - 6425.0 |
| Max Great Circle Coordination Distance | 710.9 km / 441.7 mi | 299.6 km / 186.1 mi |
| Precipitation Scatter Contour Radius | 100.0 km / 62.1 mi | 100.0 km / 62.1 mi |

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Coordination Values

YIGO, GU

Licensee Name Comprehensive Nuclear Test Ban Treaty Or
Latitude (NAD 83) 13° 35' 16.0" N
Longitude (NAD 83) 144° 52' 7.0" E
Ground Elevation (AMSL) 142.61 m / 467.9 ft
Antenna Centerline (AGL) 2.74 m / 9.0 ft
Antenna Model Prodelin 2.4 meter
Antenna Mode Receive 4.0 GHz Transmit 6.1 GHz
Interference Objectives: Long Term -156.0 dBW/MHz 20% -154.0 dBW/4 kHz 20%
Short Term -146.0 dBW/MHz 0.01% -131.0 dBW/4 kHz 0.0025%
Max Available RF Power -10.0 (dBW/4 kHz)

| Azimuth (°) | Horizon Elevation (°) | Antenna Discrimination (°) | Receive 4.0 GHz | | Transmit 6.1 GHz | |
|-------------|-----------------------|----------------------------|--------------------|----------------------------|--------------------|----------------------------|
| | | | Horizon Gain (dBi) | Coordination Distance (km) | Horizon Gain (dBi) | Coordination Distance (km) |
| 0 | 0.23 | 96.95 | -10.00 | 690.63 | -10.00 | 244.98 |
| 0 | 0.23 | 102.03 | -10.00 | 690.63 | -10.00 | 244.98 |
| 5 | 0.26 | 98.46 | -10.00 | 673.57 | -10.00 | 238.27 |
| 5 | 0.26 | 101.66 | -10.00 | 673.57 | -10.00 | 238.27 |
| 10 | 0.21 | 94.84 | -10.00 | 705.15 | -10.00 | 217.98 |
| 10 | 0.21 | 106.36 | -10.00 | 705.15 | -10.00 | 217.98 |
| 15 | 0.25 | 91.21 | -10.00 | 675.51 | -10.00 | 248.03 |
| 15 | 0.25 | 111.02 | -10.00 | 675.51 | -10.00 | 248.03 |
| 20 | 0.00 | 87.58 | -10.00 | 710.92 | -10.00 | 232.85 |
| 20 | 0.00 | 114.94 | -10.00 | 710.92 | -10.00 | 232.85 |
| 25 | 0.29 | 83.94 | -10.00 | 649.83 | -10.00 | 234.62 |
| 25 | 0.29 | 117.58 | -10.00 | 649.83 | -10.00 | 234.62 |
| 30 | 0.39 | 80.32 | -10.00 | 590.77 | -10.00 | 241.11 |
| 30 | 0.39 | 120.04 | -10.00 | 590.77 | -10.00 | 241.11 |
| 35 | 0.39 | 76.74 | -10.00 | 585.20 | -10.00 | 240.81 |
| 35 | 0.39 | 122.33 | -10.00 | 585.20 | -10.00 | 240.81 |
| 40 | 0.40 | 73.21 | -10.00 | 580.25 | -10.00 | 236.79 |
| 40 | 0.40 | 124.40 | -10.00 | 580.25 | -10.00 | 236.79 |
| 45 | 0.40 | 69.75 | -10.00 | 580.20 | -10.00 | 249.01 |
| 45 | 0.40 | 126.16 | -10.00 | 580.20 | -10.00 | 249.01 |
| 50 | 0.39 | 66.38 | -10.00 | 585.18 | -10.00 | 251.07 |
| 50 | 0.39 | 127.67 | -10.00 | 585.18 | -10.00 | 251.07 |
| 55 | 0.36 | 63.12 | -10.00 | 603.36 | -10.00 | 248.18 |
| 55 | 0.36 | 128.88 | -10.00 | 603.36 | -10.00 | 248.18 |
| 60 | 0.26 | 60.04 | -10.00 | 672.74 | -10.00 | 251.87 |
| 60 | 0.26 | 129.74 | -10.00 | 672.74 | -10.00 | 251.87 |
| 65 | 0.27 | 57.07 | -10.00 | 664.70 | -10.00 | 252.73 |
| 65 | 0.27 | 130.05 | -10.00 | 664.70 | -10.00 | 252.73 |
| 70 | 0.23 | 54.31 | -10.00 | 689.02 | -10.00 | 229.85 |
| 70 | 0.23 | 130.49 | -10.00 | 689.02 | -10.00 | 229.85 |
| 75 | 0.25 | 51.74 | -10.00 | 674.87 | -10.00 | 252.73 |
| 75 | 0.25 | 129.98 | -10.00 | 674.87 | -10.00 | 252.73 |
| 80 | 0.32 | 49.39 | -10.00 | 633.89 | -10.00 | 244.57 |
| 80 | 0.32 | 129.62 | -10.00 | 633.89 | -10.00 | 244.57 |
| 85 | 0.28 | 47.44 | -9.90 | 662.22 | -10.00 | 252.73 |
| 85 | 0.28 | 128.46 | -9.90 | 662.22 | -10.00 | 252.73 |
| 90 | 0.36 | 45.72 | -9.50 | 615.15 | -10.00 | 252.73 |
| 90 | 0.36 | 127.20 | -9.50 | 615.15 | -10.00 | 252.73 |
| 95 | 0.50 | 44.33 | -9.17 | 536.68 | -10.00 | 252.73 |
| 95 | 0.50 | 125.63 | -9.17 | 536.68 | -10.00 | 252.73 |

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| | | | | | | |
|-----|------|--------|--------|--------|--------|--------|
| 100 | 0.68 | 43.31 | -8.91 | 481.52 | -10.00 | 252.73 |
| 100 | 0.68 | 123.79 | -8.91 | 481.52 | -10.00 | 252.73 |
| 105 | 0.82 | 42.78 | -8.78 | 444.76 | -10.00 | 252.73 |
| 105 | 0.82 | 121.70 | -8.78 | 444.76 | -10.00 | 252.73 |
| 110 | 1.04 | 42.64 | -8.75 | 397.78 | -10.00 | 252.73 |
| 110 | 1.04 | 119.39 | -8.75 | 397.78 | -10.00 | 252.73 |
| 115 | 1.02 | 43.21 | -8.89 | 398.66 | -10.00 | 252.73 |
| 115 | 1.02 | 116.89 | -8.89 | 398.66 | -10.00 | 252.73 |
| 120 | 0.93 | 44.30 | -9.16 | 415.01 | -10.00 | 252.73 |
| 120 | 0.93 | 114.24 | -9.16 | 415.01 | -10.00 | 252.73 |
| 125 | 1.04 | 45.61 | -9.48 | 388.45 | -10.00 | 252.73 |
| 125 | 1.04 | 111.44 | -9.48 | 388.45 | -10.00 | 252.73 |
| 130 | 0.99 | 47.47 | -9.91 | 392.28 | -10.00 | 252.73 |
| 130 | 0.99 | 108.53 | -9.91 | 392.28 | -10.00 | 252.73 |
| 135 | 0.98 | 49.62 | -10.00 | 393.03 | -10.00 | 252.73 |
| 135 | 0.98 | 105.52 | -10.00 | 393.03 | -10.00 | 252.73 |
| 140 | 0.87 | 52.13 | -10.00 | 419.81 | -10.00 | 252.73 |
| 140 | 0.87 | 102.44 | -10.00 | 419.81 | -10.00 | 252.73 |
| 145 | 0.85 | 54.82 | -10.00 | 424.25 | -10.00 | 252.73 |
| 145 | 0.85 | 99.29 | -10.00 | 424.25 | -10.00 | 252.73 |
| 150 | 0.84 | 57.71 | -10.00 | 426.29 | -10.00 | 243.43 |
| 150 | 0.84 | 96.14 | -10.00 | 426.29 | -10.00 | 243.43 |
| 155 | 0.85 | 60.77 | -10.00 | 424.39 | -10.00 | 206.88 |
| 155 | 0.85 | 92.92 | -10.00 | 424.39 | -10.00 | 206.88 |
| 160 | 0.98 | 63.93 | -10.00 | 393.33 | -10.00 | 196.71 |
| 160 | 0.98 | 89.67 | -10.00 | 393.33 | -10.00 | 196.71 |
| 165 | 0.96 | 67.28 | -10.00 | 398.23 | -10.00 | 188.90 |
| 165 | 0.96 | 86.41 | -10.00 | 398.23 | -10.00 | 188.90 |
| 170 | 0.79 | 70.52 | -10.00 | 435.60 | -10.00 | 206.05 |
| 170 | 0.79 | 83.18 | -10.00 | 435.60 | -10.00 | 206.05 |
| 175 | 0.68 | 72.72 | -10.00 | 466.06 | -10.00 | 197.11 |
| 175 | 0.68 | 79.97 | -10.00 | 466.06 | -10.00 | 197.11 |
| 180 | 0.51 | 73.86 | -10.00 | 516.39 | -10.00 | 182.66 |
| 180 | 0.51 | 76.79 | -10.00 | 516.39 | -10.00 | 182.66 |
| 185 | 0.44 | 73.63 | -10.00 | 552.31 | -10.00 | 159.44 |

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Short Term -146.0 dBW/MHz 0.01% -131.0 dBW/4 kHz 0.0025%
Max Available RF Power -10.0 (dBW/4 kHz)

| Azimuth (°) | Horizon Elevation (°) | Antenna Discrimination (°) | Receive 4.0 GHz | | Transmit 6.1 GHz | |
|-------------|-----------------------|----------------------------|--------------------|----------------------------|--------------------|----------------------------|
| | | | Horizon Gain (dBi) | Coordination Distance (km) | Horizon Gain (dBi) | Coordination Distance (km) |
| 185 | 0.44 | 74.96 | -10.00 | 552.31 | -10.00 | 159.44 |
| 190 | 0.40 | 70.55 | -10.00 | 575.56 | -10.00 | 145.32 |
| 190 | 0.40 | 76.15 | -10.00 | 575.56 | -10.00 | 145.32 |
| 195 | 0.48 | 67.26 | -10.00 | 531.65 | -10.00 | 126.01 |
| 195 | 0.48 | 77.36 | -10.00 | 531.65 | -10.00 | 126.01 |
| 200 | 0.45 | 63.44 | -10.00 | 551.29 | -10.00 | 123.68 |
| 200 | 0.45 | 78.73 | -10.00 | 551.29 | -10.00 | 123.68 |
| 205 | 0.40 | 59.31 | -10.00 | 577.75 | -10.00 | 138.49 |
| 205 | 0.40 | 80.18 | -10.00 | 577.75 | -10.00 | 138.49 |
| 210 | 0.24 | 54.92 | -10.00 | 686.53 | -10.00 | 139.40 |
| 210 | 0.24 | 81.74 | -10.00 | 686.53 | -10.00 | 139.40 |
| 215 | 0.00 | 50.39 | -10.00 | 710.92 | -10.00 | 138.43 |
| 215 | 0.00 | 83.36 | -10.00 | 710.92 | -10.00 | 138.43 |
| 220 | 0.00 | 45.89 | -10.00 | 710.92 | -9.54 | 139.10 |
| 220 | 0.00 | 84.93 | -10.00 | 710.92 | -9.54 | 139.10 |
| 225 | 0.00 | 41.44 | -10.00 | 710.92 | -8.43 | 132.72 |
| 225 | 0.00 | 86.53 | -10.00 | 710.92 | -8.43 | 132.72 |
| 230 | 0.00 | 37.13 | -10.00 | 710.92 | -7.24 | 139.14 |
| 230 | 0.00 | 88.16 | -10.00 | 710.92 | -7.24 | 139.14 |
| 235 | 0.00 | 32.97 | -10.00 | 710.92 | -5.95 | 142.72 |
| 235 | 0.00 | 89.80 | -10.00 | 710.92 | -5.95 | 142.72 |
| 240 | 0.00 | 29.14 | -10.00 | 710.92 | -4.61 | 164.99 |
| 240 | 0.00 | 91.44 | -10.00 | 710.92 | -4.61 | 164.99 |
| 245 | 0.00 | 25.54 | -10.00 | 710.92 | -3.18 | 164.27 |
| 245 | 0.00 | 93.07 | -10.00 | 710.92 | -3.18 | 164.27 |
| 250 | 0.00 | 22.49 | -10.00 | 710.92 | -1.80 | 172.36 |
| 250 | 0.00 | 94.68 | -10.00 | 710.92 | -1.80 | 172.36 |
| 255 | 0.00 | 20.41 | -10.00 | 710.92 | -0.75 | 206.44 |
| 255 | 0.00 | 96.26 | -10.00 | 710.92 | -0.75 | 206.44 |
| 260 | 0.00 | 19.30 | -10.00 | 710.92 | -0.14 | 229.31 |
| 260 | 0.00 | 97.80 | -10.00 | 710.92 | -0.14 | 229.31 |
| 265 | 0.00 | 19.45 | -10.00 | 710.92 | -0.22 | 253.35 |
| 265 | 0.00 | 99.28 | -10.00 | 710.92 | -0.22 | 253.35 |
| 270 | 0.00 | 20.75 | -10.00 | 710.92 | -0.93 | 284.48 |
| 270 | 0.00 | 100.69 | -10.00 | 710.92 | -0.93 | 284.48 |
| 275 | 0.00 | 23.00 | -10.00 | 710.92 | -2.04 | 299.58 |
| 275 | 0.00 | 102.03 | -10.00 | 710.92 | -2.04 | 299.58 |
| 280 | 0.23 | 25.89 | -10.00 | 689.54 | -3.33 | 276.11 |
| 280 | 0.23 | 103.44 | -10.00 | 689.54 | -3.33 | 276.11 |
| 285 | 0.00 | 29.39 | -10.00 | 710.92 | -4.70 | 282.06 |

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|-----|------|--------|--------|--------|--------|--------|
| 285 | 0.00 | 104.44 | -10.00 | 710.92 | -4.70 | 282.06 |
| 290 | 0.29 | 33.21 | -10.00 | 650.00 | -6.03 | 276.57 |
| 290 | 0.29 | 105.72 | -10.00 | 650.00 | -6.03 | 276.57 |
| 295 | 0.00 | 37.26 | -10.00 | 710.92 | -7.28 | 256.12 |
| 295 | 0.00 | 106.42 | -10.00 | 710.92 | -7.28 | 256.12 |
| 300 | 0.20 | 41.51 | -10.00 | 708.69 | -8.45 | 250.02 |
| 300 | 0.20 | 107.41 | -10.00 | 708.69 | -8.45 | 250.02 |
| 305 | 0.22 | 45.85 | -10.00 | 699.05 | -9.53 | 218.54 |
| 305 | 0.22 | 108.10 | -10.00 | 699.05 | -9.53 | 218.54 |
| 310 | 0.21 | 50.31 | -10.00 | 706.58 | -10.00 | 209.68 |
| 310 | 0.21 | 108.64 | -10.00 | 706.58 | -10.00 | 209.68 |
| 315 | 0.21 | 54.85 | -10.00 | 701.21 | -10.00 | 207.81 |
| 315 | 0.21 | 109.04 | -10.00 | 701.21 | -10.00 | 207.81 |
| 320 | 0.26 | 59.44 | -10.00 | 668.80 | -10.00 | 207.82 |
| 320 | 0.26 | 109.34 | -10.00 | 668.80 | -10.00 | 207.82 |
| 325 | 0.25 | 64.07 | -10.00 | 679.57 | -10.00 | 209.68 |
| 325 | 0.25 | 109.42 | -10.00 | 679.57 | -10.00 | 209.68 |
| 330 | 0.25 | 68.73 | -10.00 | 680.37 | -10.00 | 210.60 |
| 330 | 0.25 | 109.36 | -10.00 | 680.37 | -10.00 | 210.60 |
| 335 | 0.27 | 73.42 | -10.00 | 662.97 | -10.00 | 229.79 |
| 335 | 0.27 | 109.17 | -10.00 | 662.97 | -10.00 | 229.79 |
| 340 | 0.28 | 78.14 | -10.00 | 658.18 | -10.00 | 252.73 |
| 340 | 0.28 | 108.82 | -10.00 | 658.18 | -10.00 | 252.73 |
| 345 | 0.22 | 82.82 | -10.00 | 698.66 | -10.00 | 239.29 |
| 345 | 0.22 | 108.25 | -10.00 | 698.66 | -10.00 | 239.29 |
| 350 | 0.35 | 87.53 | -10.00 | 610.68 | -10.00 | 250.52 |
| 350 | 0.35 | 107.72 | -10.00 | 610.68 | -10.00 | 250.52 |
| 355 | 0.26 | 92.24 | -10.00 | 672.78 | -10.00 | 238.56 |
| 355 | 0.26 | 105.58 | -10.00 | 672.78 | -10.00 | 238.56 |

5. CERTIFICATION

I HEREBY CERTIFY THAT I AM THE TECHNICALLY QUALIFIED PERSON RESPONSIBLE FOR THE PREPARATION OF THE FREQUENCY COORDINATION DATA CONTAINED IN THIS APPLICATION, THAT I AM FAMILIAR WITH PARTS 101 AND 25 OF THE FCC RULES AND REGULATIONS, THAT I HAVE EITHER PREPARED OR REVIEWED THE FREQUENCY COORDINATION DATA SUBMITTED WITH THIS APPLICATION, AND THAT IT IS COMPLETE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

BY: _____

Gary K. Edwards
Senior Manager
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147

DATED: June 23, 2017