

Cellular mast emissions survey: Airport Radar



Document details

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1 Executive summary

The Jersey Competition and Regulatory Authority or JCRA regularly monitors emission levels from the cellular masts in Jersey¹ to ensure the mobile network operators who operate their services from those masts comply with their license obligations in terms of power levels and that the levels from the sites meet the internationally recognised standards and guidelines regarding health and safety limits for the public.

In 2017, the JCRA commissioned surveys to measure the electromagnetic field (EMF) emission levels at all the sites hosting mobile telecommunication equipment within the island. Further surveys have been conducted in each subsequent year focussing on new sites, those where significant changes have been made by the operators or those where the public have raised concerns to the JCRA in the previous year. This report presents the results of the survey conducted at the Airport Radar site in 2025.

In 2025, the Jersey mobile network operators have launched their first commercial 5G services. This year's audits therefore include the frequency bands used for 5G, noting however that not all sites currently have 5G transmitting equipment.

The Airport Radar site was used by multiple operators at the time of the survey: Airtel, JT and Sure. Surveys were conducted at all cellular frequency bands (700, 800, 900, 1800, 2100, 2600 and 3400MHz) for all mobile cellular technologies (2G, 3G, 4G and 5G) and for all three cellular operators as a routine procedure. Even though the reported levels are expected to be predominantly emitted from this site, the test equipment does not discriminate between nearby sites which means that the levels are cumulated over all site emissions detected by the test instrument.

The survey established that the emission levels around the site were very low and well below the safety limits for the public advised by internationally recognised standards.

The values shown hereafter are the maximum levels recorded around the site following a peak search. The levels were found to be lower at all the other locations round this site. The recorded values are true at the time of testing and can go up or down depending on the level of user activity on the site.

The total Exposure Quotient (EQ) for the site recorded across all detected cellular frequency bands is given at the bottom of the summary table below. A total EQ close to 1 (one) for the site would mean that emission levels approach the safety limit advised by ICNIRP in their guidelines.

Table 1 – Total EQ by frequency band

Site Name	Band [MHz]	Max E-field in band [V/m]	Operator at Max E-field	ICNIRP Limit Relative to Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Airport Radar	700	0.3225	JT	121	0.000988937	1/ 1011
	800	0.355	JT	110	0.002085683	1/ 479
	900	0.7767	JT	53	0.00206572	1/ 484
	1800	0.1888	JT	309	0.000473016	1/ 2114
	2100	0.1568	JT	389	0.000267494	1/ 3738
	2600	0.07414	JT	823	4.16866E-05	1/ 23989
	3400	0.3419	JT	114	0.000752743	1/ 1328
Total Site EQ					0.006675277	1/ 150

¹ Prior to 1 July 2020, the JCRA and the Guernsey Competition & Regulatory Authority coordinated their activities in the Channel Islands as the Channel Islands Competition Regulatory Authorities (CICRA). Earlier reports may refer to CICRA rather than JCRA.

The results show that the total EQ was measured at 0.667% of ICNIRP's *General Public* Reference Levels (or about 1/150) and the site therefore remains safe.

The graphs which follow show the activity on all the frequency bands surveyed. The plots are colour-coded for easy identification of the operator. On each plot, the solid red line represents the Airtel activity, the light blue is JT, the dark blue is Sure, the light grey is Clear (Clear only operates in the 2100MHz band) and the green line is Newtel (Newtel only operates a license in the 3400MHz band). Note however that not all operators are present in each frequency band, but the colour assigned to each operator remains the same throughout.

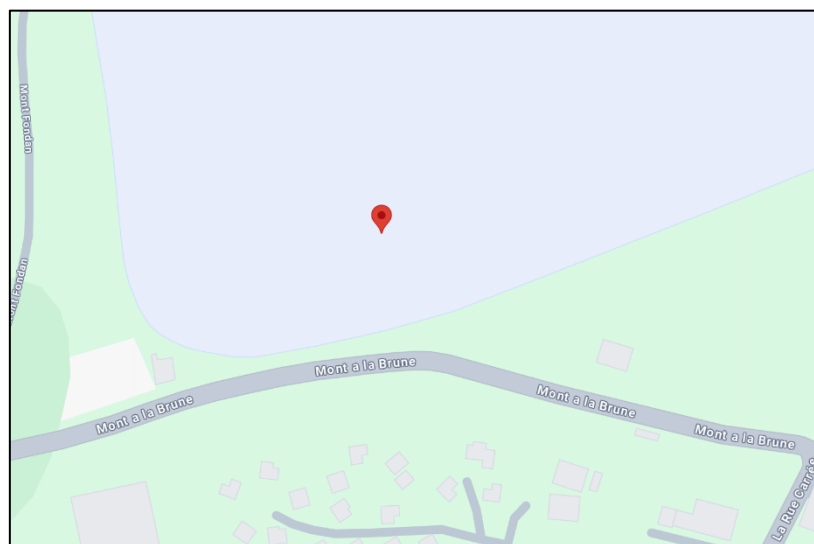
ICNIRP's *General Public* Reference Level is also shown as the dashed line at the top of the graphs. For clarity, each step on the vertical axis represents a 10-fold increase. The same scaling and colour scheme will be used on the plots throughout this report.

The graphs are also supported by the equivalent statistical tables derived from the measured levels at the site for added clarity.

2 Site details

2.1 Site location

Figure 1 – Map of the site area



Site name:	Airport Radar
Site address:	Le Mont a la Brune, Jersey Airport
Site latitude:	49.203876
Site longitude:	-2.202447

2.2 Site description

Operators:	Airtel / JT / Sure
Antenna types:	Directional Antenna
Approximate height:	17m
Site type:	Lattice Mast
Description:	The Lattice Mast at the Airport Radar Tower is located within the airport's secure perimeter, access to the public is restricted.

2.3 Site photo

Figure 2 – Location of the peak where emission levels were measured.



2.4 Test location

Figure 3 – Survey area with spot measurement markers



As part of the peak search procedure, spot measurements were taken at locations around the antennas as shown on the above sketch.

The blue triangle is the antenna location, yellow lines are the walk route, and the red circle is the spot where the highest spot search reading was obtained and where the detailed survey was carried out.

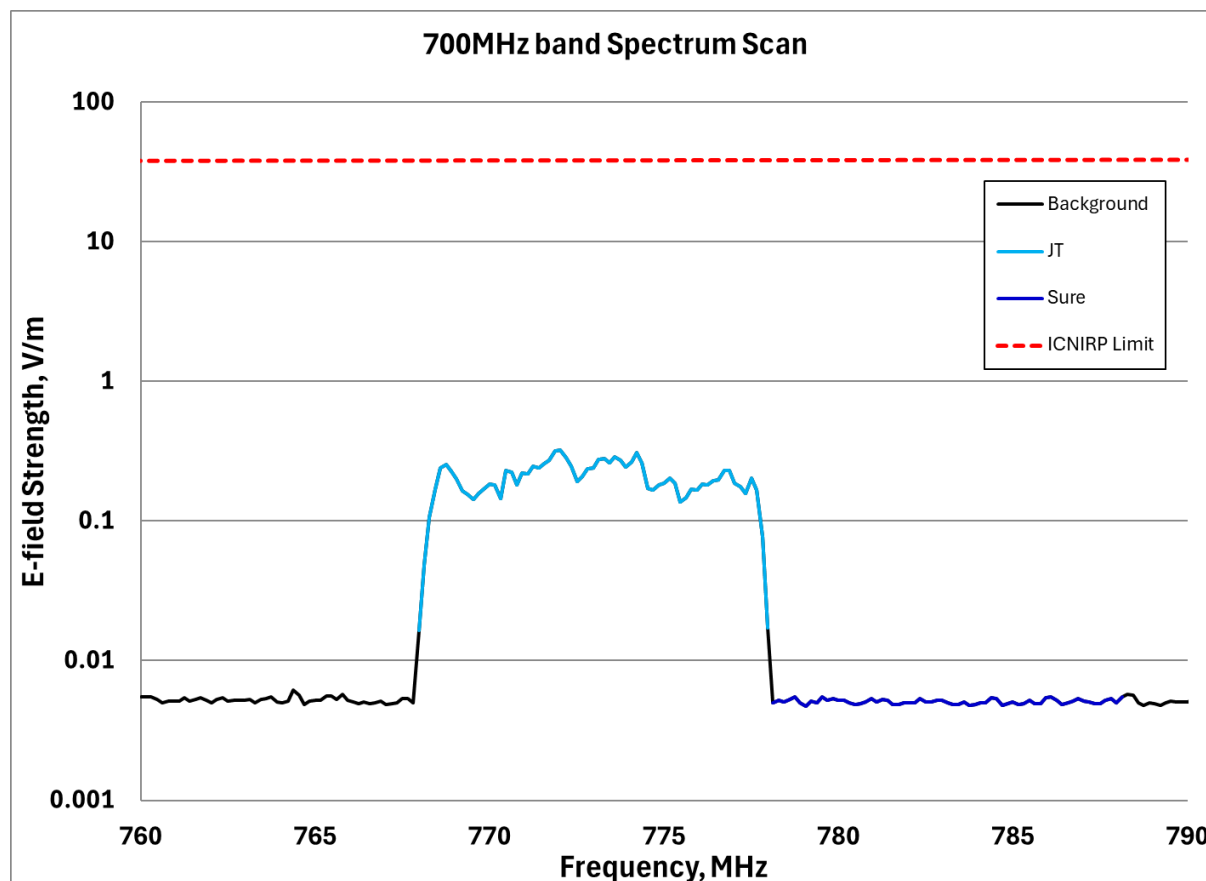
The spectrum readings reported further down this report were recorded over a period of six minutes as advised by ICNIRP.

3 Survey results

3.1 700MHz band

The graph for the 700MHz activity is shown below with the E-field strength levels measured at the site plotted on a logarithmic scale.

Figure 4 – 700MHz band spectrum scan



No field level recorded across the band was higher than 0.3225 V/m (JT), which is 121 times smaller than the ICNIRP Reference Level.

The EQ results for the 700MHz band are shown below.

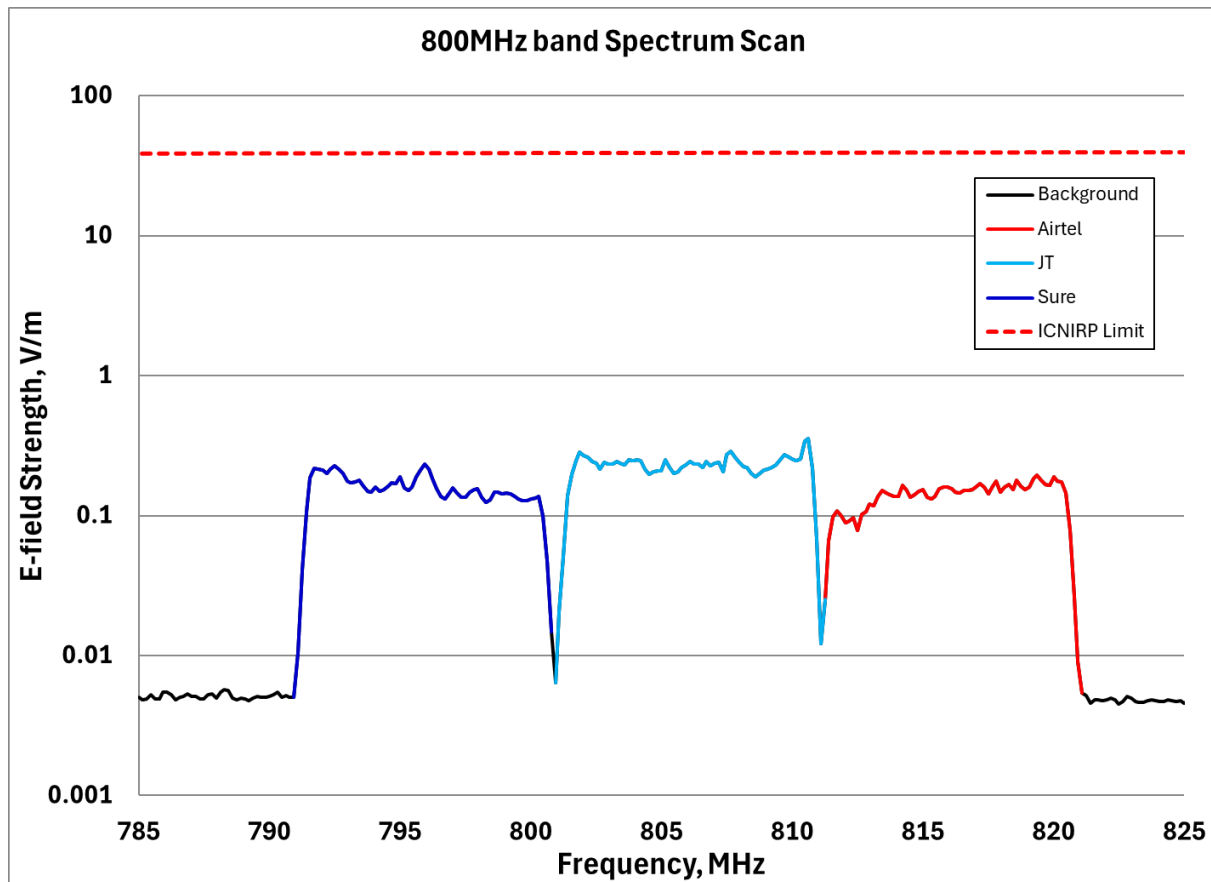
Table 2 – 700MHz band exposure quotient at Airport Radar

Site Name	Operator	Band [MHz]	Max E-field Strength [V/m]	ICNIRP Limit Relative to Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Airport Radar	JT	700	0.3225	121	0.000988367	1/ 1012
	Sure		0.005494	7079	5.69924E-07	1/ 1754619
	total band EQ					0.000988937

3.2 800MHz band

The graph for the 800MHz activity is shown below.

Figure 5 – 800MHz band spectrum scan



No field level recorded across the band was higher than 0.355 V/m (JT), which is 110 times smaller than the ICNIRP Reference Level.

The EQ results for the 800MHz band are shown below.

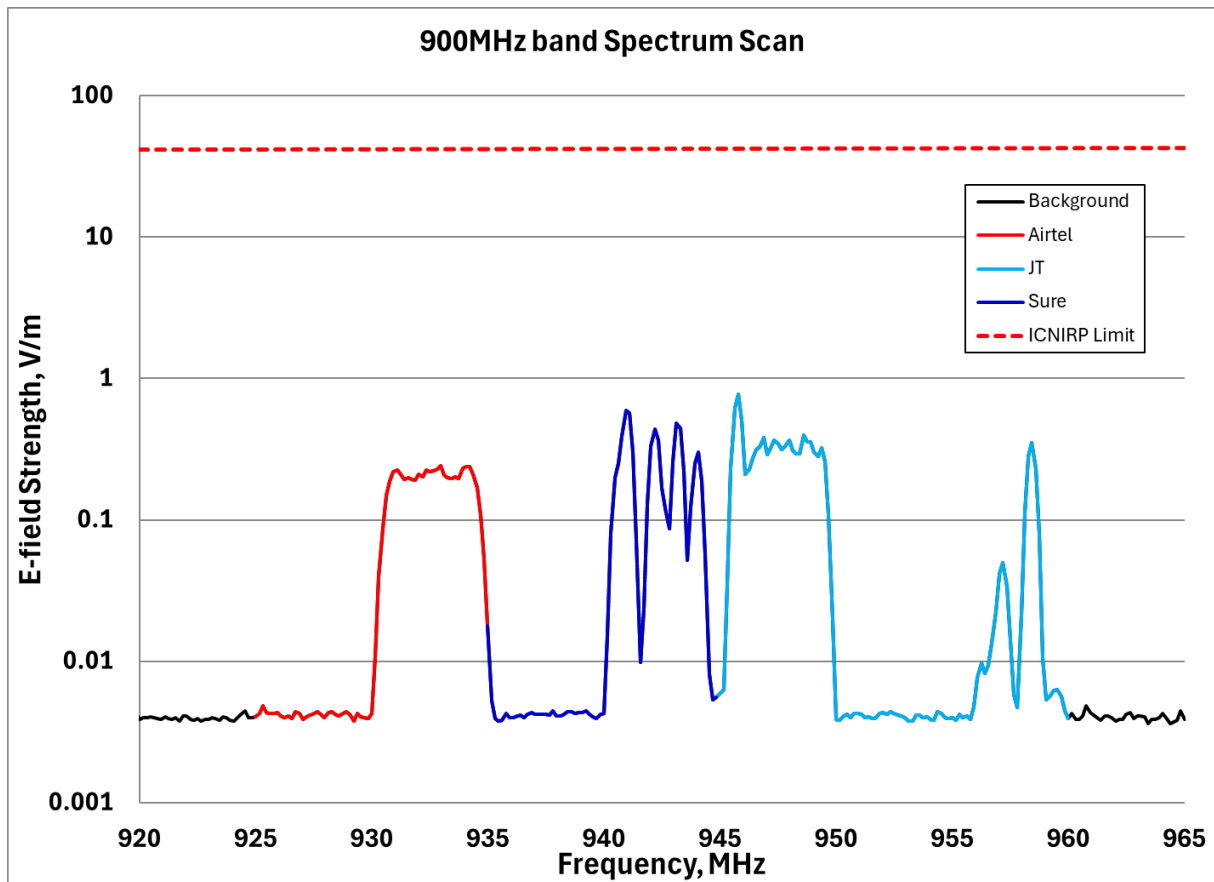
Table 3 – 800MHz band exposure quotient at Airport Radar

Site Name	Operator	Band [MHz]	Max E-field Strength [V/m]	ICNIRP Limit Relative to Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Airport Radar	Airtel	800	0.1946	200	0.000416289	1/ 2402
	JT		0.355	110	0.001135519	1/ 881
	Sure		0.2335	167	0.000533875	1/ 1873
total band EQ					0.002085683	1/ 479

3.3 900MHz band

The graph for the 900MHz activity is shown below.

Figure 6 – 900MHz band spectrum scan



No field level recorded across the band was higher than 0.7767 V/m (JT), which is 53 times smaller than the ICNIRP Reference Level.

The EQ results for the 900MHz band are shown below.

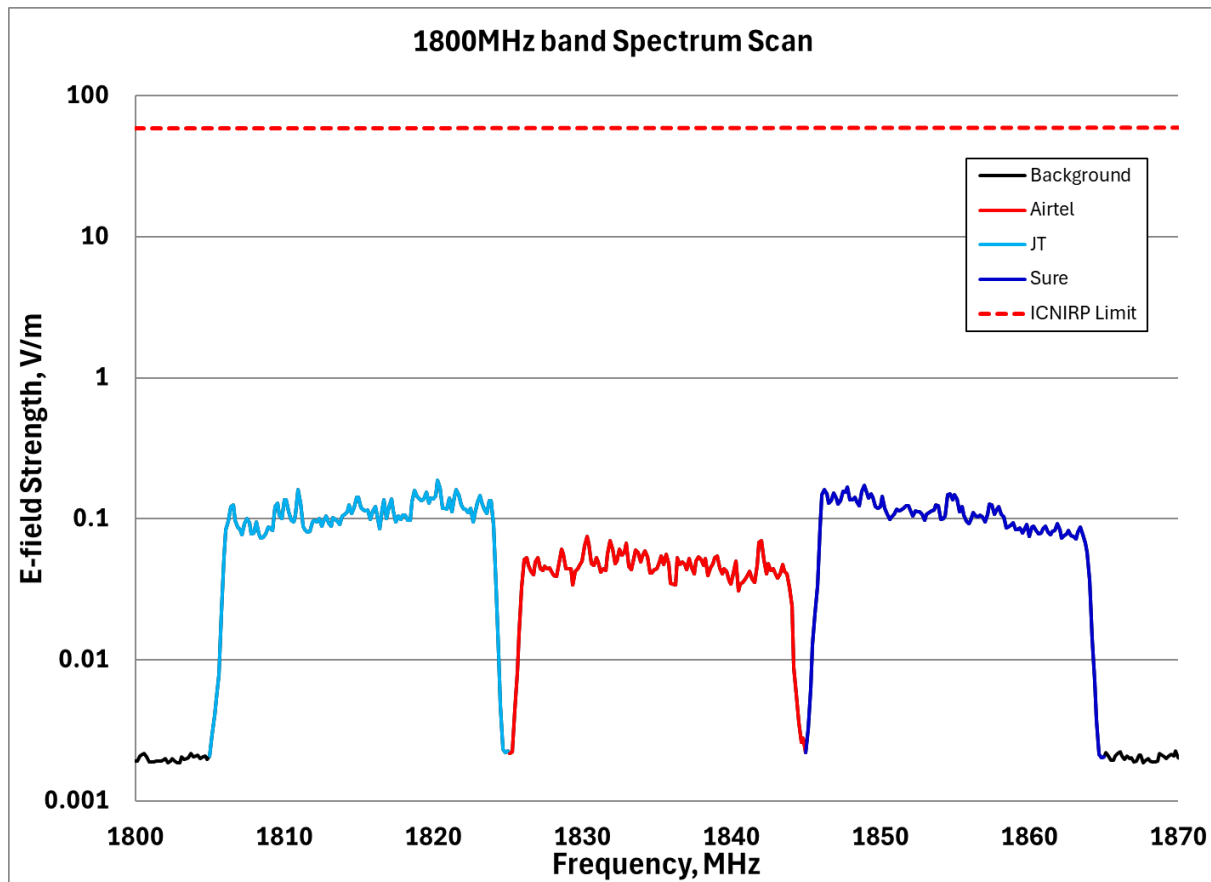
Table 4 – 900MHz band exposure quotient at Airport Radar

Site Name	Operator	Band [MHz]	Max E-field Strength [V/m]	ICNIRP Limit Relative to Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Airport Radar	Airtel	900	0.2412	171	0.000329319	1/ 3037
	JT		0.7767	53	0.001089718	1/ 918
	Sure		0.5972	69	0.000646683	1/ 1546
total band EQ					0.00206572	1/ 484

3.4 1800MHz band

The graph for the 1800MHz activity around the site is shown below.

Figure 7 – 1800MHz spectrum scan



No field level recorded across the band was higher than 0.1888 V/m (JT), which is 309 times smaller than the ICNIRP Reference Level.

The EQ results for the 1800MHz band are shown below.

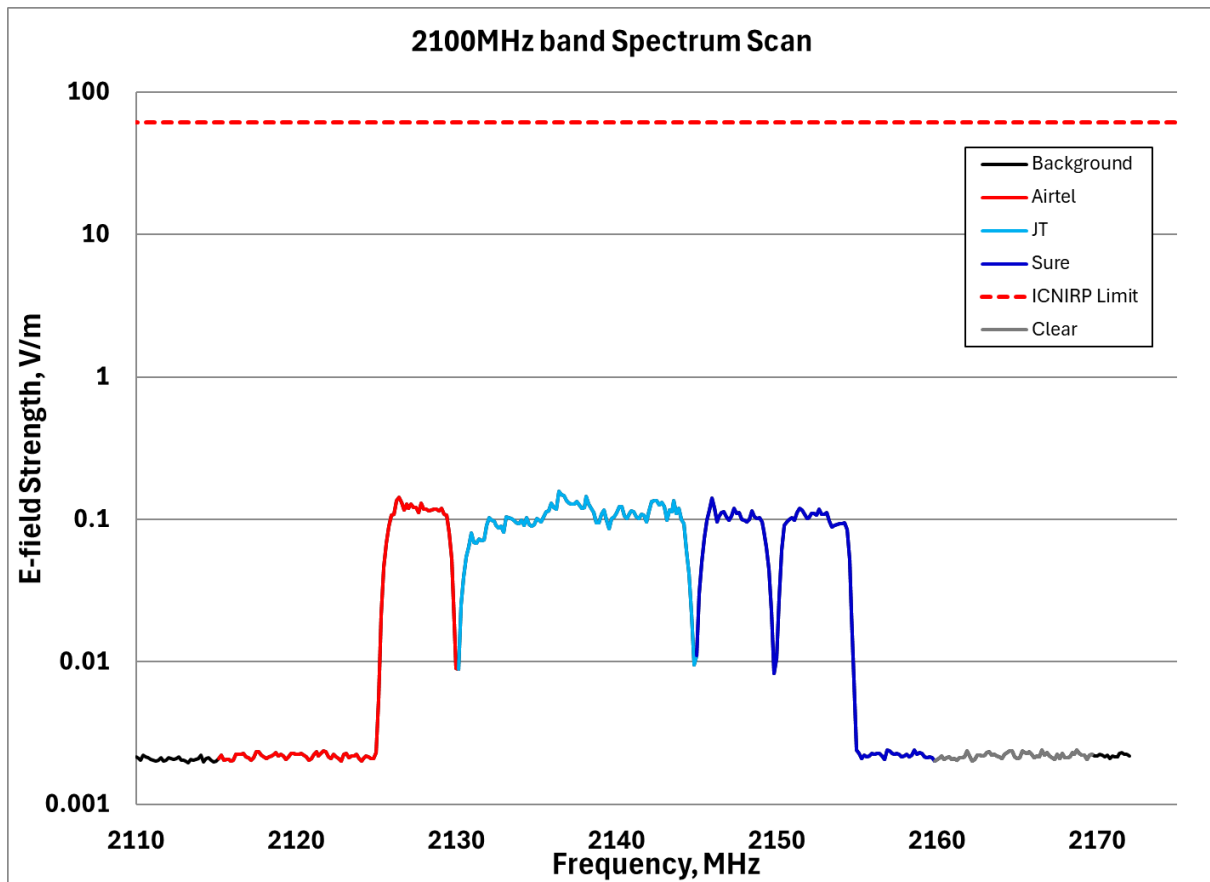
Table 5 – 1800MHz band exposure quotient at Airport Radar

Site Name	Operator	Band [MHz]	Max E-field Strength [V/m]	ICNIRP Limit Relative to Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Airport Radar	Airtel	1800	0.0746	782	3.8749E-05	1/ 25807
	JT		0.1888	309	0.000222564	1/ 4493
	Sure		0.1726	338	0.000211703	1/ 4724
total band EQ					0.000473016	1/ 2114

3.5 2100MHz band

The graph for the 2100MHz band activity around the site is shown below.

Figure 8 – 2100MHz band spectrum scan



No field level recorded across the band was higher than 0.1568 V/m (JT), which is 389 times smaller than the ICNIRP Reference Level.

The EQ results for the 2100MHz band are shown below.

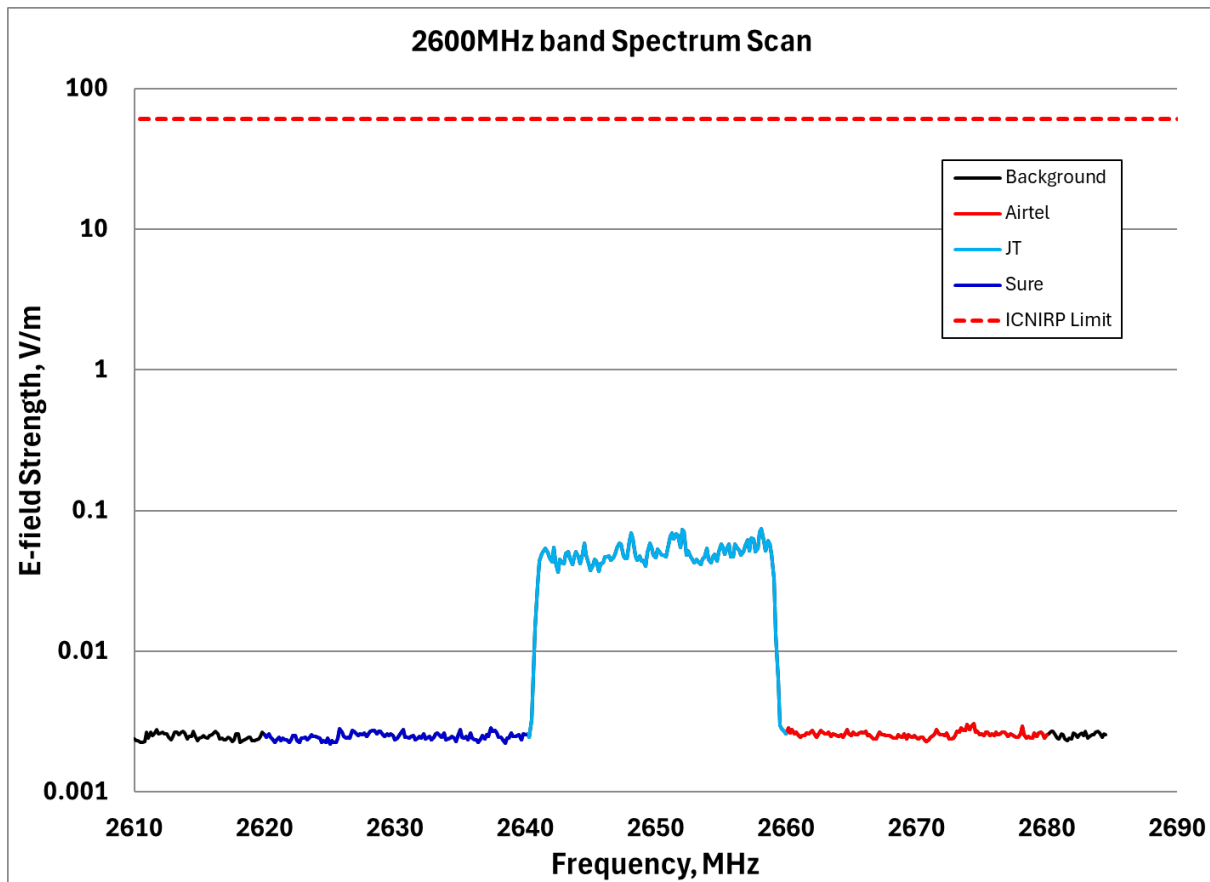
Table 6 – 2100MHz band exposure quotient at Airport Radar

Site Name	Operator	Band [MHz]	Max E-field Strength [V/m]	ICNIRP Limit Relative to Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Airport Radar	Airtel	2100	0.1431	426	4.82453E-05	1/ 20727
	Clear		0.002416	25248	4.17103E-08	1/ 23974917
	JT		0.1568	389	0.000142267	1/ 7029
	Sure		0.1414	431	7.69399E-05	1/ 12997
total band EQ					0.000267494	1/ 3738

3.6 2600MHz band

The graph for the 2600MHz band activity around the site is shown below.

Figure 9 – 2600MHz band spectrum scan



No field level recorded across the band was higher than 0.07414 V/m (JT), which is 823 times smaller than the ICNIRP Reference Level.

The EQ results for the 2600MHz band are shown below.

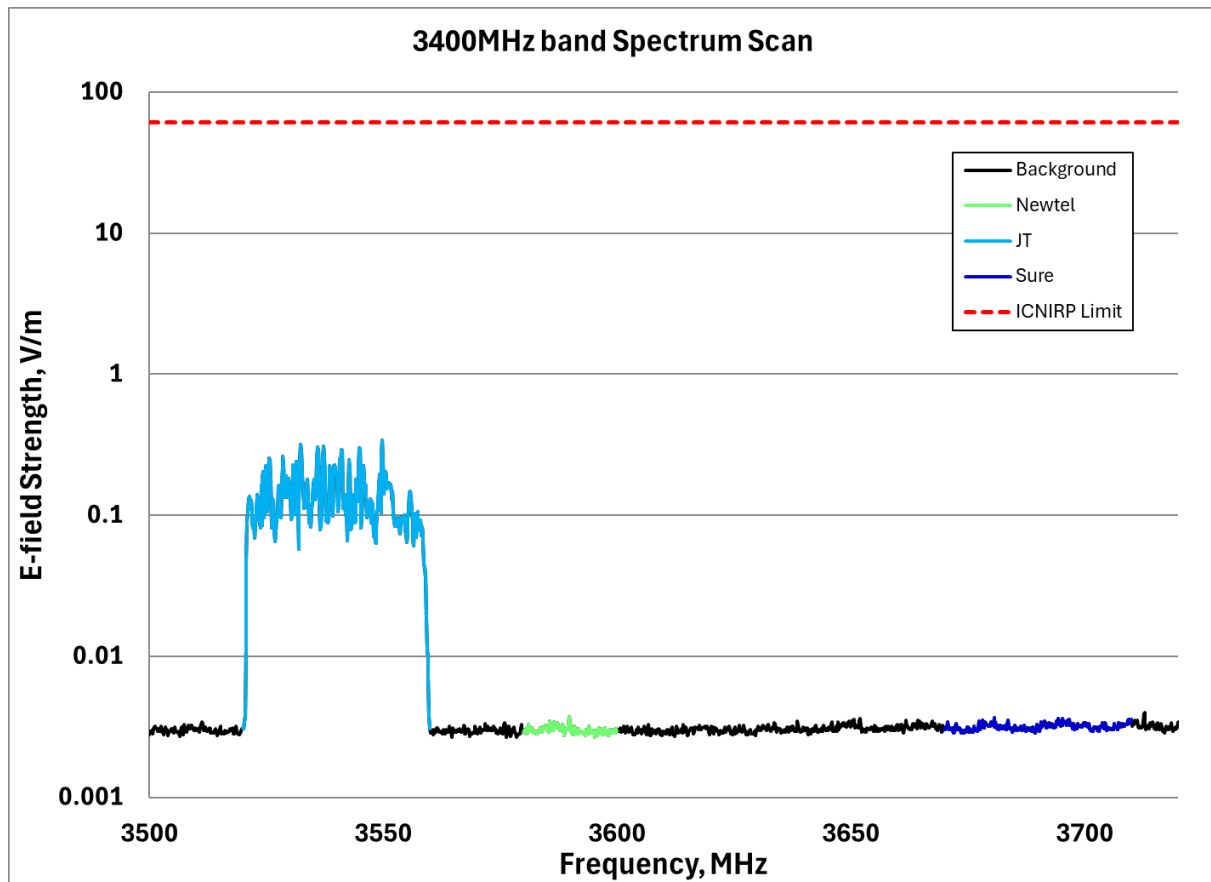
Table 7 – 2600MHz band exposure quotient at Airport Radar

Site Name	Operator	Band [MHz]	Max E-field Strength [V/m]	ICNIRP Limit Relative to Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Airport Radar	Airtel	2600	0.003075	19837	1.14665E-07	1/ 8721036
	JT		0.07414	823	4.14654E-05	1/ 24116
	Sure		0.002873	21232	1.06537E-07	1/ 9386368
total band EQ					4.16866E-05	1/ 23989

3.7 3400MHz band

The graph for the 3400-3800MHz band activity around the site is shown below.

Figure 10 – 3400MHz band spectrum scan



No field level recorded across the band was higher than 0.3419 V/m (JT), which is 114 times smaller than the ICNIRP Reference Level.

The EQ results for the 3400MHz band are shown below.

Table 8 – 3400MHz band exposure quotient at Airport Radar

Site Name	Operator	Band [MHz]	Max E-field Strength [V/m]	ICNIRP Limit Relative to Max E-field	Band Exposure Quotient	Band EQ Relative to ICNIRP
Airport Radar	Newtel	3400	0.003725	10441	1.56082E-07	1/ 6406887
	JT		0.3419	114	0.000752239	1/ 1329
	Sure		0.003655	10640	3.47213E-07	1/ 2880081
total band EQ					0.000752743	1/ 1328

END