سلطنة عُمان
Sultanate of Oman

هيئة تنظيم الاتصالات
Telecommunications Regulatory Authority

Mobile Network
Benchmarking Report for Salalah during Khareef 2013

Background

This report is based on a drive test activity conducted in Salalah for checking MNO's network performance, preparation and delivered QoS during Khareef 2013.

The tests were conducted on voice and data networks of Omantel and Nawras in Salalah city.

Drive Test Procedure

Conducted By: Telecommunication Regulatory Authority, Quality of Service

Location: Salalah City

Test Date & Time: 18th August 2013 to 22nd August 2013, 7:30 A.M. Onwards

Test Purpose: To check QoS of Licensees Mobile Networks

Test Equipment: TEMS Investigation 11.0, Sony Ericsson W995 Handsets (Vocie and 3G data) + Huawei LTE USB E3276 (Commercial LTE USB device)

Test Configuration Voice: Dual Mode (3G + 2G) with 90 sec. repetitive calls with 30 sec. idle duration between them to allow mobile handset to reselect to 3G mode.

Test Configuration Data: 3G locked with throughput and ping tests.

Drive test plot Convention

Received Signal Level 2G

2G VOICE - - RxLevSub (dBm)		
	Range	Penetration
	>= -75	INDOOR
	>=-82 and <-75	
	>=-95 and <-82	IN CAR
	>=95	OUTDOOR only

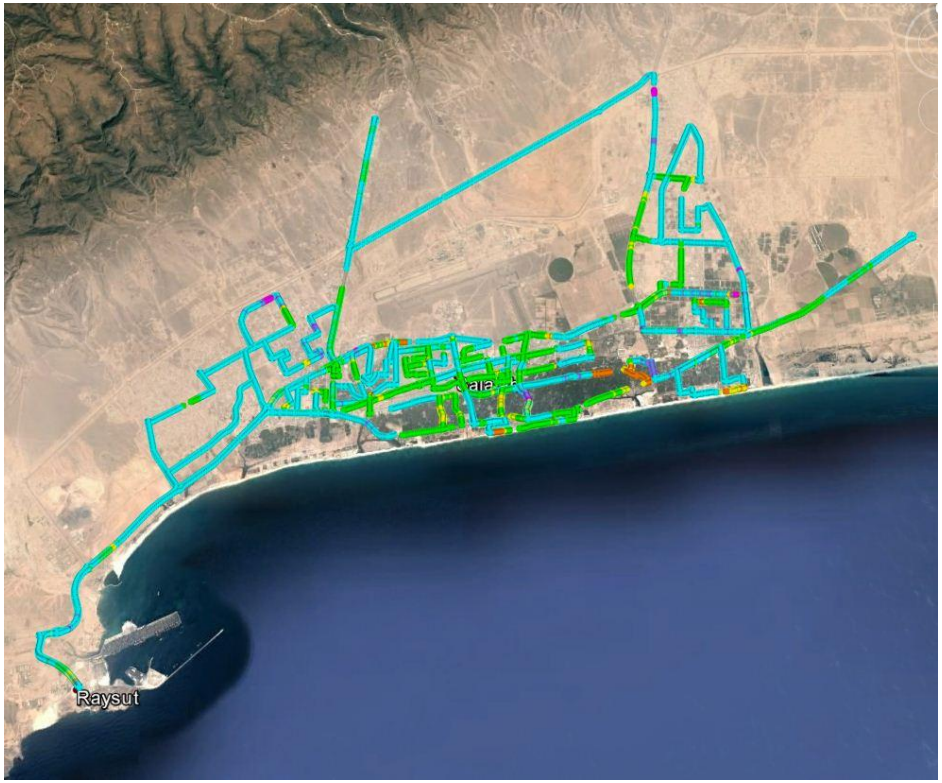
Received Signal Level 3G

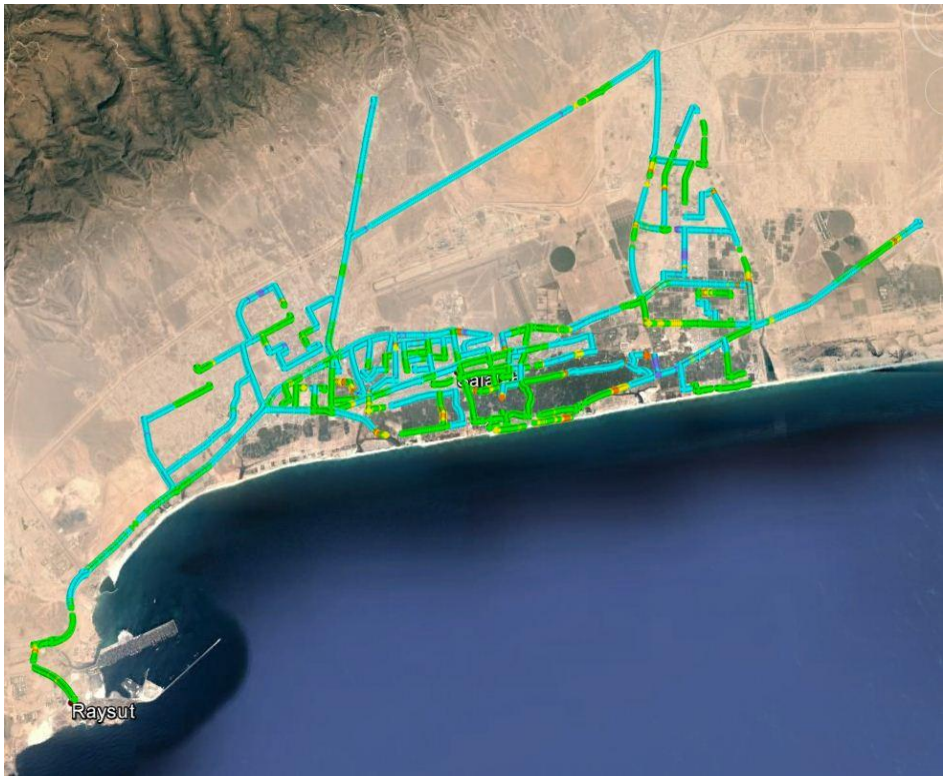
3G VOICE - - CPICH RSCP (dBm)		
	Range	Penetration
	>= -80	INDOOR
	>=-87 and <-80	
	>=-100 and <-87	IN CAR
	>=-100	OUTDOOR only

Received Signal Strength 2G/3G

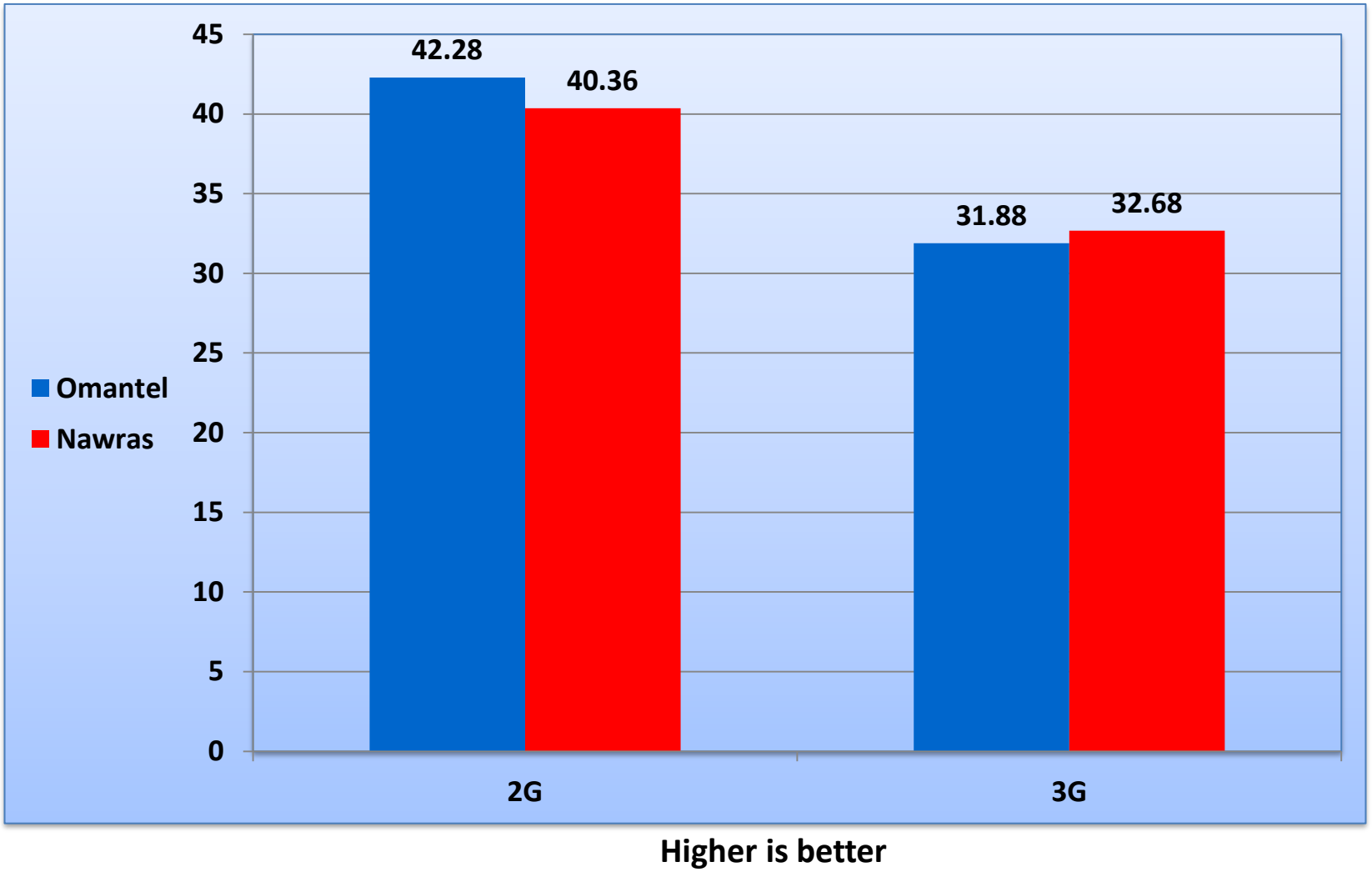
عمانتل
Omantel

النورس
nawras

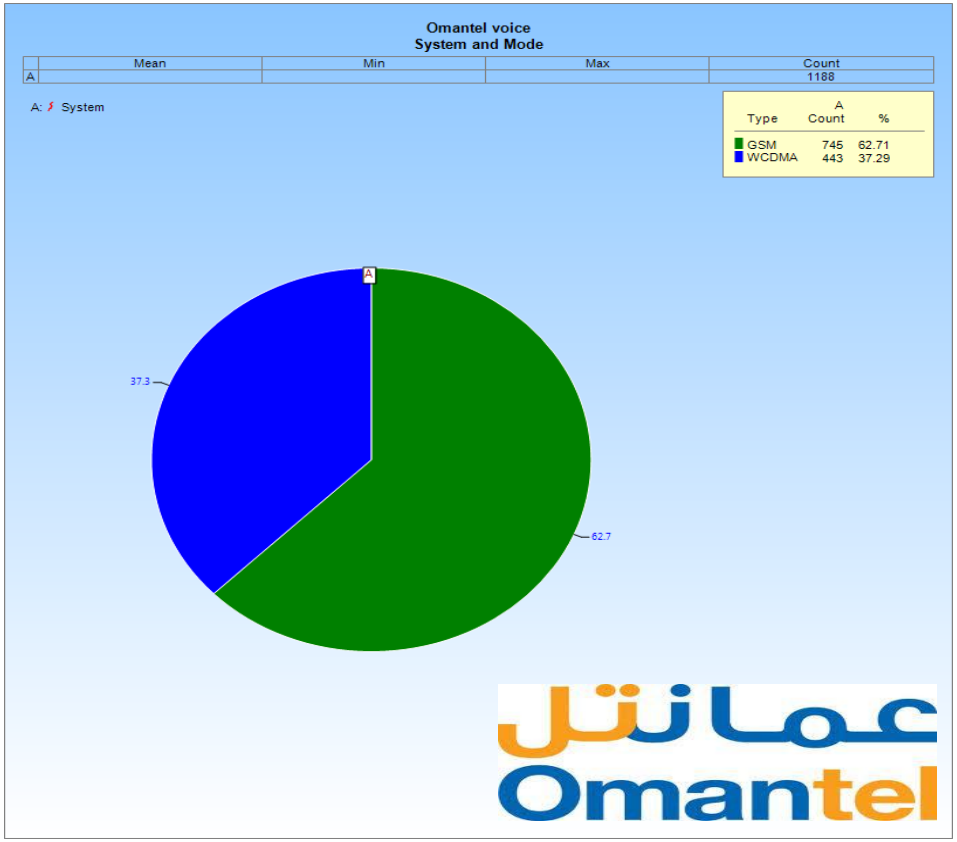


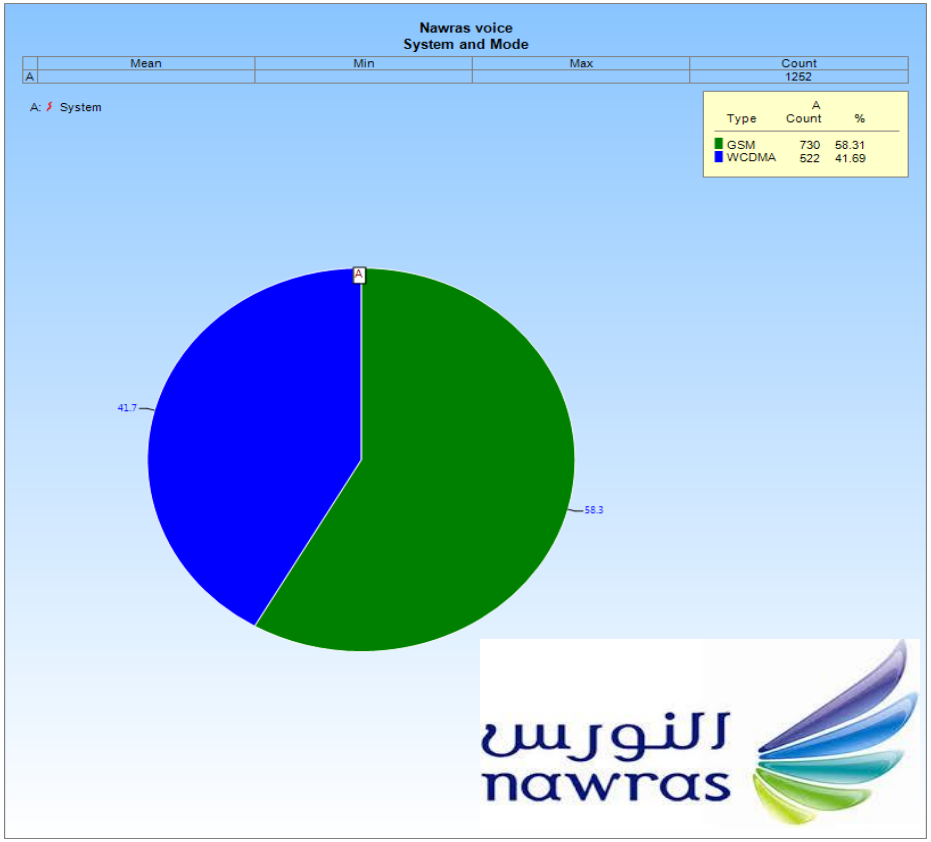


Mean Received Signal Strength 2G/3G



Technology Utilization – Voice Test



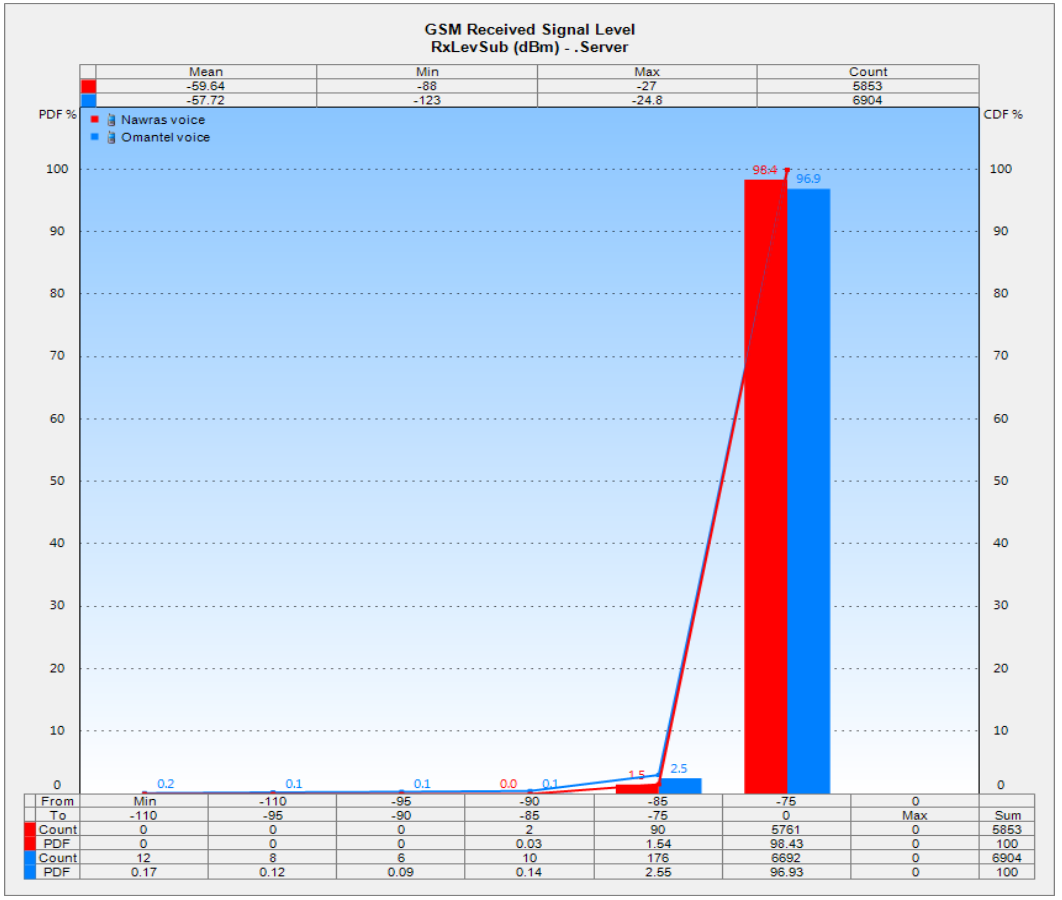


The above chart shows technology utilization in dual mode for voice tests.

Received Signal Strength for 2G

This is a representation of received signal strength for 2G in a histogram.

Higher number of samples in 0 to -75 range on right hand side of the graph indicate stronger signal.

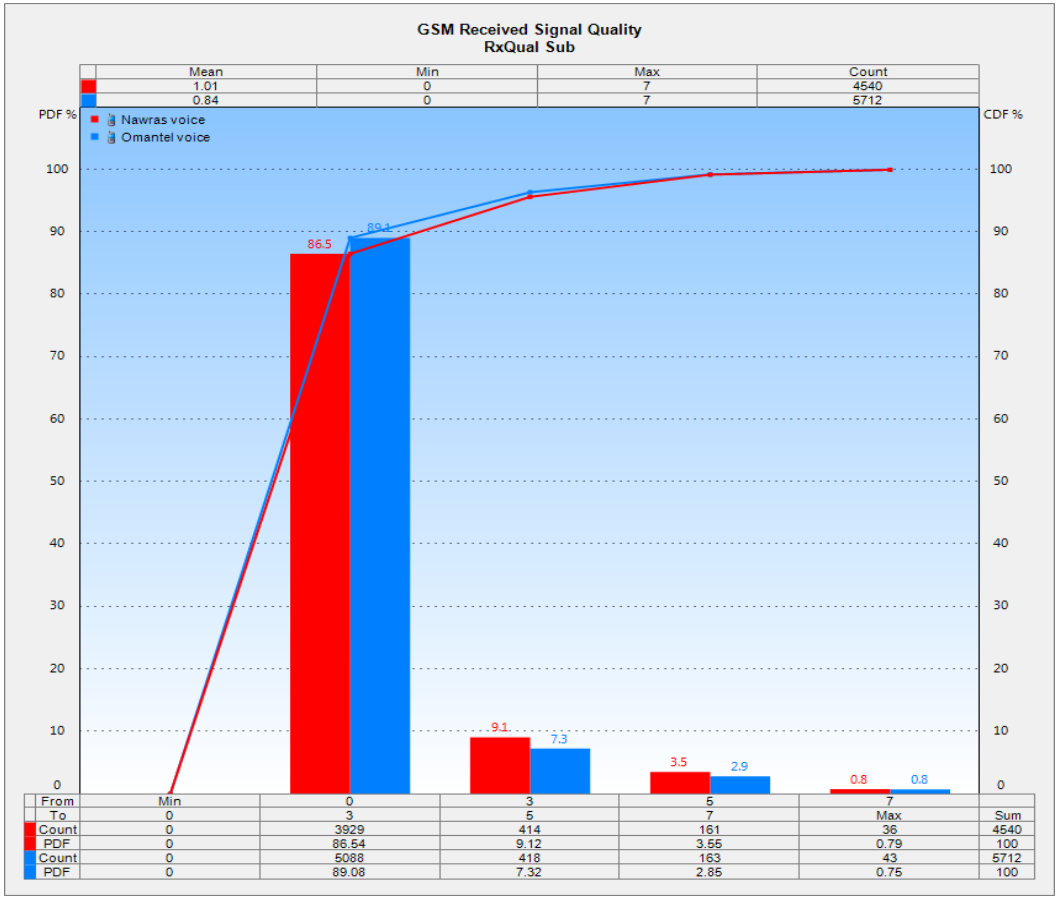


Received Signal Quality for 2G

This is a representation of received signal quality for 2G in a histogram.

Higher number of samples in 0 to 3 range on the left hand side of the graph indicate better quality.

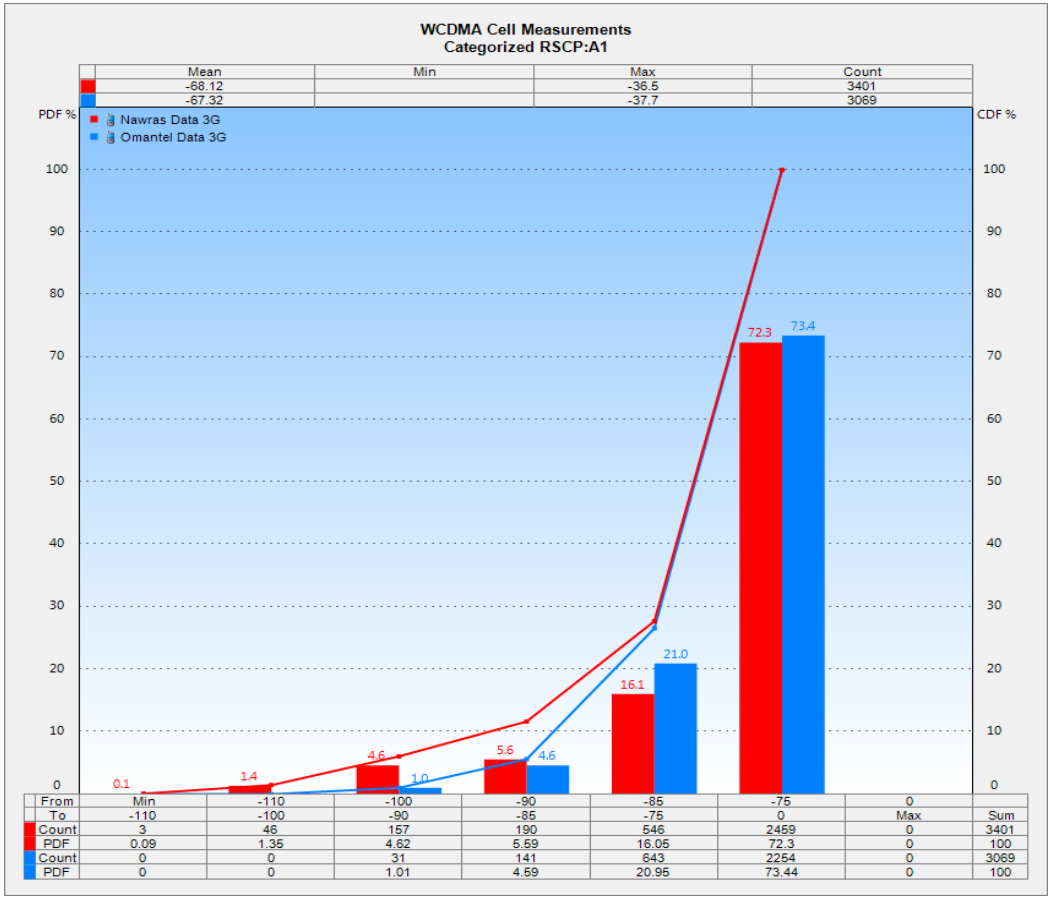
The signal quality may degrade because of frequency interference originating from the licensees own network, poor signal strength etc.



Received Signal Strength for 3G

This is a representation of received signal strength for 3G in a histogram.

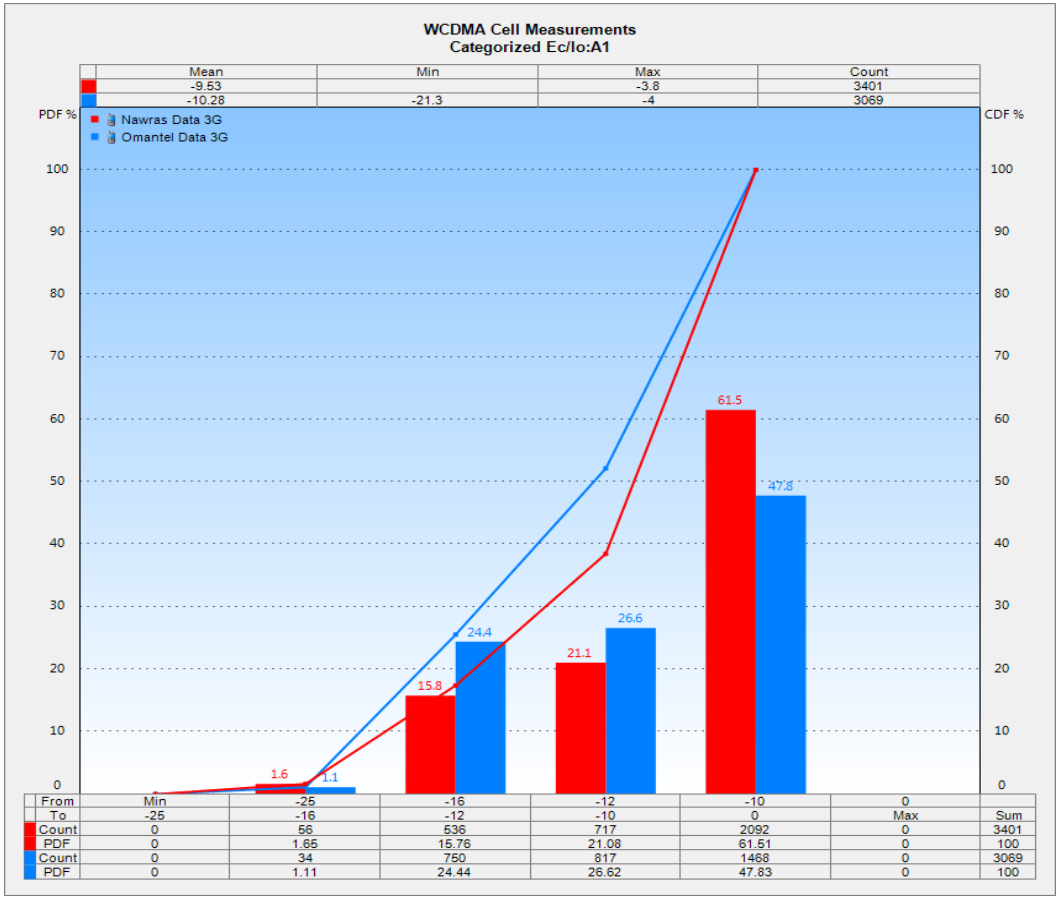
Higher number of samples in 0 to -75 range on right hand side of the screen indicate stronger signal.



Received Signal Quality for 3G

This is a representation of received signal quality for 3G in a histogram.

Signal quality is considered good above -12.

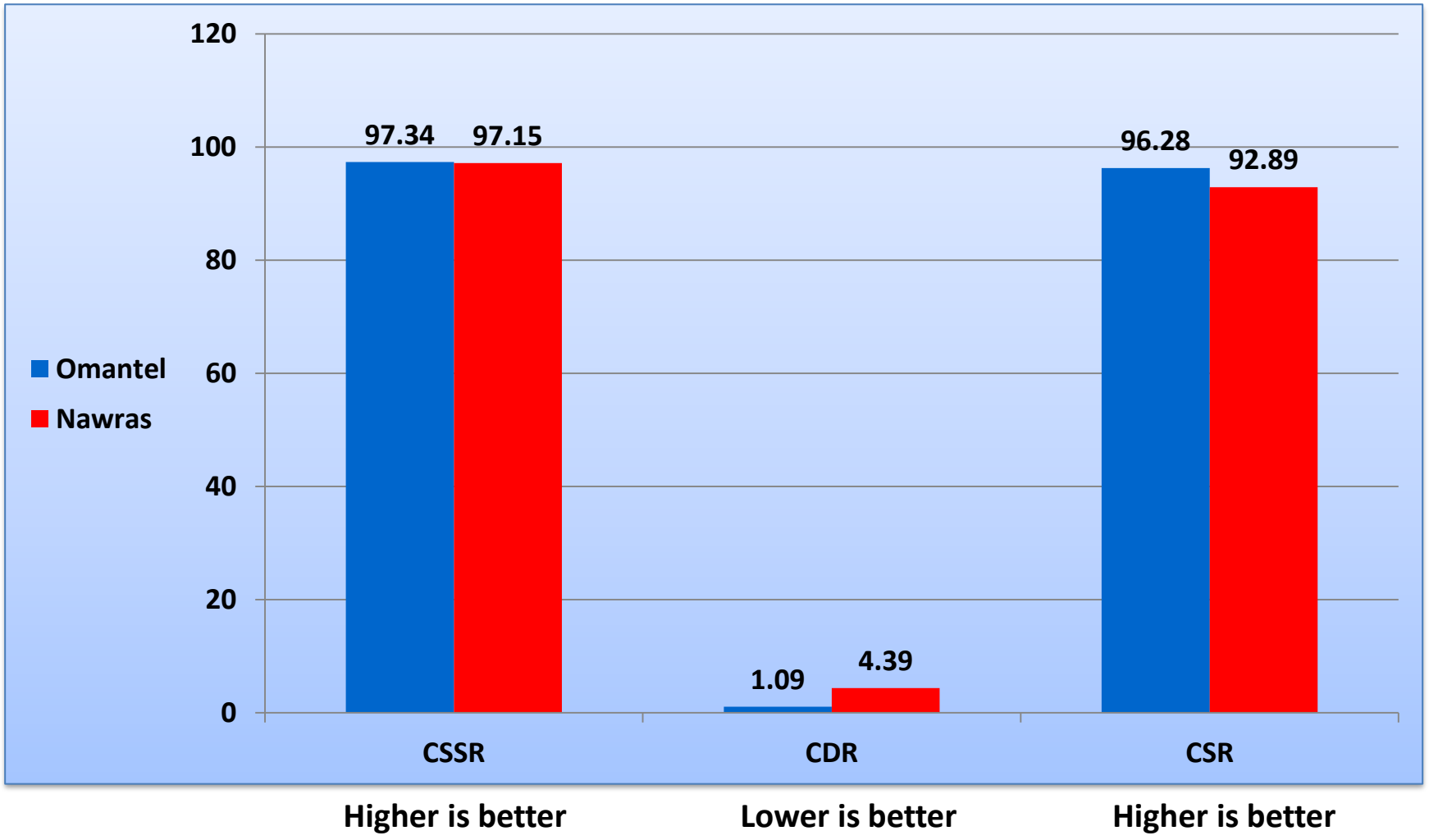


Voice Test Statistics & KPIs

		Omantel	Nawras
MO Calls	Call Attempts	188	211
	No. of Successful Call Setup	183	205
	Calls Dropped	2	9
	CSSR %	97.34	97.15
	CDR %	1.09	4.39
	CSR %	96.28	92.89

- **CSSR**: Call Setup Success Rate – This KPI indicates the total number of successful call establishments as a ratio of the total number of call attempts made.
- **CDR**: Call Drop Rate – This KPI indicates the total number of calls dropped (not ending as desired by the user) or forced call disconnection by the network due to various reasons within the licensees own network.
- **CSR**: Call Success Rate: This KPI covers both CSSR and CDR to give an overall end to end view of the total calls successfully ended after being successfully established.

Voice Test KPI Graphs

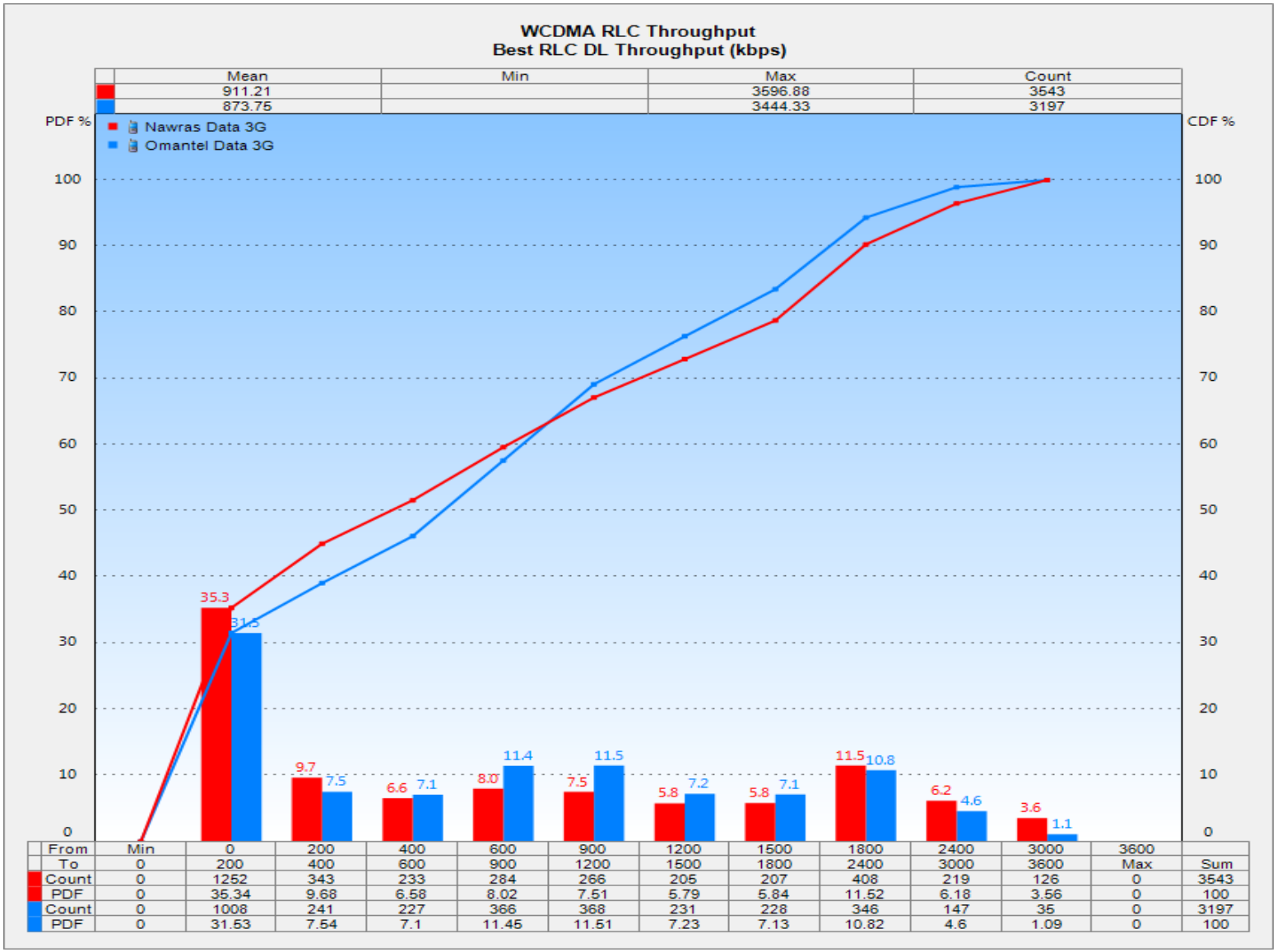


Data Test Statistics Table

3G Mobile		Omantel 3G	Nawras 3G
Ping	Mean Packet Latency (ms)	167.35	169.89
HTTP Download	Mean Downlink throughput (kbps)	873	911
LTE static		**Omantel LTE**	**Nawras LTE**
Ping	Mean Packet Latency (ms)	32.12	78.67
HTTP Download	Mean Downlink throughput (Mbps)	33.42	13.10

- Mean Packet Latency: Packet latency is specified as a time required for a packet to travel from source to destination. If the total packet delay (round trip time) is averaged over the total transmission times, the resultant figure is the mean packet latency.
- Mean Downlink throughput: This is the average downlink throughput (rate at which the bits are transferred to the user) experienced by a user while downloading content from the Internet.

3G Data test (http) downlink throughput distribution-kbps



From	Min	0	200	400	600	900	1200	1500	1800	2400	3000	3600	
To	0	200	400	600	900	1200	1500	1800	2400	3000	3600	Max	Sum
Count	0	1252	343	233	284	266	205	207	408	219	126	0	3543
PDF	0	35.34	9.68	6.58	8.02	7.51	5.79	5.84	11.52	6.18	3.56	0	100
Count	0	1008	241	227	366	368	231	228	346	147	35	0	3197
PDF	0	31.53	7.54	7.1	11.45	11.51	7.23	7.13	10.82	4.6	1.09	0	100

Result Interpretation

- Drive Test results indicate network behavior on a particular day and a particular instance of time and does not account for changing traffic trends over the period of time.
- Network level stats may vary depending on the overall network performance based on an hour, day, week, month or quarter.
- The Benchmarking data is provided for beneficiaries understanding and comparison of the Operators network coverage, call quality, reliability and service availability in their respective areas.