



**Global RF Solutions<sup>SM</sup>**

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## **Evaluation of Human Exposure to Radio Frequency Emissions**



**Analysis of KSLX-FM  
Phoenix, AZ**

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# **1. SUMMARY AND CONCLUSION**

## **Summary:**

FCC Licensee Hubbard Radio Phoenix, LLC (KSLX-FM), operating as FCC facility ID number 11282, under Construction Permit File number BXPB-20141029ABA, is required to perform RF field strength measurements as a condition of the licensing of the new auxiliary backup transmitter. An analysis of this Communications Facility has been completed to determine the FCC Compliance impact of the operating mode of the auxiliary FM transmitter (KSLX-FM) on a guyed tower (Tower 1) approximately 420' AGL. KSLX-FM is licensed as a C class operator for 12kW ERP at 100.7 MHz, and will use an auxiliary FM broadcast antenna with a radiation center of approximately 354' AGL on the tower. The existing RF environment includes a transmitter (KZON 101.5 FM) on a nearby guyed tower (Tower 2), as well as Sprint directional antennas in the PCS band (on Tower B).

The impact analysis is in terms of the compliance guidelines set forth by the Federal Communications Commission (FCC) with regards to maximum human exposure limits. This determination of FCC Compliance has been made via ground level field survey measurements performed with a Narda SRM-3000, PN3001/01 selective radiation meter serial #N-0016 and an SRM E-Field Probe PN3501/02 serial #H-0367. The meter and probe are properly calibrated until 02/14/2016 and 02/13/2016, respectively. The field survey was performed on Tuesday, November 25<sup>th</sup>, 2014 at and around 10:00, with the auxiliary transmitter active, and on Tuesday, April 28<sup>th</sup>, 2015 at and around 10:00, with the main transmitter active.

## **Conclusion:**

The site is a mountaintop location with restricted access, by rule requiring RF Safety trained personnel to supervise any and all activity on the grounds. As a worst-case, assuming the possibility of a lapse in the rules, the ground level survey has been performed using the FCC Public standard. Note that FCC Occupational levels can be calculated by dividing the FCC Public numbers shown in this report by 5.

Using Narda SRM-3000 measurements in numerous areas at and around the towers KSLX-FM was found to exceed FCC limits in two locations, specifically at the northern and southeastern guy anchors for Tower 1. At both of these locations, the RF levels were found to exceed the FCC Public limits, with either the auxiliary or main transmitters active. In order to attain compliance, KSLX-FM has constructed a barrier restricting access to within 5' of these two anchors. The measured levels outside the delineation of this barrier are safely below the FCC Public limit. Notice signs with contact information have been posted, visible at all approaches to these barriers.

# 1. SUMMARY AND CONCLUSION (Continued)

As a result, **KSLX-FM is compliant with FCC Guidelines** with the operation of either the auxiliary antenna at the power level specified on the construction permit (File No.: BXPB-20141029ABA), or the main antenna at the power level authorized in the station license (File No.: BMLH-20130726AAJ).

Note that KZON-FM also exceeded FCC limits at multiple guy anchors for Tower 2, but KSLX-FM has been shown not to contribute 5% or greater of the FCC Public limit to the levels in these areas. KSLX-FM therefore has no responsibility for mitigation there.



## 2. SITE DESCRIPTION

Site ID: N/A			Site Name: KSLX-FM		
Date of Evaluation	April 28, 2015		Site Evaluator (name): Harry Young		
Site Type	Building		Tower/Monopole	XXX	Water Tower
Address: South Mountain Communications Compound, Phoenix, AZ					
GPS NAD83	N 33 19 53		W 112 03 47	Tower Height AGL	128m
Access Restricted	Yes				

This communications site is located on a transmitter tower in a communications compound. Access to the compound is restricted by the City of Phoenix and the service providers. Access to the tower is restricted to EME Awareness trained personnel, and an RF Safety plan is in place.

These are photographs of the KSLX-FM Tower site:





## 2. SITE DESCRIPTION (continued)

These are photographs of the KSLX-FM Tower site:





## 2. SITE DESCRIPTION (continued)

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## 2. SITE DESCRIPTION (continued)

These are photographs of KSLX-FM Tower site:



## 2. SITE DESCRIPTION (continued)

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## 2. SITE DESCRIPTION (continued)

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## 2. SITE DESCRIPTION (continued)

These are photographs of KSLX-FM Tower site:





## 2. SITE DESCRIPTION (continued)

These are photographs of KSLX-FM Tower site:



## 2. SITE DESCRIPTION (continued)

These are photographs of KSLX-FM Tower site:





## 2. SITE DESCRIPTION (continued)

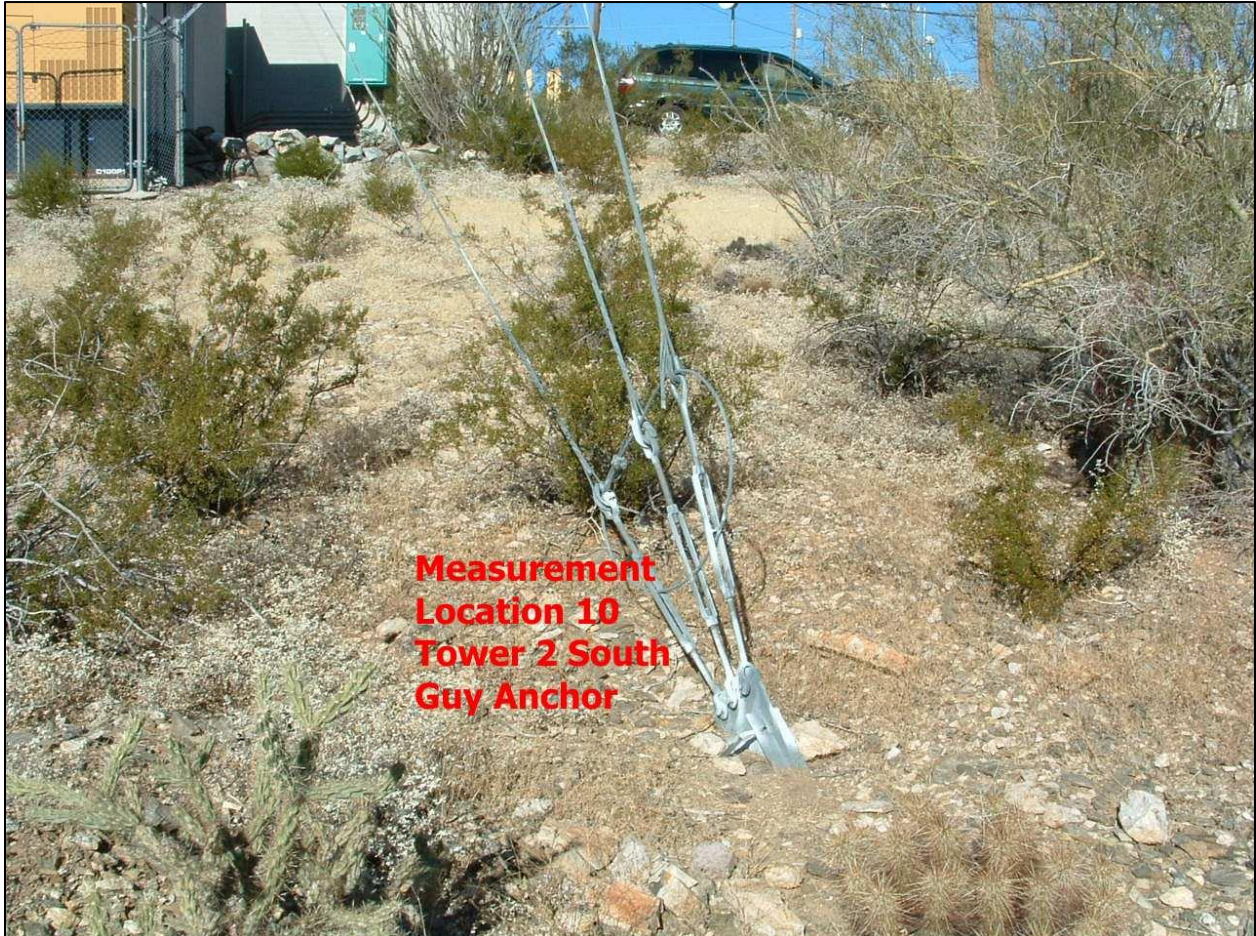
These are photographs of KSLX-FM Tower site:





## 2. SITE DESCRIPTION (continued)

These are photographs of KSLX-FM Tower site:





## 2. SITE DESCRIPTION (continued)

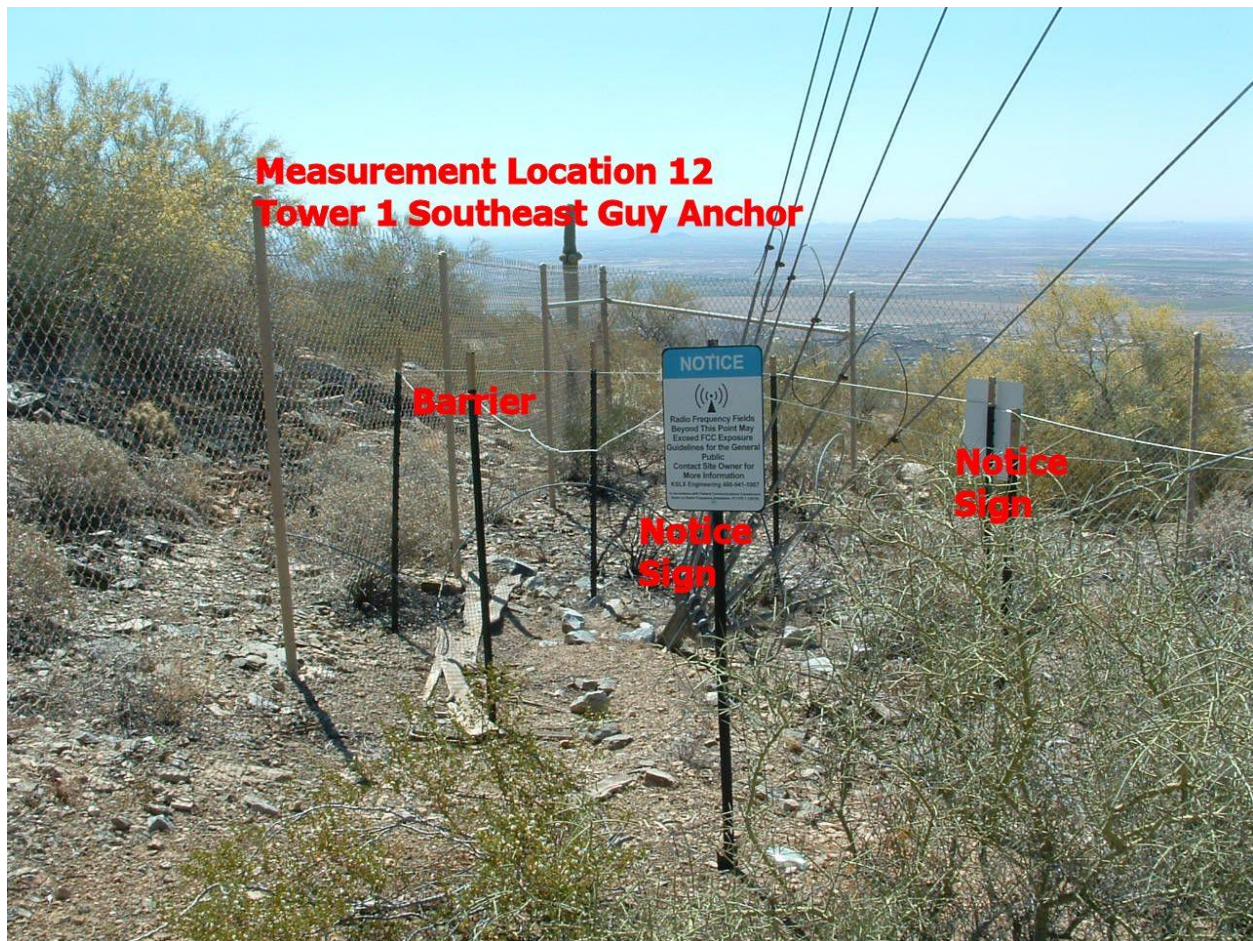
These are photographs of KSLX-FM Tower site:





## 2. SITE DESCRIPTION (continued)

These are photographs of KSLX-FM Tower site:



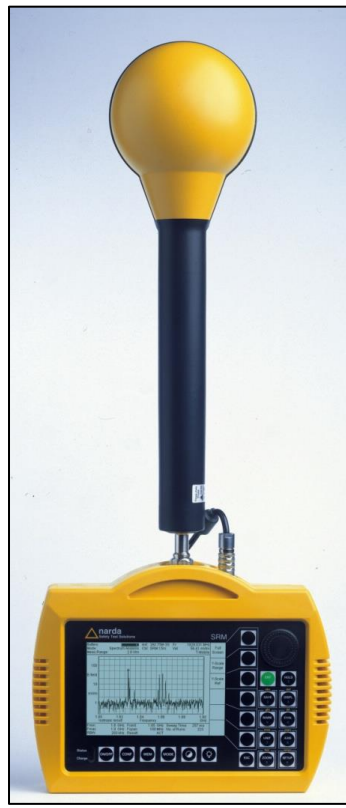
### 3. ANALYSIS

The field survey defines exclusion areas at the site. Electromagnetic energy (EME) fields were assessed through direct measurement at the transmitter site, using properly calibrated field probes.

An SRM-3000 Selective Measurement Device was used for the measurement phase of this survey. This meter represents the latest generation of equipment designed to measure RF energy by Narda Safety Test Solutions.

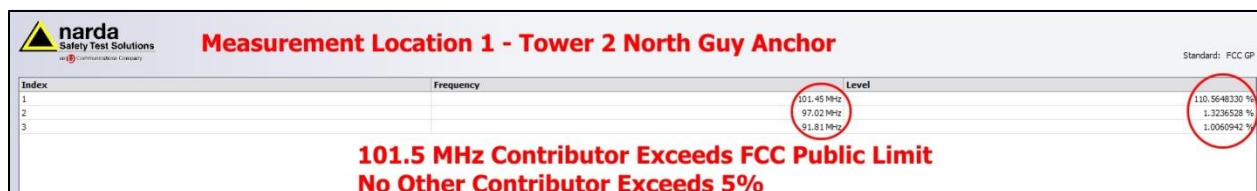
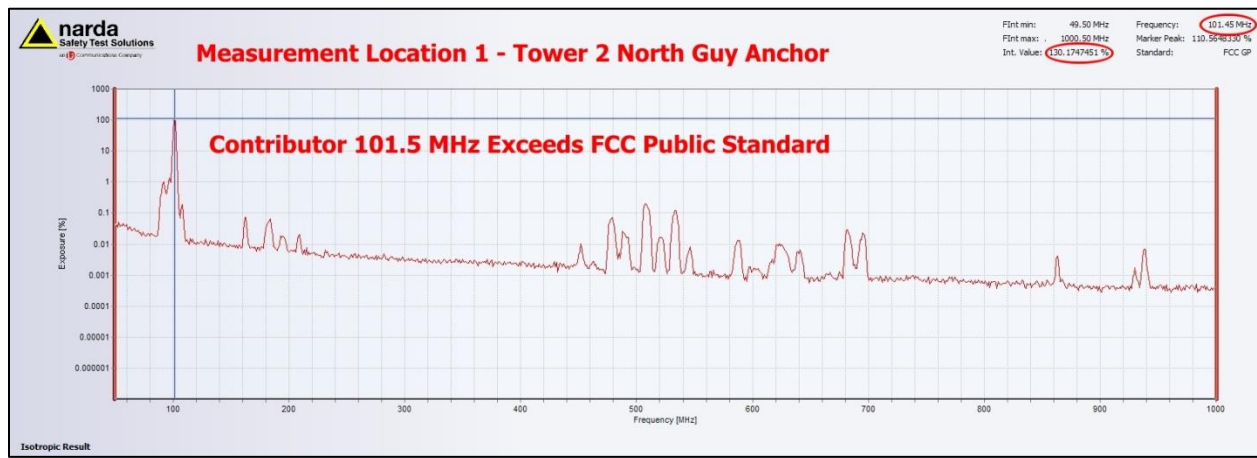
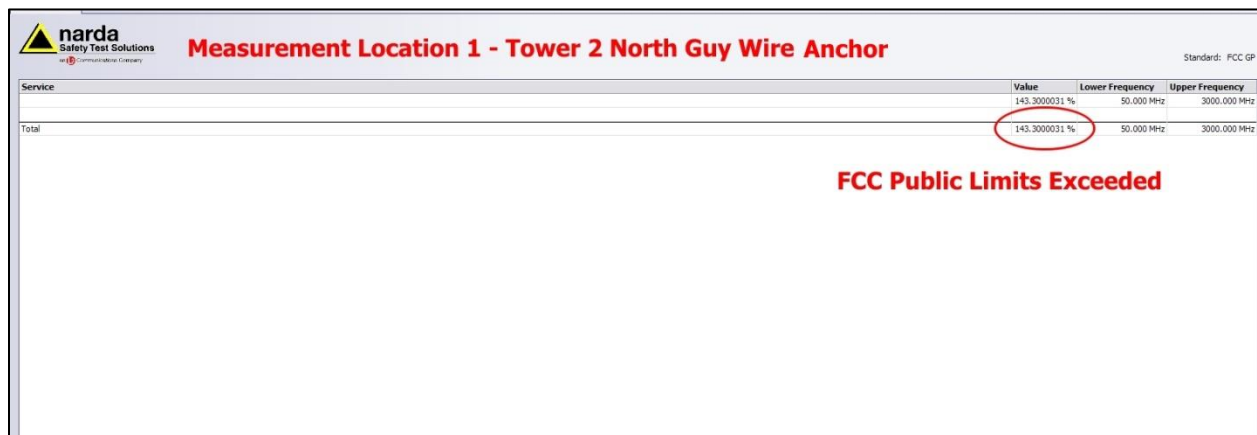
This device uses an isotropic antenna that is calibrated to measure Radio Frequency power densities using specific selectable frequencies. Charts representing the level of RF power measured at different locations at this site are listed in the FCC Public % of Standard.

#### **Narda SRM-3000**



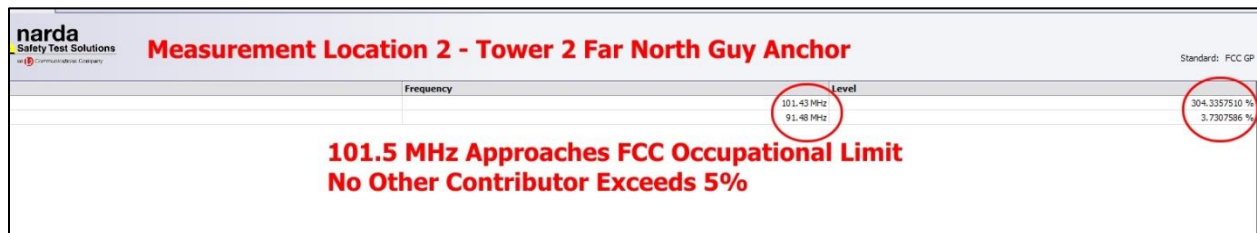
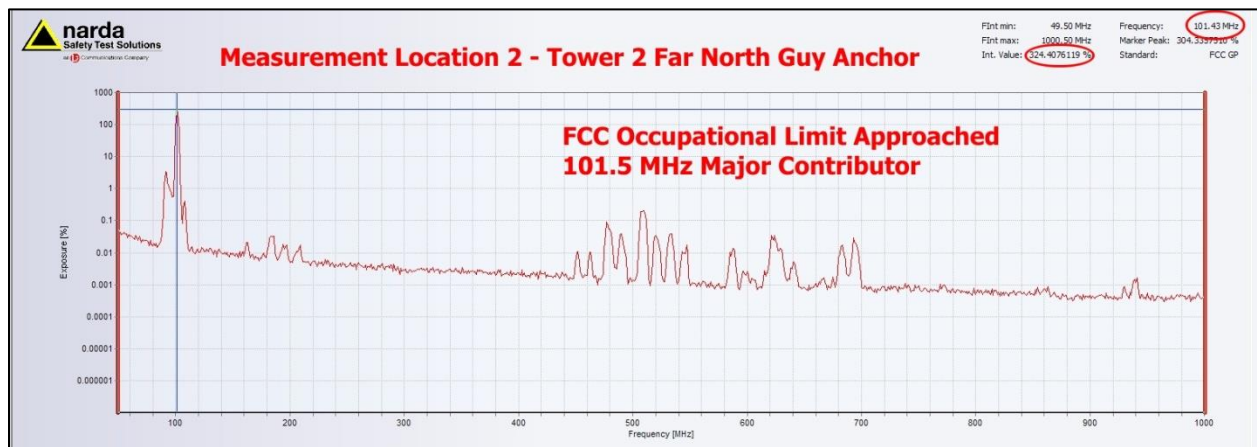
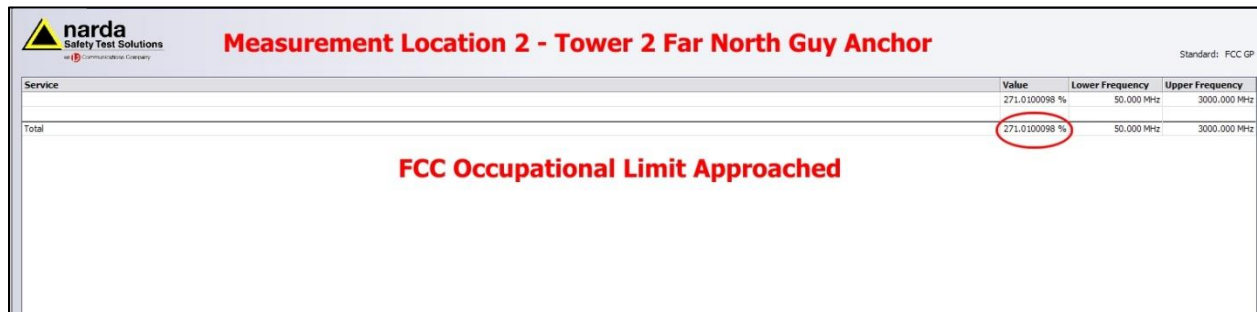
## 4. RESULTS

The spatial average RF Power density levels were measured at the locations described in the charts that follow. In the safety analysis charts, the measured levels are in percentage of FCC Public standards. In the spectrum chart, FInt min and FInt max define the frequency range being measured, with Int. Value indicating the total percentage of the FCC Public standard that levels reach. The blue x,y axis line intersection depicts the peak percentage level and frequency of the highest contributor, textually represented by Frequency and Marker Peak.

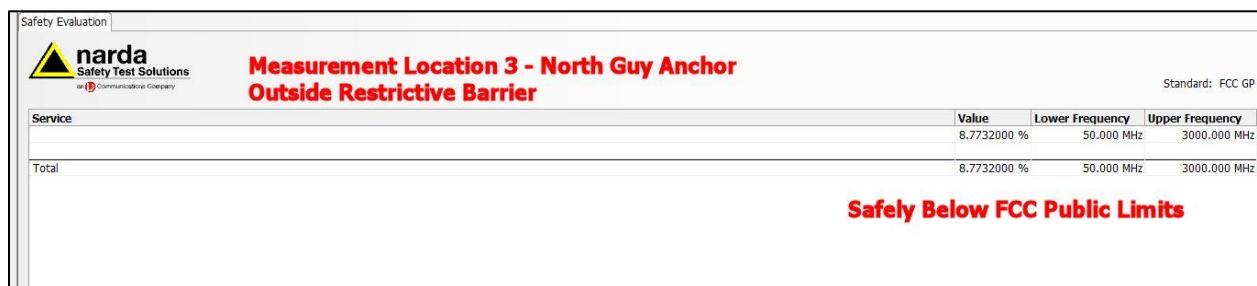
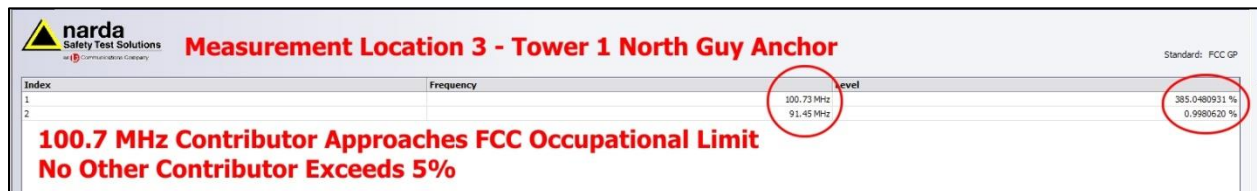
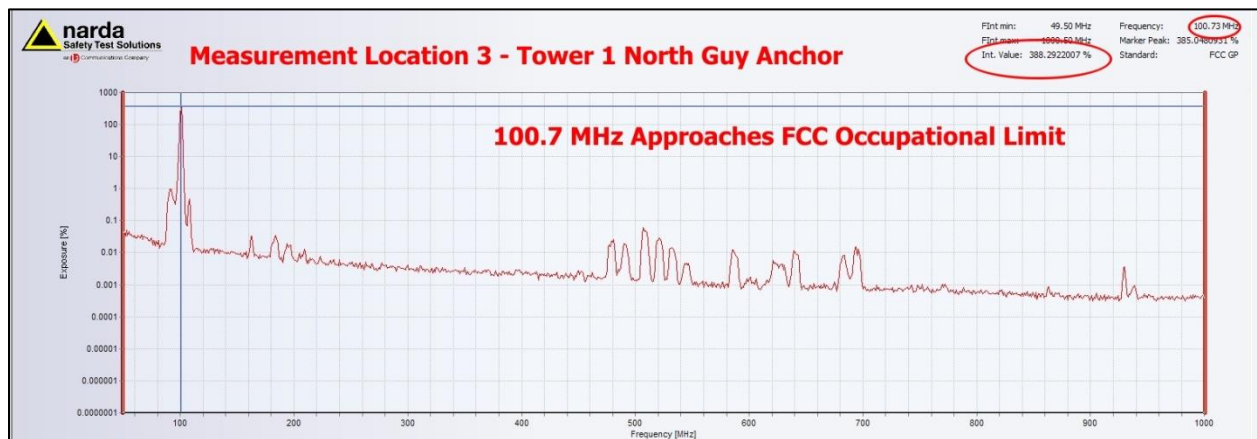
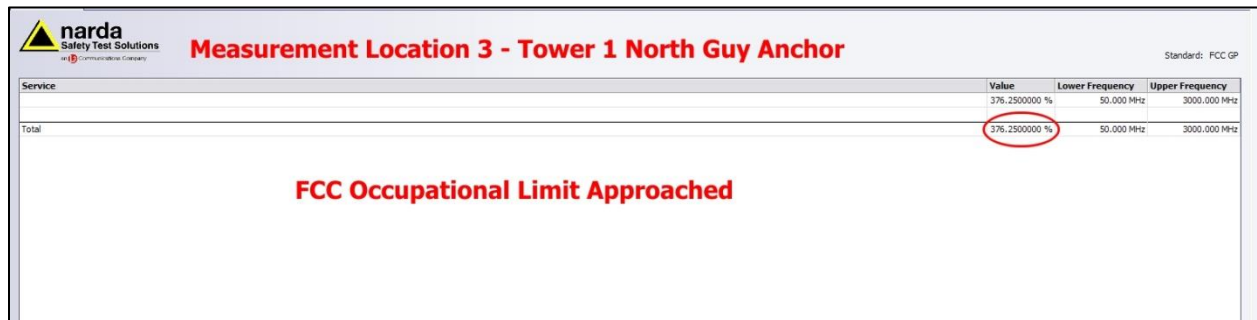




## 4. RESULTS (continued)





## 4. RESULTS (continued)







## 4. RESULTS (continued)


 <b>Measurement Location 4 - Main Gate</b> <span style="float: right;">Standard: FCC GP</span>			
Service	Value	Lower Frequency	Upper Frequency
	15.6359997 %	50.000 MHz	3000.000 MHz
Total	15.6359997 %	50.000 MHz	3000.000 MHz
<b>Below FCC Public Limits</b>			


 <b>Measurement Location 5 - Tower 1 West Guy Anchor</b> <span style="float: right;">Standard: FCC GP</span>			
Service	Value	Lower Frequency	Upper Frequency
	20.5849991 %	50.000 MHz	3000.000 MHz
Total	20.5849991 %	50.000 MHz	3000.000 MHz
<b>Below FCC Public Limits</b>			

 <b>Measurement Location 6 - Tower 2 West Guy Anchor</b> <span style="float: right;">Standard: FCC GP</span>			
Service	Value	Lower Frequency	Upper Frequency
	22.0970001 %	50.000 MHz	3000.000 MHz
Total	22.0970001 %	50.000 MHz	3000.000 MHz
<b>Below FCC Public Limits</b>			

 <b>Measurement Location 7 - Tower 2 Base</b> <span style="float: right;">Standard: FCC GP</span>			
Service	Value	Lower Frequency	Upper Frequency
	5.8123002 %	50.000 MHz	3000.000 MHz
Total	5.8123002 %	50.000 MHz	3000.000 MHz
<b>Below FCC Public Limits</b>			

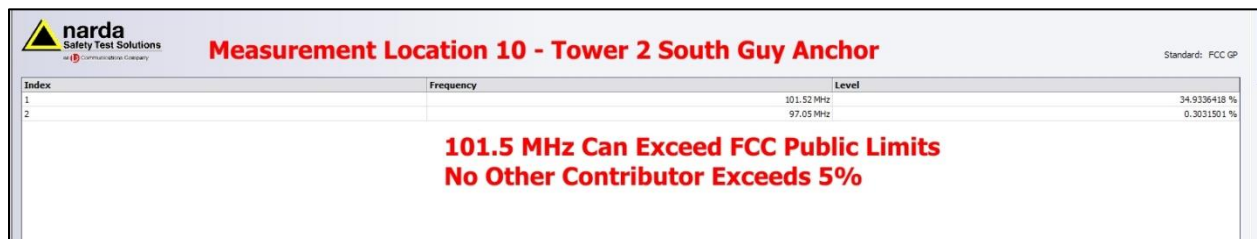
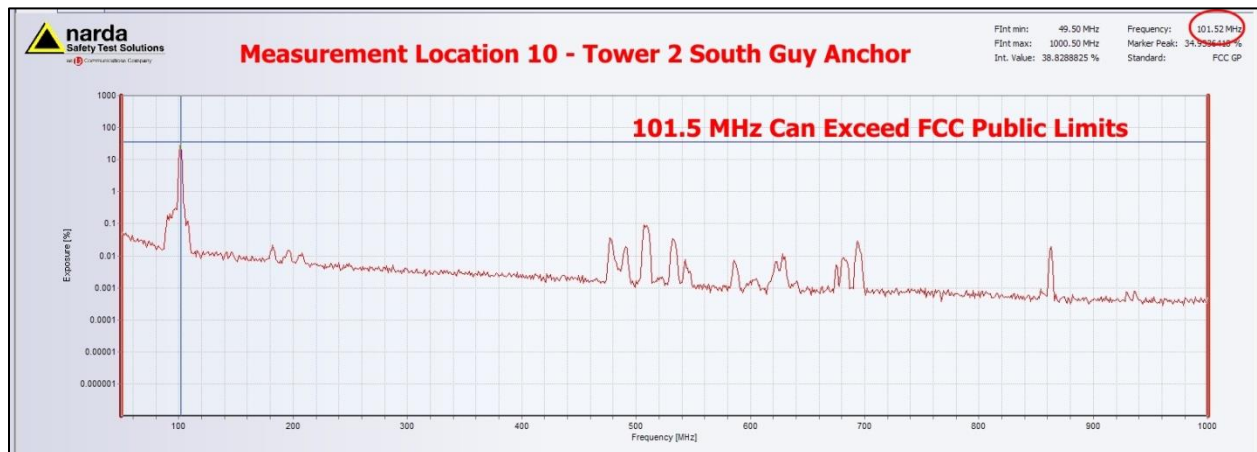
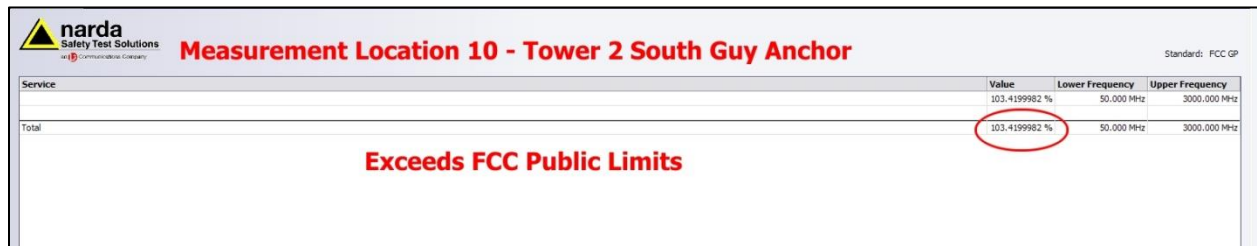
## 4. RESULTS (continued)

 <b>Measurement Location 8 - Tower 1 Waveguide</b> <span style="float: right;">Standard: FCC GP</span>			
Service	Value	Lower Frequency	Upper Frequency
	11.7390003 %	50.000 MHz	3000.000 MHz
Total	11.7390003 %	50.000 MHz	3000.000 MHz
<b>Below FCC Public Limits</b>			

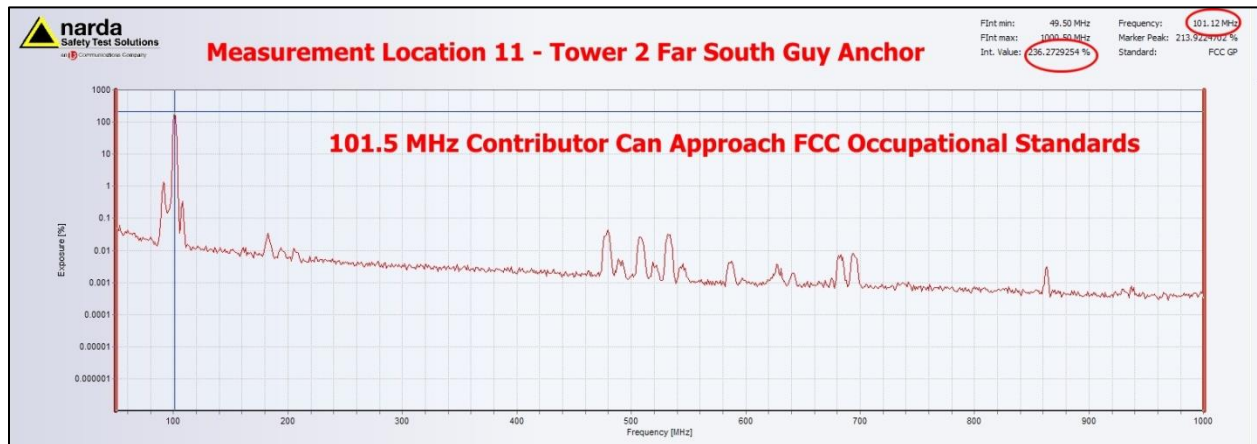
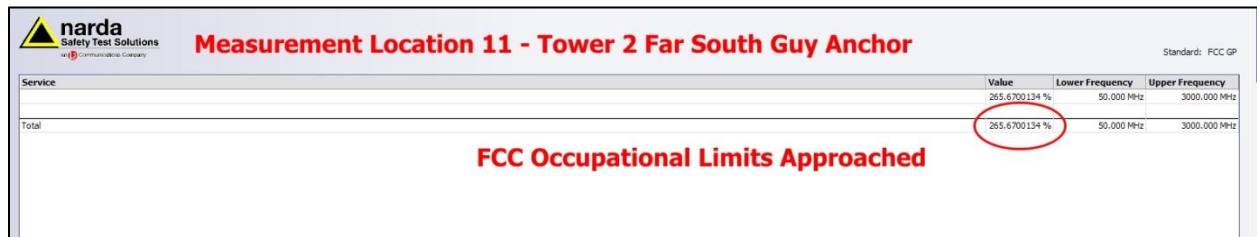
 <b>Measurement Location 9 - Tower 1 Base</b> <span style="float: right;">Standard: FCC GP</span>			
Service	Value	Lower Frequency	Upper Frequency
	6.9587998 %	50.000 MHz	3000.000 MHz
Total	6.9587998 %	50.000 MHz	3000.000 MHz
<b>Below FCC Public Limits</b>			



## 4. RESULTS (continued)

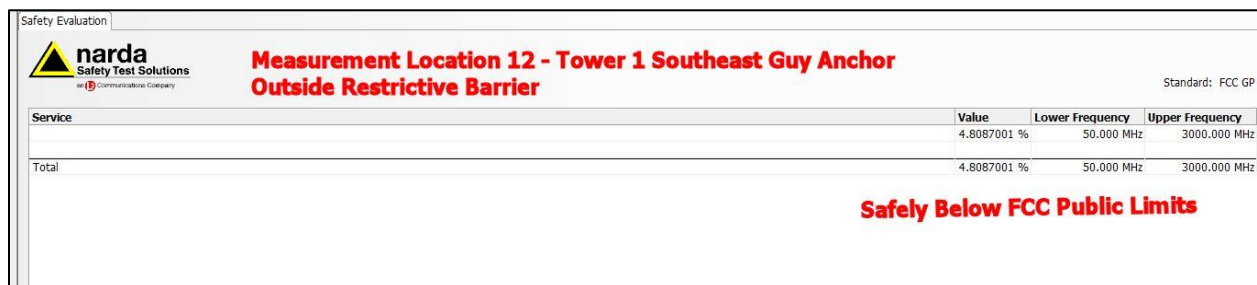
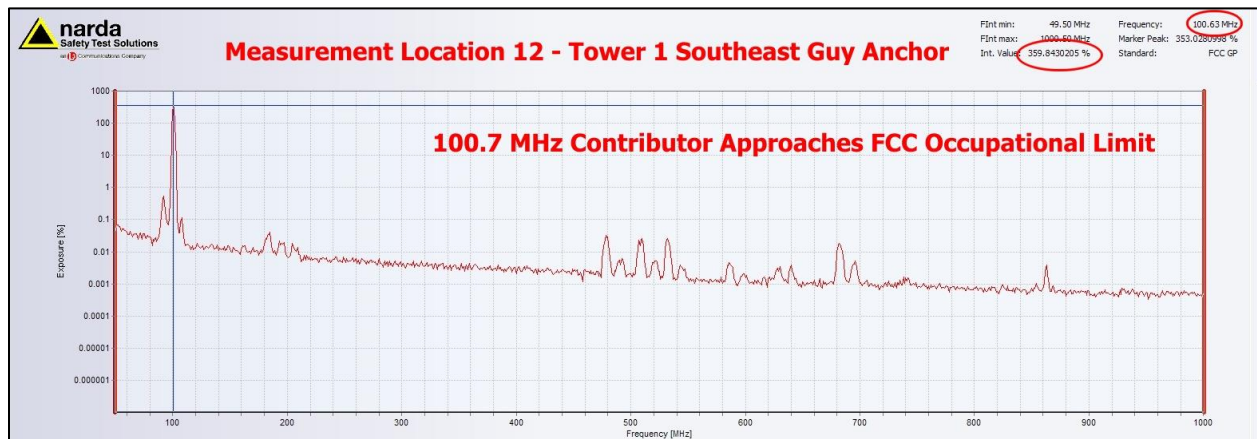
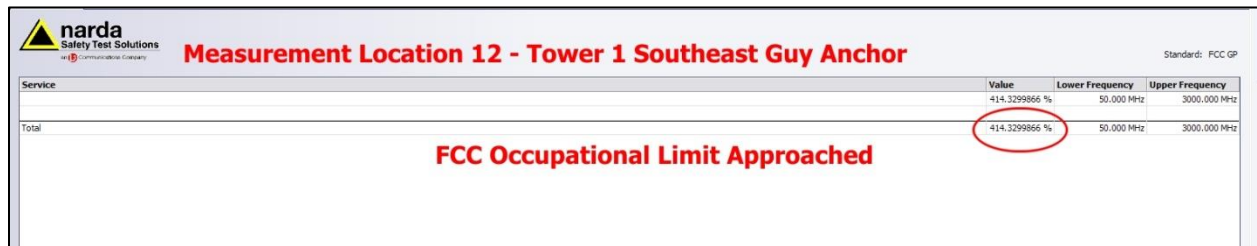


## 4. RESULTS (continued)





## 4. RESULTS (continued)



## **5. RECOMMENDATIONS**

With the installation of the barriers and signs at the north and southeast guy anchor locations, KSLX-FM is compliant with FCC Guidelines at this site. In order to maintain compliance, these barriers and signage must remain intact.

KSLX-FM (Hubbard Radio Phoenix, LLC) must ensure tower antenna access will be restricted to personnel that have been authorized by KSLX-FM (EME Awareness trained personnel only). This would include all maintenance personnel and contractors accessing the tower antennas.



# APPENDIX A- LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

(REFERENCE= TABLE 1. Title 47 CFR)

## (A) Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f <sup>2</sup> )*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

## (B) Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f <sup>2</sup> )*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz\*Plane-wave equivalent power density

NOTE 1: **Occupational/controlled** limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2: **General population/uncontrolled** exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.