

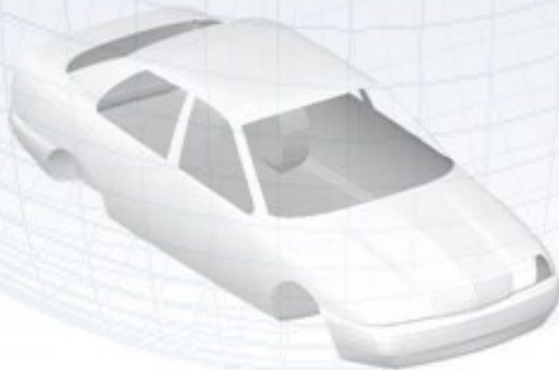


ITU

“Workshop on Human Exposure to Electromagnetic Fields”

Base Station Compliance

Marnus van Wyk
EMSS Consulting, South Africa



Turin, Italy
9 May 2013

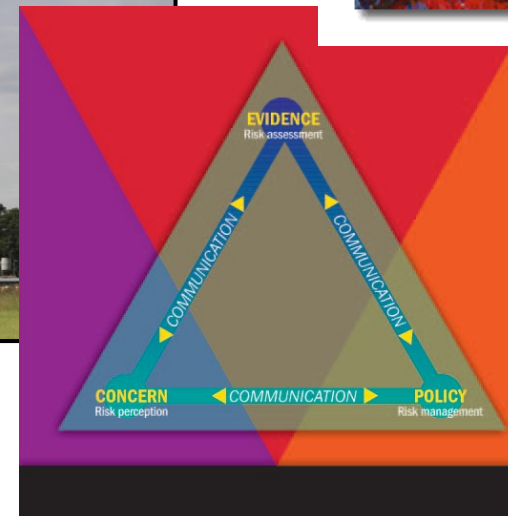
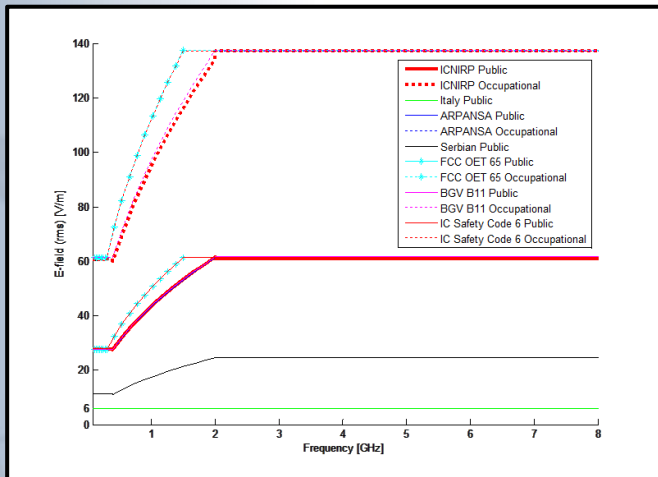
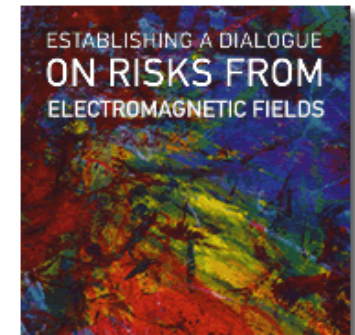
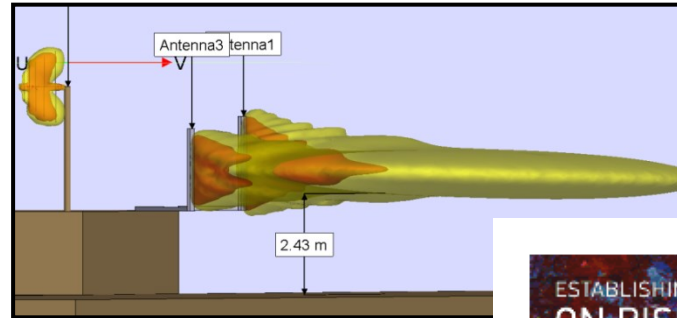


- **Introduction**
- **Base station compliance**
 - Does base station comply with relevant standard?
- **EMF Measurements in public areas**
 - Public risk perception
- **Summary**

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Introduction

- Various standards / guidelines (ICNIRP, Italy)
- Apply to base stations
- Balance effort with risk
- Risk communication / public perception

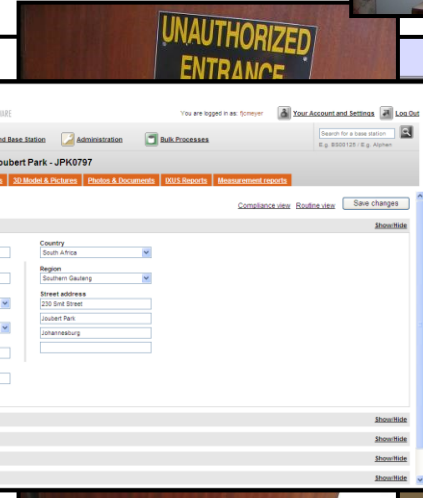
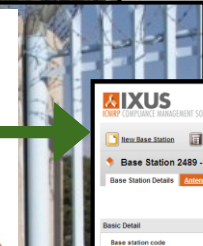
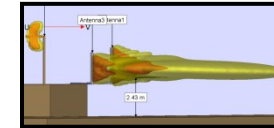


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Base station compliance

Steps

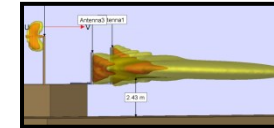
- Determine “exclusion zone” (IEC 62232)
- Assess zone accessibility
- Ensure sufficient safety measures in place (access control, signs, training, etc)
- Certification



Base station compliance

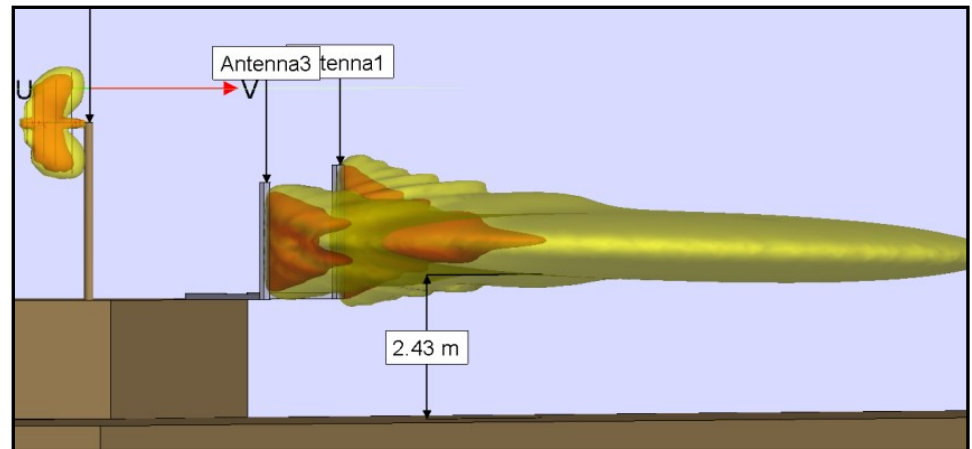
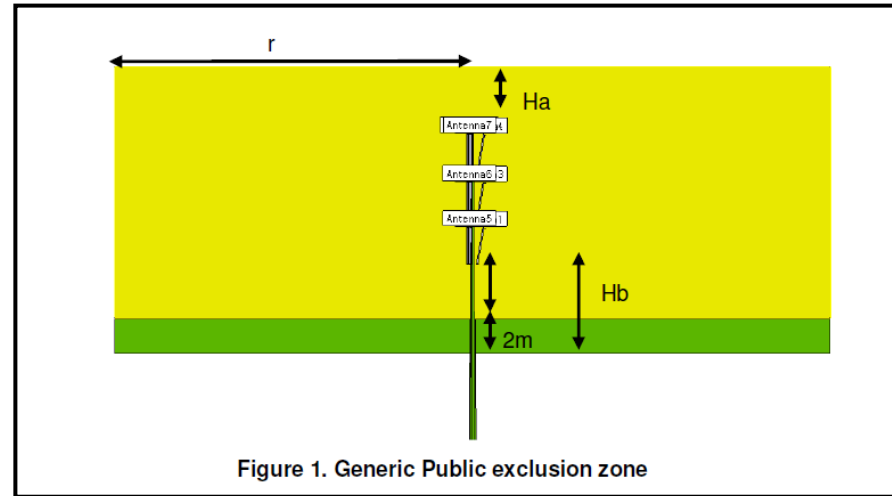
Steps

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Exclusion zone and accessibility

- Where are the exclusion zones and how accessible are these zones?
- Techniques
 - Generic rules
 - Computer simulation
 - Measurement



Exclusion zone and accessibility

- **Generic rules**

- Efficiently process many sites where zones are not easily accessible

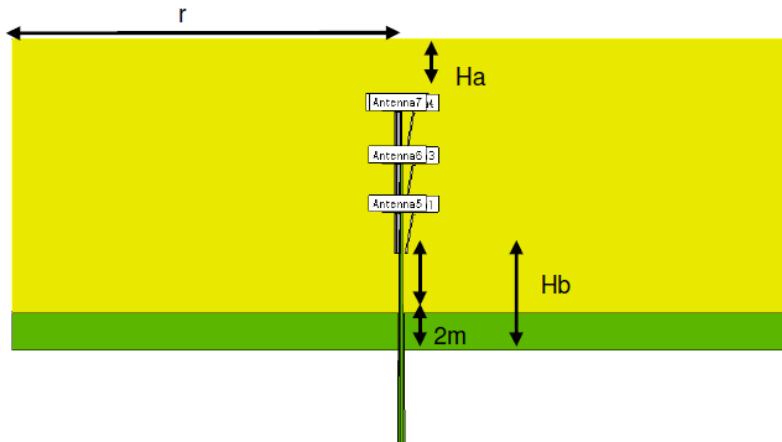
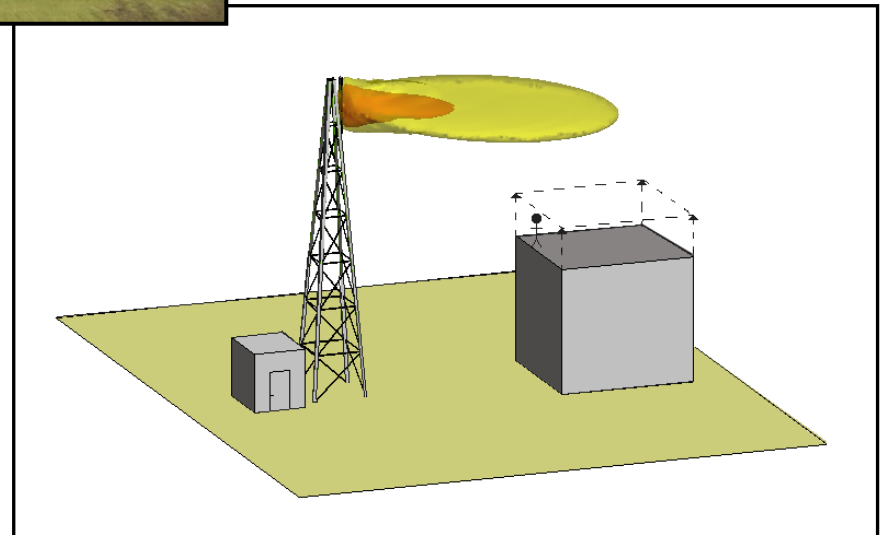
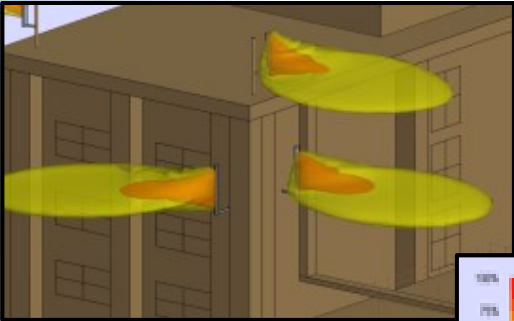
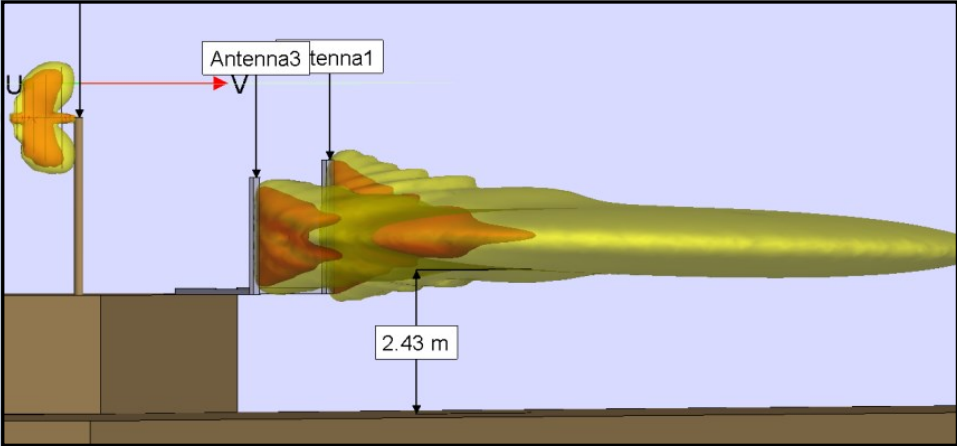


Figure 1. Generic Public exclusion zone



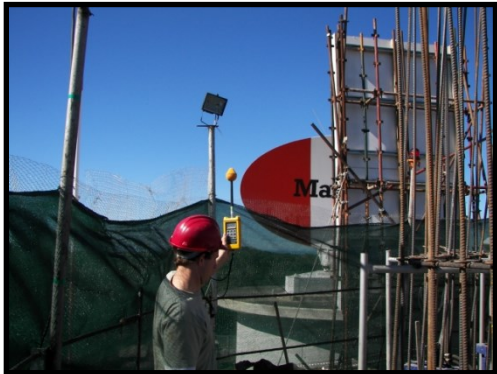
Exclusion zone and accessibility

- Computer simulation



Exclusion zone and accessibility

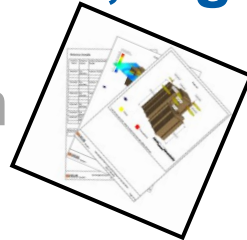
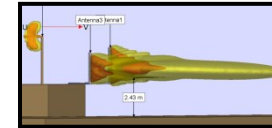
- Measurement



Base station compliance

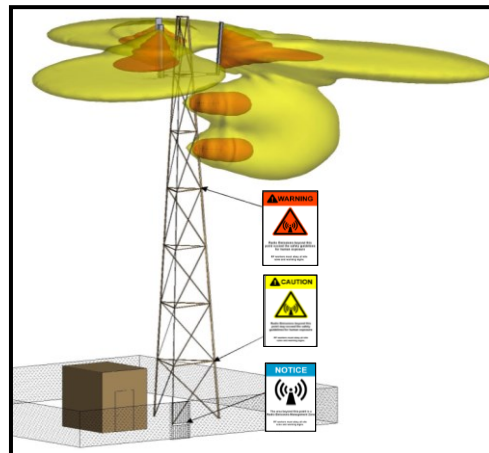
Steps

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- Certification



Safety measures

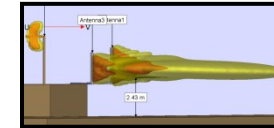
- Access control
- Signage



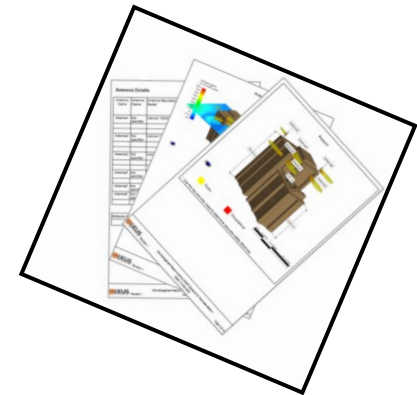
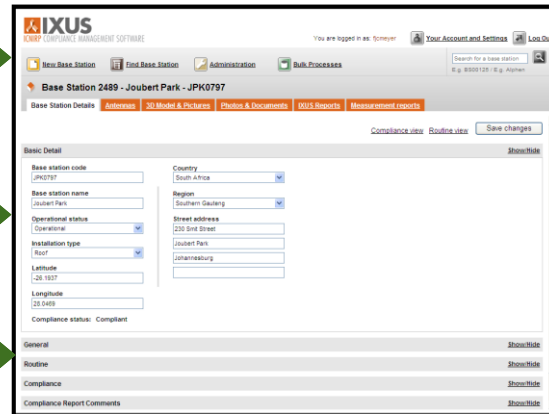
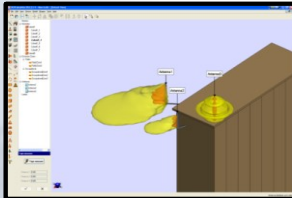
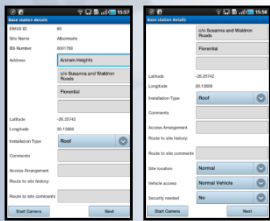
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Certification



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EMF Measurements

- Why measure EMF levels in public areas around cellular base stations?
 - Public concern
 - Normally well outside the exclusion zone

RONDEBOSCH DEBATE

School heads mixed over cellphone mast plan

DOMINIQUE HERMAN

The proposal to build a mobile phone mast at Rondebosch Boys' Preparatory School is expected to be approved in the next few weeks, but school officials are mixed over the plan.

MTN cellular base stations at nearby St. Thomas's Church until there is "clear scientific proof" that the mast is safe.

They have not received any information from the South African Council on Radiation Sources, and they had not received any information from the Health Dept. or the Department of Health, which the school principal, Conrad Steyn, said he had asked the head of the biology department to investigate the mast and provide a statement by the end of the month.

In mid-May, the school had been asked to erect a mast on its premises and there was a similar request at last year's school in Somerset West about three years ago - but which was rejected.

"It's far more dangerous to cross the street, than what you get there. It's going to be damaging to you," he said.

Herbert Pollack, the principal of Rondebosch Prep, said that he had not yet formed an opinion on the mast

yet, but he had not studied the health issues. "I approved one mast in the area, but I don't know if it is a health risk," he said.

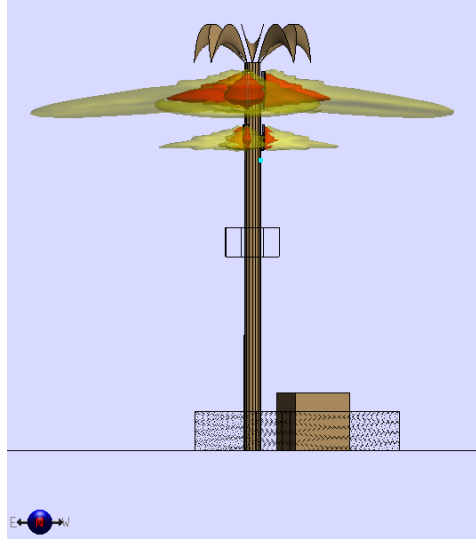
The mast is about 10m tall and would be sited about 100m from the school's main building. It would be sited on the roof of a building that is used for storage.

Steyn said that he had received many letters from parents, some of which were very angry. Some parents had received letters from the Health Dept. and the Department of Health, which the school principal, Conrad Steyn, said he had asked the head of the biology department to investigate the mast and provide a statement by the end of the month.

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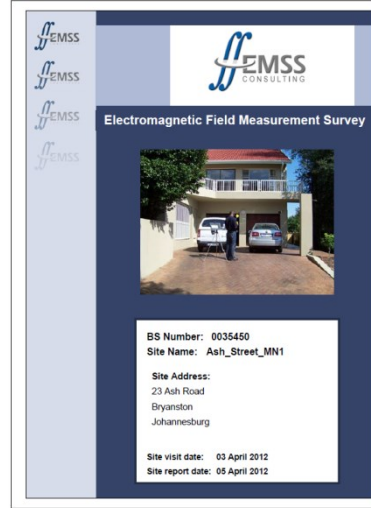
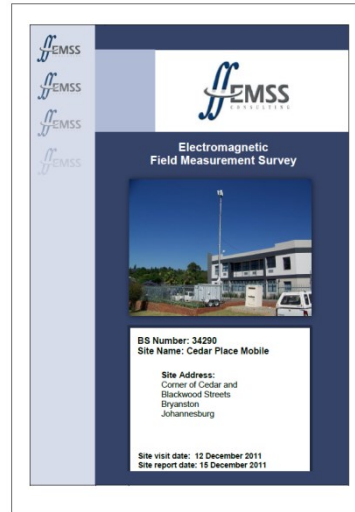
EMF Measurements

- Use Narda portable spectrum analyzer
- Follow established measurement procedure (IEC 62232, CENELEC, etc)
- Positions
 - Publicly accessible positions
 - Points of local maximum exposure
 - Points of specific interest
 - Typically 6-10 points per site



EMF Measurements

- Automated



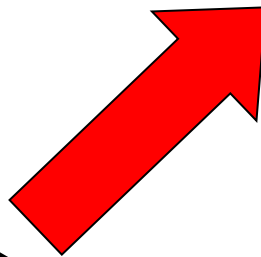
Measured Results

Table 1 and Figure 1 presents the measurement positions and exposure levels in terms of a percentage of the ICNIRP guidelines, where a 100% value would indicate that the safe exposure limit for the General Public has been reached. The Vodacom contribution to the total exposure is given in the last column of the table. Since the aim of the survey was to measure the typical exposure values, the reported results are un-extrapolated peak field instantaneous exposure results, at the specific date and time of the measurement survey.

Table 1: RF Exposure Levels at Measurement Positions

Measured On	No.	Position	Total Exposure	Vodacom Exposure
03/04/2012 14:22	1	In front of the garage of 23 Ash Road	0.0564%	0.0286%
03/04/2012 14:26	2	Upstairs, at the coffee table, next to the main bedroom	0.0460%	0.0149%
03/04/2012 14:32	3	Upstairs, next to the bathroom door, in the main bedroom	0.1000%	0.0670%
03/04/2012 14:35	4	Ground level, at the table, opposite the gym	0.0335%	0.0024%
03/04/2012 14:38	5	Ground level, inside the dining-room	0.0339%	0.0015%
03/04/2012 14:41	6	Ground level, inside the office	0.0385%	0.0071%
03/04/2012 14:44	7	Ground level, inside room containing military equipment	0.0262%	0.0010%
03/04/2012 14:47	8	Ground level, inside the gym	0.0211%	0.0006%

EMF Survey Report - Ash_Street_MN1
Valid as of 05 April 2012



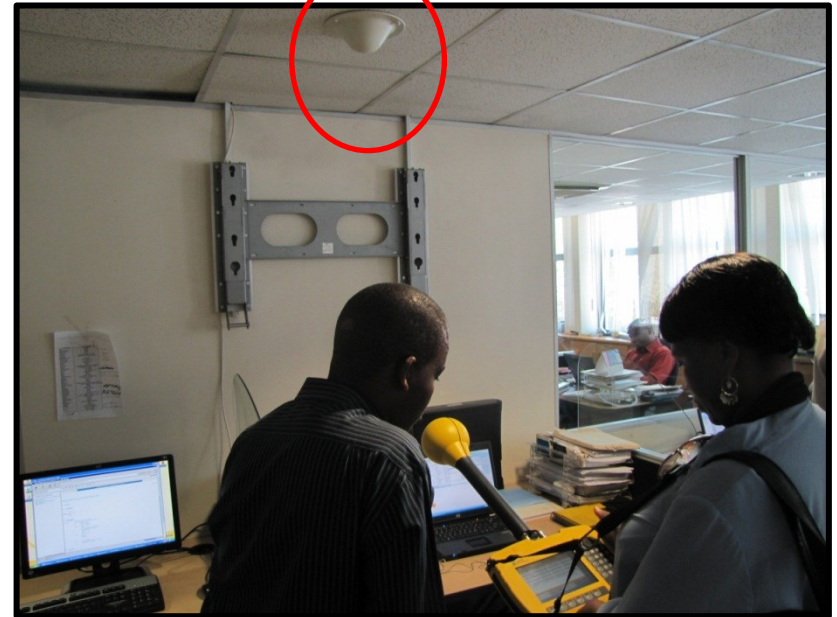
EMF Measurements

- Some positions

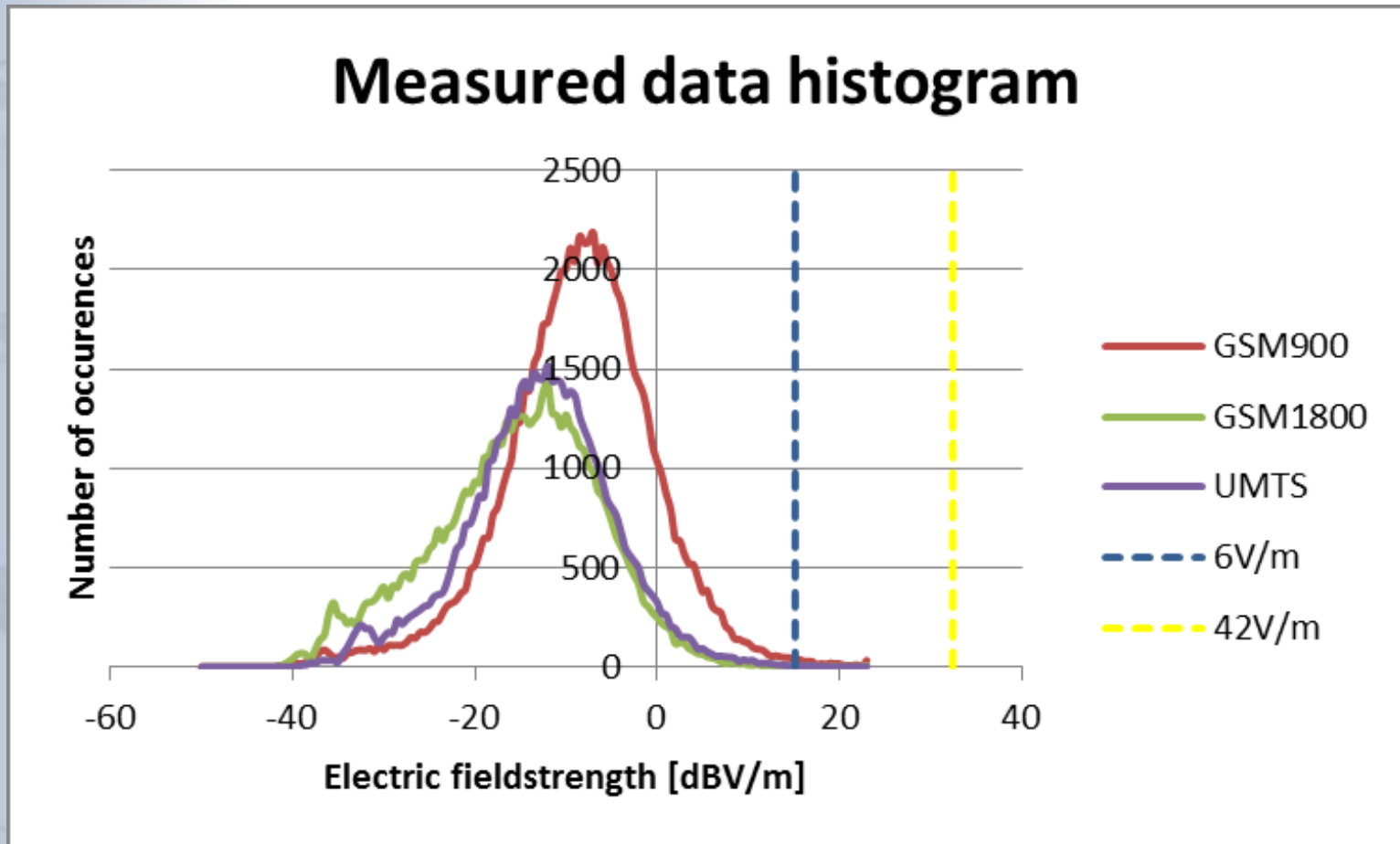


EMF Measurements

- Some positions



- Results (77 000 measurements)



Longer duration measurements

- Spectrum analyzer spot measurements preferred



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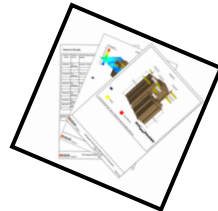
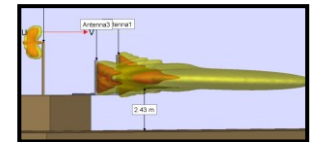
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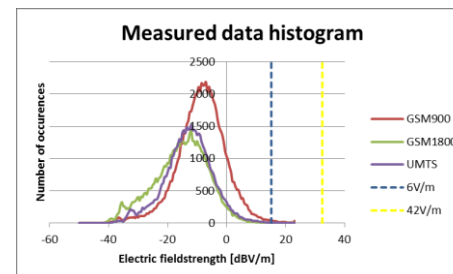
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- **EMF Measurements in public areas**

- Public risk perception



- Thank you

- Questions?

mvanwyk@emss.co.za

