

# UK GTEM User Group

## Minutes of the meeting held at Nokia on 19th February 2003

### 1. Present

Roger Dixon (RD)	IFR Ltd [Chairman]
Ian Alderman (IA)	Secretary
Harbinder Bharj (HB)	BRE Secretary
Phil Carter	Consultant
Michael Davies	Measurement Technology Ltd
Howard Chetwin	Measurement Technology Ltd
Daniel Griffin	BSI
Andy Perkins	Schaffner
Tim Hague	EMV
PM	Nokia
Neil Coote	Nokia
John Wombwell	EMC Hire
Joe Wilkinson	University of Paisley
Martin Alexander	NPL
Richard Neyton	Apollo
Dennis Burns	MCI

### 2. Apologies received

Stephen Lee	Mariner systems
Prof Andy Marvin	York Uni
John Birkett	Consultant
Farquahar Galbraith	University of Paisley
Kevin Kumar	OFGEM
Stuart Bright	Ampy Automation
Graham Blissett	AWE
Tim Williams	ELMAC
Eddie Veater (EV)	UKAS
Phil Mantle	Ascom Telecomm
Jon Jones	Ascom Telecomm

### 3. Chairman opens meeting

The Chairman (RD) opened the meeting and welcomed all attending members.

### 4. Minutes Of The Last Meeting

The minutes of the last meeting were accepted without comment

### 5. Discussion with invited Guest Phil Carter

The chairman welcomed Phil Carter to the meeting and introduced this session as a question and answer particularly focussing on the pros and cons of using the GTEM cell in practice and how this relates to achieving UKAS accreditation.

A beneficial discussion went into these Questions in some depth. The first ones were relating to Immunity testing: These are a few brief notes from the secretary - members may wish to fine tune them at the next meeting!

Q1 If you have a small EUT, is a 1 point calibration adequate?

Ans. Not if the standard says a minimum of 4. Accreditation must follow the standard even though the spirit may suggest that only 1 point may be necessary. You can use the cell if it meets the requirements. The EMC directive has a draft change which suggests that the manufacturer must carry out the measurements to standards more correctly than any interpretation the user may consider appropriate – this may be a burden!

Q2 If you have a small EUT with cables can you use more points to characterise the area of the cell that is illuminating the cables, and not be stuck with a larger symmetrical grid as per the standard?

Ans. You must carry out the calibration according to the rules otherwise you would have to declare a deviation. 0.5M grid is the smallest specified by EN61000-4-3. However this is a question for the Cenelec committee to consider.

Q3 To achieve 30V/m in a 950 cell I put the EUT half way along the cell - how close can the EUT be to the septum?

Ans. Same rules apply 1/3 of septum height

Q4 Is it ever necessary to do a 16 point cal in a cell - too many points? waste of time?

Ans. Yes in a large cell but use the reduced number in a small cell and declare this.

Q5 The results between screened rooms and GTEMs sometimes don't correlate because the field control tolerance is not the same. Should there be a 'standard' tolerance during calibration?

Ans. This is a question of determining the uncertainty of the two systems and is not easy due to the uniformity and linearity of the probe. However this does not need to be recorded in the report.

Q6 Should there be a limit on field surges during levelling?

Ans. Yes, but this is not in the standard, but users must be aware and UKAS requires it to be checked and minimised. Suggest leave modulation on or level on – correct to cal level by ramping carefully to new level.

Mod kits are available for R & S and Agilent Generators

Q7 Is there a test for field probe coupling - does the correction factor change as it nears floor or septum?

Ans. We don't know – a question for NPL perhaps

Q8 Now that EN61000-4-20 is published by the IEC can it be used for testing in conjunction with EN61000-4-3 or instead of it?

Ans. Re-assessment will be required which may require a visit.

Q9. When will EN61000-4-20 be harmonised? Does it need to be to use it = basic standard?

Ans. Use can be made of it in a TCF but otherwise must wait for Product Specific Standard.

Q10. EN61000-4-20 seems a much more rigorous test for the GTEM Cell than –4-3 is for a screened room. Experience suggests screened rooms have significant field variations in the 'Z' axis!

Ans. The answer lies in the dogma of the Standards not in the reality of the technology - the GTEM is a very useful device used within the established limits.

Q11, 12. If we have no accreditation at all what is the process for achieving it for immunity and emissions? What is the value of accreditation?

Ans. Immunity OK but UKAS can only accredit a test procedure for emissions which is defined by a manufacturer perhaps, and also training and qualification of the tester can be accredited. But there are no hitherto published Standards for GTEM's which emissions can be accredited to.

CISPR have indicated that they were willing to produce/support a method of emissions testing in a GTEM but it is then up to the product committees to then adopt this procedure.

FCC have a ruling which says if you can demonstrate a particular EUT correlates between OATS and GTEM then you can continue to use the GTEM for emissions measurements.

Q13. The GTEM has a major advantage over an OATS in eliminating ambient signals yet OATS remains the standard method despite increasing background signal levels?

Ans. Yes, but again it is time for committees to adopt the GTEM to take advantage of this.

Other general questions

Q14. Reciprocity of the frequency characteristic in GTEMS. Why does the emissions software for computing the response characteristic not make use of the field calibration curve for the cell? The answer is that this is due largely to how measurements have evolved for the cell. However some software packages (eg., Electrometrics) do allow the user to incorporate the frequency response profile in the emissions measurements.

Q15. Howard Chetwin showed the group the frequency response of MTL's GTEM and in particular commented on the poor flatness of the response. Comments from the meeting indicated that the cell should be much better than it appeared to be. The launch connector has been found to be crucial in achieving a good match and a flatter response. MTL were advised to get the cell looked at with a view to getting improvements made.

## **6. EN61000-4-20**

The chairman mentioned that Markus Heidemann wants us to send him our thoughts on 61000-4-20 now that it has passed its final vote.

Annex B Note B.1 b)

Decide to ask Angle Nothofer to check out this issue in relation to the paper(s) produced by J.P.Kaerst [25,26] and if okay we suggest the statement remains in place.

## **7. Update from NPL**

Martin Alexander gave an update about the round robin results from York/NPL/EMC Hire. In the round robin comparison carried by both York EMC and NPL it was

observed that the NPL results were generally +8dB above YES. John Wombwell also carried out the measurement at EMC Hire which came out surprisingly in between the York and NPL measurements. So Martin concluded that the GTEM measurements have a spread of up to 8dB (or  $\pm 4$ dB). Cell sizes: NPL = 1750, YES = 5311, EMC Hire also 5311.

Other comments – If the EUT has a strongly polarised emission profile then the correlation to OATS is reasonable. However if the EUT has more complex directional emissions then the OATS would only pick up the signal in the polarisation of the antenna but the GTEM will pick up signals in all planes and the correlation will not be so good.

Ground plane measurements don't seem to be a natural environment for most products where as a FAR measurement is cleaner and the ground bounce can be ignored.

## **8. Experiments and observations with IFR's GTEM1750**

Roger Dixon reported on observations made when looking for anything that might influence on the 'y' axis E field. The turntable had a considerable effect over the 500MHz to 1GHz range where variations up to +27% and -33% were observed surprisingly demonstrating the effects of 'insulating' materials.

RD also discussed the results of using 75 ferrite tiles on the floor of the cell under the EUT area, an idea previously introduced to the group by Ben Loader of NPL. The ratio Z/Y reaches 115% at 128MHz without the tiles and reduces to 55% with the tiles in place. However over the whole frequency range the tiles have made some frequencies worse. The standard requires a maximum of 3% of test frequencies are <2dB below the primary E field component and the rest <6dB. One other effect of the tiles is that the cell becomes more efficient requiring less power to create the required field.

## **9. The Best Practice Guide & Timetable.**

Publication is expected by the end of March. The group as asked to contact Angela Nothofer asap with any contributions to be considered for inclusion.

## **10. Exchange Of Information About Anything**

- Note from Alan Hutley about the use of the GTEM User Group Web Site. Do we have any articles? What are we going to use the web site for? Review at next meeting
- BSI moving the EMC department to Maylands Avenue and closing their Finway site. Therefore the BSI GTEM1750 is available to a good home!
- Correlation of emissions between OATS and GTEM achieved up to 4GHz - target was 13GHz.

## **11. Date of the next meetings**

The next two dates were chosen as 24<sup>th</sup> June (venue tbc) and 28<sup>th</sup> October (venue Schaffner at Wokingham) courtesy of Andy Perkins.

Post Meeting Note: The meeting on June 24th will be at MTL in Luton not at NPL Teddington. Details to be sent two weeks before meeting - note the date

## **12 Close**