# VCCI DAYORI

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## Contents

Contribution: My Research Activities Masanori Ishii ····· 1
Committee Activities ····· 4
● Board of Directors ····· 4
● Board of Councillors ····· 4
● Steering Committee ····· 5
● Technical Subcommittee ····· 6
● International Relations Subcommittee ····· 7
● Market Sampling Test Subcommittee ····· 8
● Education Subcommittee ····· 9
● Public Relations Subcommittee ····· 10
● Measurement Facility Registration Committee ····· 11
● Report on Committee Activities: List of Acronyms ····· 12
14th instalment
Structure of the IEC 61000 Series of EMC Standards Made by TC77
Masamitsu Tokuda ··· 14
Report on the 2018 Joint IEEE EMC & APEMC Symposium ····· 18
Participation Report on the FY 2018 Monthly VCCI Seminar for Information and Communications ····· 22
Report on COMPUTEX TAIPEI 2018 ····· 24
Report on the FY 2017 Business Report Meeting ····· 29
Report on the VCCI Seminar ····· 34
Status of FY 2018 Market Sampling Tests ····· 35
Secretariat Dayori ····· 36
● VCCI Membership Registry (May - July 2018) ····· 36
● VCCI Schedule for FY 2018 ····· 37
● Status of Compliance Test Notifications (V-2 + VCCI 32-1) ····· 38
● Status of Compliance Test Notifications (VCCI 32-1) ····· 39
● Registration Status of Measurement and Other Facilities ····· 40

Contribution

# My Research Activities

Masanori Ishii

I am Masanori Ishii of the National Institute of Advanced Industrial Science and Technology. Since last year, I have been serving on the VCCI Measurement Facility Registration Committee, and from this year, I will be replacing Koji Komiyama as a member of the VLAC Accreditation Committee. As I am new to the committee, I would like to start with a self-introduction and some background on my research activities.

**My student years**

As a student, I attended the University of Electro-Communications, studying various subjects including anntenas, measurement, and EMC. For six years, I studied under Prof. Emeritus Takashi Iwasaki in each stage of my education from Bachelor's, Master's, to Doctorate. Prof. Emeritus Takashi Iwasaki also served on the aforementioned committee until around the year 2000. During my graduate days, the topic of my research was "estimation of arrival direction of an electromagnetic pulse by the waveform reconstruction". I researched a method of estimating the arrival direction of electomagnetic waves based on the brand new concept of using complex antenna factors and waveform reconstruction technique. At the time, a contributor to an earlier issue of this magazine (VCCI Dayori NO.129 2018.7), Prof. Shinobu Ishigami, was even working as an assistant at the laboratory. Prof. Ishigami's instruction focused on waveform measurement and waveform reconstruction technique for electromagnetic radiation.

In March 2002, I completed my doctoral program at the Graduate School of Electro-Communications at the University of Electro-Communications, and in April that same year, I joined what was then the independent administrative agency "National Institute of Advanced Industrial Science and Technology" (now a national research and development agency, hereafter "AIST"). This required me to move to Tsukuba City, Ibaraki Prefecture. However, this was before the opening of the Tsukuba Express, which connects areas to the inner city by a major traffic network, so Tsukuba was an isolated region. For someone like me who was born and raised in urban Tokyo, I remember how inconvenient life felt all of a sudden.

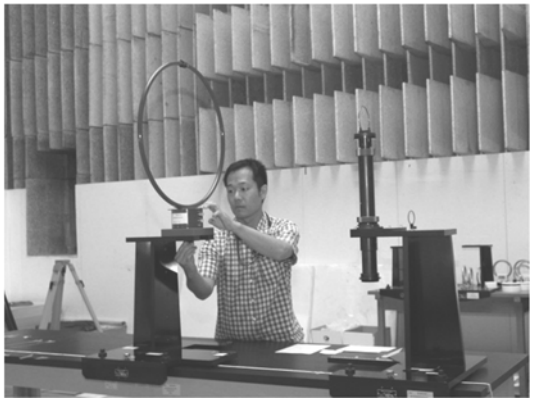
**AIST and measurement standards**

After joining AIST, I was placed in the Metrology Institute of Japan. This was the largest research division in AIST, and the result of consolidating departments such as the metrology and general electronics laboratories involved in measurement standards before the establishment of AIST (back when AIST was former Ministry of International Trade Agency of Industrial Science and Technology), into one organization when AIST was

established. Due to organizational changes in April 2015, the division is now separated into four departments. The word "standards" in "measurement standards" causes some to mistake AIST for a division of a laboratory involved in standards documents for ISO, IEC, and even CISPR. "Measurement standards" refer to what are known as "metrology standards". The making of the aforementioned standards documents, on the other hand, is known as "standardization". Laboratories and their measurement standards divisions research how to maintain, manage, build, brush up, and even calibrate physical and chemical amounts in the International System of Units. I often explain metrology standards by saying that I am involved in deciding the kinds of physical constants that appear in chronological scientific tables. Because you are all familiar with standardization (the making of standards documents), this should give most of you an idea of what I mean by metrology standards. Of course, we work not only on metrology standards, but also on standardization such as for individual measurement techniques by making ISO and IEC standards documents.

**Work and research activities at AIST**

While I am in charge of research on metrology standards in AIST, since joining AIST I have been involved in low-frequency-band antennas and electromagnetic fields of 30 MHz or less excluding DC, at the Metrology Institute of Japan Electromagnetic Waves Division Electromagnetic Fields Section (now the Research Institute for Physical Measurement Electromagnetic Fields Standards Group). Specifically, I am in charge of physical amounts in loop antenna standards, monopole antenna standards, and alternating magnetic field standards. I have done R&D, maintenance and management for these national standards and high-precision calibration methods that have achieved traceability to the International System of Units, and I also provide calibration services with the aim of giving back to society.



Setting up a national-standard loop antenna for measuring the loop antenna to be calibrated via Reference antenna method

Because electromagnetic wavelengths at the 30-MHz level are around 10 m, electromagnetic wavelengths at frequency bands of 30 MHz or less are at least 10 m. Therefore, antennas used for these frequency bands are not resonant antennas such as those used for high-frequency bands; they are characteristically extremely small, electric antennas. When calibrating antennas for these frequency bands, antenna sensitivity is lowered, thus requiring measurements to be conducted in the near field. Antenna calibration methods must therefore take these characteristics into account.

Recently, we are also conducting research that is not necessarily related to measurement standards. Specifically, we are doing R&D on new types of electromagnetic field sensors, and similarly, R&D on real-time visualization techniques for electromagnetic waves using quantum phenomena (mutual interaction among atoms, electromagnetic waves, and laser ) and without using existing metal antennas.

Masanori Ishii

| | |
|---|---|
| March 2002 | Doctor of Engineering Completed a doctoral program at the Graduate School of Electro-Communications at the University of Electro-Communications, majoring in electronic engineering |
| April 2002 onward | Joined the independent agency "National Institute of Advanced Industrial Science and Technology (currently a national research agency) (as of present) |
| July 2017 onward | Member of the VCCI Measurement Facility Registration Committee |
| April 2018 onward | Member of the VLAC Accreditation Committee |

# Committee Activities

## ● Board of Directors

| Date | June 12, 2018 |
|---|---|
| Agenda items | ● 34th meeting of the Board of Directors<br>- Agenda item 1 FY 2017 business report (draft)<br>- Agenda item 2 FY 2017 financial statement (draft)<br>- Agenda item 3 Convening of the regular Board of Councillors meeting for FY 2018<br>- Agenda item 4 Appointment of the Secretary General |
| Decisions and reported items | - Agenda item 1 The proposal was approved as is.<br>- Agenda item 2 The proposal was approved as is.<br>- Agenda item 3 The proposal was approved as is.<br>- Agenda item 4 The proposal was approved as is. |

## ● Board of Councillors

| Date | June 26, 2018 |
|---|---|
| Agenda items | ● 13th meeting of the Board of Councillors<br>- Agenda item 1 FY 2017 business report<br>- Agenda item 2 FY 2017 financial statement (draft) |
| Decisions and reported items | - Agenda item 1 The proposal was approved as is.<br>- Agenda item 2 The proposal was approved as is.<br>- Reported item 1 FY 2018 business plan<br>- Reported item 2 FY 2018 budget |

## ● Steering Committee

| Date | May 23, June 20, July 18, 2018 |
|---|---|
| Agenda items | ● Agenda item 1 FY 2017 business report (draft)<br>● Agenda item 2 FY 2017 financial statement (draft)<br>● Agenda item 3 On new VCCI members for the period from April to June<br>● Agenda item 4 Discuss next term's candidates for the Steering Committee<br>On the period for combining VCCI operation standards (V-2 and VCCI 32-1)<br>● Agenda item 5 Handling deliberate transmissions from wireless transmitters in compliance verification of conducted emissions, and related spurious emissions (draft)<br>● Agenda item 6 Handling measurement of multimedia devices with wireless functionality |
| Continuing agenda items | ● Agenda item 4<br>● Agenda item 5 |
| Decisions and reported items | ● Agenda item 1 Accepted and submitted to the Board of Directors<br>● Agenda item 2 Accepted and submitted to the Board of Directors<br>● Agenda item 3 Approved<br>● Reported item 1 Report on the May to July activities of each subcommittee (Technical, International Relations, Market Sampling Test, Educational, Public Relations)<br>● Reported item 2 Status reports on secretariat work (trends in joining and leaving VCCI members, compliance verification reports, income and expenditures, etc.)<br>● Reported item 3 Report on the thesis presentation and participation in the 2018 Joint IEEE EMC & APEMC Symposium<br>● Reported item 4 Overall report on the FY 2017 Business Report Meeting<br>● Reported item 5 Overall report on the VCCI seminar at the Oita Industrial Research Institute |

## ● Technical Subcommittee

| Date | June 1, July 3, 2018 | |
|---|---|---|
| Agenda items | ● Agenda item 1 | On the Technical Subcommittee's planned activities for FY 2018 |
| | ● Agenda item 2 | On the CISPR 32 Edition 2.0 results of verifying the maintenance cable layout |
| | ● Agenda item 3 | On tests on the impact on the results of using connected pair wires to measure 2W or 4W with the transformer-couple AAN for eight wires |
| | ● Agenda item 4 | On the impact of intentional frequencies and relevant spurious emissions from MMEs with embedded wireless functionality (WPT, RFID) on compliance verifications |
| | ● Agenda item 5 | On guidance for handling intentional frequencies of conducted emissions and relevant spurious emissions |
| | ● Agenda item 6 | On considerations of calibration using free-space antenna factor |
| | ● Agenda item 7 | On the VHF-LISN CISPR standardization proposal |
| Continuing agenda items | ● Agenda item 4 | |
| | ● Agenda item 5 | |
| | ● Agenda item 6 | |
| | ● Agenda item 7 | |
| Decisions and reported items | ● Reported item | On the Technical Subcommittee's past activities for FY 2018 |
| | ● Reported item | On the report on the 2018 Joint IEEE EMC & APEMC Symposium |
| | ● Reported item | On the CISPR Berlin conference report |

## ● International Relations Subcommittee

| Date | May 11, June 8, July 26, 2018 |
|---|---|
| Agenda items | ● Agenda item 1 Survey on trends in world EMC standards<br>● Agenda item 2 Survey on world ITE-related standards<br>● Agenda item 3 International forum<br>● Agenda item 4 Overseas survey (Saudi Arabia: GSO, UAE: ESMA) |
| Continuing agenda items | ● Agenda item 1<br>● Agenda item 3<br>● Agenda item 4 Summary of overseas survey results |
| Decisions and reported items | ● Agenda item 3 The international forum for FY 2018 was held on October 19 (Fri) at CEATEC JAPAN, and lecturers were chosen from the EU, Australia, China, and South Africa.<br>● Agenda item 4 A survey on regulations was held in July as a part of an overseas survey, and with visits made to GSO of Saudi Arabia and ESMA of UAE.<br>● Reported item 1 The FY 2018 survey of trends in world EMC standards was limited to VCCI members. A survey was then conducted on world EMC and other regulations. This survey was published in the survey sheet for world ITE-related standards.<br>● Reported item 2 Reports on the meeting with the EU Commission in April were limited to VCCI members. A survey was then conducted on world EMC and other regulations. This survey was published in the breaking news on EMC surveys. |

## ● Market Sampling Test Subcommittee

| Date | May 10, June 14, July 6, 2018 |
|---|---|
| Agenda items | ● Agenda item 1 Action on cases of "Failed – tentative"<br>● Agenda item 2 Document examination<br>● Agenda item 3 Joint committee<br>● Agenda item 4 Selection policy and focus topics<br>● Agenda item 5 Other |
| Continuing agenda items | ● Agenda item 1 Discuss how to address three cases of "Failed – tentative" last fiscal year |
| Decisions and reported items | ● Agenda item 2 There were reports on the six cases that were examined in advance. One case lacked measuring points for both radiation and conduction, and a request was sent for re-measurement. For the remaining five cases, corrections to the test reports were reviewed with respect to the concerns, and it was determined that there were no problems.<br>● Agenda item 3 Discuss notes on this fiscal year's marketing sampling test with the four specified testing organizations. The subcommittee explained its approach to differences between the testing methods of the existing technical standard V-3 and the new technical standard VCCI-CISPR 32, and agreement was reached on test targets, placement method, measurement method, and other points.<br>● Agenda item 4 100 market sampling tests will also be conducted this fiscal year. Tests focus on products such as those in new fields, I/O cable and other products, and those tested at overseas testing laboratories.<br>● Agenda item 5 This fall, a member of this subcommittee will be a lecturer at the workshop in Shanghai. |

## ● Education Subcommittee

| Date | May 9, June 20, July 11, 2018 |
|---|---|
| Agenda items | ● Agenda item 1 On the questionnaire results for the 37th course on basic EMI measurement techniques, the 47th course on the basics of electromagnetic waves and EMI techniques for measurement at 1GHz or less<br>● Agenda item 2 On considerations for revising education and training textbooks planned for FY 2018<br>● Agenda item 3 Participation in a study group on uncertainty |
| Continuing agenda items | ● Agenda item 2 |
| Decisions and reported items | ● Agenda item 1 - The 37th course on basic EMI measurement techniques was held on May 18, with 23 attendees.<br>- The 47th course on the basics of electromagnetic waves and EMI techniques for measurement at 1GHz or less were held on June 7 - 8 and 14 - 15, with 17 attendees.<br>- Questionnaire results showed that attendees were satisfied with both courses.<br>● Agenda item 2 Of the considerations for education and training textbooks held in FY 2018, two (basic EMI measurement techniques, basics of electromagnetic waves and EMI techniques for measurement at 1GHz or less) were completed. We will go on to make the remaining three textbooks and systematically conduct education and training.<br>● Agenda item 3 We had Hideyuki Tanaka of AIST give a lecture, "Study Group on Uncertainty in Measurement", which we attended. |

## ● Public Relations Subcommittee

| Date | May 11, June 18, July 13, 2018 |
|---|---|
| Agenda items | ● Agenda item 1 On Techno-Frontier 2018<br>● Agenda item 2 On newly exhibited tools<br>● Agenda item 3 On COMPUTEX TAIPEI 2018<br>● Agenda item 4 On surveys of overseas exhibitions<br>● Agenda item 5 On the English versions of videos<br>● Agenda item 6 On CEATEC 2018 |
| Continuing agenda items | ● Agenda item 4, 6 |
| Decisions and reported items | ● Agenda item 1 We held an exhibit at Techno-Frontier 2018 from April 18 to 20, and conducted a questionnaire with responses from approximately 230 individuals.<br>● Agenda item 2 We revamped the VCCI booth design starting from Techno-Frontier 2018.<br>● Agenda item 3 There was a report that we will hold an exhibit at COMPUTEX TAIPEI 2018 (see page 21).<br>● Agenda item 5 We completed the English version of the VCCI introductory video completed in FY 2017, and published it on the website. |

## ● Measurement Facility Registration Committee

| Date | April 23, 2018 |
|---|---|
| Agenda items | ● Reviewed the result of deliberations by the Measurement Facility Examination WG and concluded as follows. |
| Decisions | Conformity certified (including cases certified with qualification comments after checking of supplementary papers): 26 companies<br>Radiated EMI measuring facilities: 15<br>Mains ports conducted EMI measuring facilities: 16<br>Telecommunication ports conducted EMI measuring facilities: 11<br>Radiated EMI measurement facilities above 1GHz: 7<br>Applications returned with comments: None<br>Applications carried over to the next meeting: None |
| Date | May 21, 2018 |
| Agenda items | ● Reviewed the result of deliberations by the Measurement Facility Examination WG and concluded as follows. |
| Decisions | Conformity certified (including cases certified with qualification comments after checking of supplementary papers): 19 companies<br>Radiated EMI measuring facilities: 5<br>Mains ports conducted EMI measuring facilities: 8<br>Telecommunication ports conducted EMI measuring facilities: 7<br>Radiated EMI measurement facilities above 1GHz: 6<br>Applications returned with comments: None<br>Applications carried over to the next meeting: None |
| Date | June 18, 2018 |
| Agenda items | ● Reviewed the result of deliberations by the Measurement Facility Examination WG and concluded as follows. |
| Decisions | Conformity certified (including cases certified with qualification comments after checking of supplementary papers): 17 companies<br>Radiated EMI measuring facilities: 5<br>Mains ports conducted EMI measuring facilities: 4<br>Telecommunication ports conducted EMI measuring facilities: 2<br>Radiated EMI measurement facilities above 1GHz: 11<br>Applications returned with comments: None<br>Applications carried over to the next meeting: 1 |

## ●Report on Committee Activities: List of Acronyms

| Abbreviation | Full Name |
|---|---|
| AAN | Asymmetric Artificial Network |
| AMN | Artificial Mains Network |
| ANSI | American National Standards Institute |
| APD | Amplitude Probability Distribution |
| APLAC | Asia Pacific Laboratory Accreditation Corporation |
| AQSIQ | General Administration of Quality Supervision , Inspection and Quarantine of the People's Republic of China |
| BSMI | Bureau of Standards, Metrology and Inspection |
| CALTS | Calibration Test Site |
| CB | Certification Body |
| CB | Competent Body |
| CCC | China Compulsory Product Certification |
| CD | Committee Draft |
| CDN | Coupling Decoupling Network |
| CDNE | Coupling Decoupling Network for Emission |
| CDV | Committee Draft for Vote |
| CEMC | China Certification Center for Electromagnetic Compatibility |
| CEN | European Committee for Standardization |
| CENELEC | European Committee for Electro Technical Standardization |
| CISPR | International Special Committee on Radio Interference |
| CMAD | Common Mode Absorbing Device |
| CQC | China Quality Certification Center |
| CSA | Classical (Conventional) Site Attenuation |
| CSA | Canadian Standards Association |
| DAF | Dual Antenna Factor |
| DC | Document for Comment |
| DoC | Declaration of Conformity |
| DOW | Date of Withdrawal |
| DTI | Department of Trade and Industry |
| DUT | Device Under Test |
| ECANB | EC Association of Notified Bodies |
| Ecma | Ecma International |
| EICTA | European Information, Communications and Consumer Electronics Technology Industry Association |
| EMCC | Electro Magnetic Compability Conference |
| EMCAB | Electromagnetic Compatibility Advisory Bulletin |
| EMF | Electromagnetic Field |
| EMF | Electromotive Force |
| ETSI | European Telecommunication Standards Institute |
| EUANB | European Union Association of Notified Bodies |
| EUT | Equipment Under Test |
| FAR | Fully Anechoic Room |
| FDIS | Final Draft International Standard |
| GB | guo jia biao zhun（National Standard of China） |
| GSO | Gulf Cooperation Council Standardization Organization |
| ICES | Interference-Causing Equipment Standards |
| ICNIRP | International Commission on Non-Ionizing Radiation Protection |
| IS | International Standard |
| ISM | Industrial Scientific and Medical |
| ITE | Information Technology Equipment |
| LCL | Longitudinal Conversion Loss |
| MME | Multimedia Equipment |
| MOU | Memorandum of Understanding |
| MP（法） | Magnetic Probe |
| MRA | Mutual Recognition Agreement/Arrangement |

| Abbreviation | Full Name |
|---|---|
| NCB | National Certification Body |
| NICT | National Institute of Information and Communications Technology |
| NIST | National Institute of Standards and Technology |
| NP | New Work Item Proposal |
| NSA | Normalized Site Attenuation |
| OFDM | Orthogonal Frequency Division Multiplex |
| PAS | Publicly Available Specification |
| PLT | Power Line Telecommunication |
| R&TTE | Radio & Telecommunications Terminal Equipment |
| RBW | Resolution Band Width |
| REF | Reference |
| RRA | Radio Research Agency |
| RRT | Round Robin Test |
| RSM | Reference Site Method |
| RVC | Reverberation Chamber |
| SAC | Semi Anechoic Chamber |
| S/N | Signal to Noise ratio |
| TF | Task Force |
| TG | Tracking Generator |
| UPS | Uninterruptible Power Supply |
| VBW | Video Band Width |
| VHF-LISN | Very High Frequency-Line Impedance Stabilization Network |
| VSWR | Voltage Standing Wave Ratio |
| WG | Working Group |
| WP | Working Party |

14th instalment

# Structure of the IEC 61000 Series of EMC Standards Made by TC77

Masamitsu Tokuda

## 1. Foreword

The IEC (International Electrotechnical Commission) EMC standards made by TC77 (77th dedicated committee meeting: Making EMC standards) are assigned IEC 61000 series numbers, but are composed of parts 1 (General) to 9 (Miscellaneous)[1-5].

This document explains the part structure of the IEC 61000 series and introduces the standards of the IEC 61000-1 (General) series.

## 2. Part structure of the IEC 61000 series

"EMC Zone" on the IEC home page contains a variety of information on EMC standards. Included is an introduction of the IEC 61000 series of standards made by TC77. Table 1 shows the part structure of the IEC 61000 series[4].

Part 1 (General) contains fundamental standards relating to basic concepts such as definitions and terms, functional safety and uncertainty of measurement. Part 2 (Environment) has standards such as on levels of compatibility with a variety of electromagnetic environments and their class categories, and electricity systems. Part 3 (Limits) mainly has standards for limit values on emissions of low-frequency bands (9 kHz or less) in electricity systems. Note that limit values for high-frequency bands (over 9 kHz) emissions are stipulated in the product line standards made by CISPR[6].

Table 1 Structure of the IEC 61000 series made by TC77

| Part | Description of Regulations |
|---|---|
| Part 1: General | - Basic concepts (basic principles, definitions, and terms) - Interference model<br>- Functional safety (an approach where safety functions and is executed to satisfaction)<br>- Uncertainty of measurement |
| Part 2: Environment | - Environment-related expressions<br>- Environment class categories<br>- Level of compatibility |
| Part 3: Limits | - Limit values for emissions<br>- Limit values for immunity (if standardization is not performed under the responsibility of the product committee) |
| Part 4: Testing and measurement techniques | - Measurement technology<br>- Testing technology |
| Part 5: Installation and mitigation guidelines | - Installation guidelines<br>- Countermeasure methods and devices |
| Part 6: Generic Standards | - Common emissions and immunity requests across a variety of environments |
| Part 9: Miscellaneous | |

Part 4 (Testing and measurement techniques) contains many standards on a variety of immunity test methods, but also contains measurement methods of low-frequency band emissions. Furthermore, standards on methods of high-

frequency emissions measurement are stipulated in the CISPR 16 series made by CISPR[6]. Part 5 (Installation and mitigation guidelines) has standards giving guidelines on device installation methods and EMC countermeasure methods. Part 6 (Generic Standards) contains common standards stipulating limit values for emissions and immunity for all devices installed in residential and industry environments. Parts 7 and 8 do not yet exist. Part 9 (Miscellaneous) exists, but currently has no corresponding standards.

**3. IEC 61000-1 (General) series standards**

Table 2 shows the IEC 61000-1 (General) series standards made by TC77 and its SC. IEC TR 61000-1-1 was made by the new committee of TC77, and stipulates standards for applying and interpreting basic EMC terms and definitions. IEC TR 61000-1-1 was issued by TR as a TR C 0007:1997 at JISC (Japanese Industrial Standards Committee), but was deprecated in August 2002. Meanwhile, EMC-related terms are stipulated in the IEC 60050-161 standards made in TC1 (Terms). These standards were issued in November 1997 by JIS as JIS C 60050-161:1997, "International Electrotechnical Vocabulary: Electromagnetic compatibility", and were last checked in October 2013.

IEC TR 61000-1-2 was also made by the new committee of TC77, and stipulates a methodology for achieving functional safety from an EMC perspective in electric and electronic systems. IEC TR 61000-1-3 was made by SC77C, which makes EMC standards relating to transient phenomena in high-power electromagnetics, and stipulates the impact of powerful HEMPs (high-altitude electromagnetic pulses) caused by nuclear detonations at high altitudes on consumer devices and systems. IEC TR 61000-1-4 was made by SC77A, which makes low-frequency EMC standards, and explains the historical background to standards on limit values for harmonic currents at power supply frequencies.

IEC TR 61000-1-5 was made by SC77C, and introduces fundamental items on electromagnetic phenomena of consumer systems that exist in HPEM (high-power electromagnetics) of 100V/m or more, which is not as powerful as a HEMP. IEC TR 61000-1-6 was made in the new committee of TC77 and in a joint working group (JWG) with CIS/A, and stipulates guidelines for evaluating measurement uncertainty. IEC TR 61000-1-7 was made by SC77A, and makes stipulations on relationships between various power quality definitions and power factors in non-sinusoidal wave conditions in electricity systems of single-phase systems. IEC TR 61000-1-8 is in the process of being made by SC77A, and has been distributed by 77A/1002/DTR in June 2018. It stipulates fundamental items relating to high-frequency current emissions and voltage phase angle in commercial power systems.

Table 2　IEC 61000-1 (general) series of standards made by TC/SC77 (as of July 2018)

| Standard No. | Latest Ver. | Made By | Standard Name |
|---|---|---|---|
| IEC TR 61000-1-1 | Ed.1.0: 92-05 | TC77 | Electromagnetic compatibility (EMC) Part 1-1: General - Application and interpretation of fundamental definitions and terms |
| IEC TR 61000-1-2 | Ed.1.0: 16-04 | TC77 | Electromagnetic compatibility (EMC) Part 1-2: General - Methodology for the achievement of functional safety of electrical and electronic systems including equipment with regard to electromagnetic phenomena |
| IEC TR 61000-1-3 | Ed.1.0: 02-06 | SC77C | Electromagnetic compatibility (EMC) Part 1-3: General - The effects of high-altitude EMP (HEMP) on civil equipment and systems |
| IEC TR 61000-1-4 | Ed.1.0: 05-05 | SC77A | Electromagnetic compatibility (EMC) Part 1-4: General - Historical rationale for the limitation of power-frequency conducted harmonic current emissions from equipment, in the frequency range up to 2 kHz |
| IEC TR 61000-1-5 | Ed.1.0: 04-11 | SC77C | Electromagnetic compatibility (EMC) Part 1-5: General - High power electromagnetic (HPEM) effects on civil systems |
| IEC TR 61000-1-6 | Ed.1.0: 12-07 | TC77<br>CIS/A | Electromagnetic compatibility (EMC) Part 1-6: General - Guide to the assessment of measurement uncertainty |
| IEC TR 61000-1-7 | Ed.1.0: 16-02 | SC77A | Electromagnetic compatibility (EMC) Part 1-7: General - Power factor in single-phase systems under non-sinusoidal conditions |
| IEC TR 61000-1-8 | 77A/1002/DTR: 18-06 | SC77A | Electromagnetic compatibility (EMC) Part 1-8: General - Harmonic current emissions and voltage phase angle in commercial power systems |

[References]

1) EMC electromagnetic environment handbook (Chairman of the Editing Committee: Risaburo Sato) References: EMC standards and rules (chief editor: Masamitsu Tokuda), Mimatsu (publisher), Maruzen (publisher), pp.88-110, September 2009.
2) Institute of Electrical Engineers of Japan: Noise immunity in electric and electronic devices, edited by the Survey Subcommittee (Chairman: Masamitsu Tokuda): Testing and design handbook for noise immunity in electric and electronic devices, Kagaku Gijutsu Shuppan (publisher), Maruzen (publisher), pp.31-32, pp.54-55, April 2013.
3) Masamitsu Tokuda: I. International standardization organizations relating to EMC and EMC standards, special event "World EMC standards and rules" (FY 2018 edition), Japan Management Association, p.2-12, April 2018.
4) IEC, EMC Zone, Basic EMC Publications, IEC 61000 Structure
http://www.iec.ch/emc/basic_emc/basic_61000.htm
5) IEC Guide 107: Electromagnetic compatibility - Guide to the drafting of electromagnetic compatibility publications
https://webstore.iec.ch/publication/7518
6) Masamitsu Tokuda: Division of roles of CISPR and TC77, VCCI Dayori, No.126, pp.9-11, October 2017.

Masamitsu Tokuda

1967 Graduated from the Department of Electronics and Information Engineering, School of Engineering, Hokkaido University
1969 Entered the Nippon Telegraph and Telephone Public Corporation, and was placed in the Research Institute of Electrical Communication
1987 Leader of the NTT General Communications Laboratory's Communications and EMC Research Group
1996 Professor of electronic engineering at the School of Engineering, Kyushu Institute of Technology
2001 Professor of electronic communications and engineering at the Faculty of Engineering, Tokyo City University (then Musashi Kogyo University)
2010 Professor Emeritus at the Tokyo City University
Visiting co-researcher at the Graduate School of Frontier Sciences, The University of Tokyo

Main awards received

1986 Received the IEICE Electronics Society Achievement Award
(for research on the logic of optical fiber cable design and evaluation methods)
1997 Received the FY 1997 Information and Communications Achievement Award
(Ministry of Posts and Telecommunications)
(for developing and standardizing EMC technology)
2003 Received the Minister of Economy, Trade and Industry Award as an achiever in the industry standardization business
2004 Appointed Fellow at the IEICE Electronics Society
2007 Promoted to IEEE Fellow

# Report on the 2018 Joint IEEE EMC & APEMC Symposium

Technical Subcommittee

The Technical Subcommittee attended the thesis presentations at the symposium and the accompanying workshops and special sessions, with the main purpose of seeing the thesis submitted by VCCI and adopted for the 2018 Joint IEEE EMC & APEMC Symposium.

Venue : Suntec Convention & Exhibition Center
Singapore
Period : May 14 (Mon) - May 17 (Thu), 2018
Participants : Hironari Tanaka, member of the Technical Subcommittee (Ohtama Calibration Service Co.,Ltd.)
Kunihiro Osabe, member of the Technical Subcommittee (VCCI)
Hidenori Muramatsu, head of the Technical Division (VCCI)

## 1. Overview

The technical program was composed of workshops, tutorials, a keynote speech, special sessions, topical meetings, regular sessions, plenary talks, an opening ceremony, interactive forum sessions, experiments, and demonstrations. Participants came from 32 countries and regions, numbering around 650. At the technical sessions, 392 theses were adopted from over 20 countries and regions. 41 theses from Japan were adopted, including at the poster session. Theses from Japan were mostly from universities and research institutes. The two theses submitted by VCCI and adopted for the symposium were presented by Technical Subcommittee members Hiroshige Tanaka and Kunihiro Osabe.

## 2. Presentation of theses submitted by VCCI

Among the technical sessions, the morning session on the 15th (Tue) was on EMC measurement, with a speech by Kunihiro Osabe, and the afternoon session on the 16th (Wed) was the poster session "Interactive Forum Sessions", with a speech by Hiroshige Tanaka.

① Impacts to Measurement Uncertainty of Radiated EMI Measurement by Setting Terminating Condition of AC Mains Cable Leaving from Test Area
(VHF-LISN WG: Subcommittee members Osabe and Kuwabara, and Secretariat Muramatsu)

Theses were presented on uncertainty when measuring radiated emissions, summarized based on the estimated SCU (Standards Compliance Uncertainty) for cases where termination conditions are not

stipulated for EUT main cables, and cases where such conditions are stipulated by VHF-LISN.
Questions asked at the presentation were about future trends in VHF-LISN standardization and the difference in measurement uncertainty with termination by CMAD.
The speakers explained that a joint ad-hoc group consisting of the CISPR-A subcommittee that currently makes basic standards as the SC-A CISPR 16 series, and the CISPR-I subcommittee that makes product standards relating to multimedia devices, was now starting to discuss VHF-LISN standardization. On the difference with termination in CMAD, speakers explained that there was a large difference in interconnectedness among sites, and that there would be a large difference in SCU from the RRT results.

② A LPDA Free-Space Factor Calibration
(Antenna Calibration / Site Validation WG: Subcommittee members Tanaka, Shimanoe, and Yoshihara, and Secretariat Muramatsu)

Because even ANSI does not show calibration methods and correction values for the free-space antenna factor $AF_{FS}$ calibration method for LPDA antennas, test results for this calibration method were presented.
Antenna height and distance between antennas, polarization direction, and other parameters for making a free space were shown as calibration conditions. The $AF_{FS}$ required by these conditions was compared with the quasi-free-space antenna factor $AF_{NFS}$ required by ANSI C63.5 standard site methods, resulting in a difference of around 0.7dB between $AF_{FS}$ and $AF_{NFS}$ at 400MHz or more. Speakers explained that there was only a small difference from free-space calibration methods.
Questions asked at the presentation were about the site where these experiments were made, and on the 11m-tall antenna mast installation.

## 3. Other session details

The following is an overview of other main sessions attended by the Technical Subcommittee.

- Opening Ceremony & Plenary Talks
  Plenary Talk Part I
    Introduction to Chrome OS Hardware

The opening ceremony of the 2018 Joint IEEE EMC & APEMC symposium was followed by the Plenary Talk Part I. This talk was mostly about initiatives to solve many issues relating to EMC before the Chromebook was released, especially EMC problems associated with the degree of integration in USB Type-C development and available power of 100 W.

Plenary Talk Part II

Frontiers in Computational Time Reversal for Electromagnetic Synthesis

At the Plenary Talk Part II, we had the opportunity to hear a talk that drew on a wealth of experience on new concepts such as non-chronological acoustics using computer-processed virtual worlds, image processing relating to electromagnetic waves, remote sensing, and electromagnetic field simulations. The test conditions given in this talk provided helpful reference for VCCI's own test simulations.

- Tutorials

TT-05: Advances in Antenna Calibration and Measurements for EMC Applications

Session provided a commentary on measurement uncertainty in calibration relating to antenna calibration methods in EMI measurements, with an analysis of the impact of measurement environments on calibration.

A comment was made on the requirements of the calibration method standard CISPR 16-1-6 for antennas used for EMI measurement at 1 GHz or less, that from the calculated values for FAR and OATS/SAC SIL (site insertion loss) and in comparison with radiated emissions tolerance values in OATS/SAC, tolerance values in FAR measurement need to be changed for antennas installed on floor surfaces. We proposed this in a thesis at the 2016 EMC Europe, in which we supported tolerance values by polarized wave in FAR measurements planned to be added as Annex B (information) for IEC 61000-6-4, and Annex A (information) for IEC 61000-6-3, which are now being revised.

- Technical Sessions

SS-10: Techniques and Measures to Manage Risks with Regard to EM Disturbances

Theses presented at this session were on the topic of risk management techniques and countering methods for electromagnetic interference.

Among these, a thesis was presented on the revised draft of the IEEE 1848 standards providing a practical way of managing functional safety through electromagnetic interference and other risk minimization methods. It was explained that this thesis's methods for managing immunity countermeasures using various electromagnetic interference waves, ranging from hardware included in products, devices, and systems using electronic technology to software life cycles, comply with IEC 61000-1-2:2016, which establishes a methodology for achieving functional safety regarding electromagnetic phenomena.

TC-04: EMI/EMC

At this session, theses were presented regarding various problems with electromagnetic interference, from various perspectives.

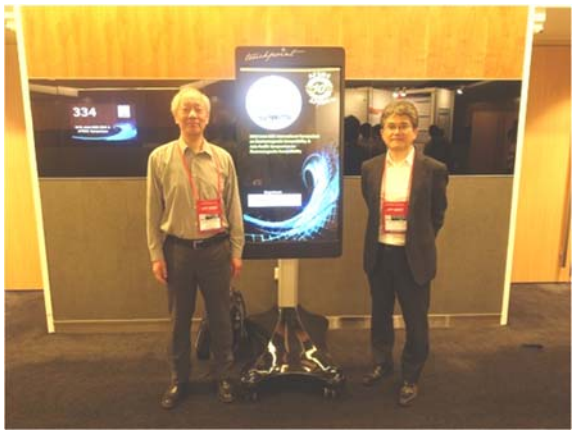
One of these theses was on the tested possibilities of calibration methods for antennas used to measure radiated emissions at 1 GHz or less in an anechoic chamber. VCCI is experimenting on antenna calibration, so while a conclusion was drawn from the experiment results, hearing this talk made us look forward to future testing, for example on the relevance to requirements for CALTS based on CISPR 16-1-5.

## 4. Impressions

VCCI's research results were presented at the 2018 Joint IEEE EMC & APEMC Symposium. VCCI also received many comments from listeners, and engaged in a lively discussion, thus achieving its intended goal of participating in the event.

This symposium was structured to build upon previous topics such as fundamental EMC measurement methods and evaluation methods, and address EMC inside vehicles, EMC in next-generation mobile communications systems, managing risks caused by electromagnetic interference and and information security, and issues identified by engineers involved in product development in the area of product design. These areas were the central theme of EMC at the symposium.

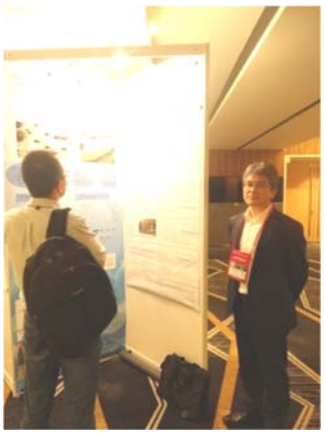
The next session of EMC Sapporo & APEMC 2019 is planned to be held in Sapporo. The Technical Subcommittee will do tests on issues in measurement methods, conduct experiments, and actively submit theses to the symposium based on its test results, while continuing to exchange opinions and information with experts.




Venue entrance

Exhibition hall


Presentation by Kunihiro Osabe of the Technical Subcommittee



Presentation by Hironari Tanaka of the Technical Subcommittee

# Report on VCCI Seminar for the Info-Communication Promotion Month

Steering Committee

The following section outlines and describes the " VCCI Seminar for the Info-Communication Promotion Month ".

1. Date : May 25, 2018 (Fri) 13:15 - 17:00
2. Venue : VCCI 5F Conference Room
3. Attendees : Approx. 40 persons
4. Special lecturers : Masamitsu Tokuda (Professor Emeritus at Tokyo City University, visiting co-researcher at The University of Tokyo)
5. Lecturers : Akira Oda, Senior Managing Director of VCCI
   Minoru Hirahara, Chairman of the Technical Subcommittee (Fujitsu Ltd.)
   Shinichi Okuyama, Chairman of the Education Subcommittee (NEC Platforms, Ltd.)

6. Program

| Time | Topic | Lecturer |
|---|---|---|
| 13:15 - 13:55 | (1) Opening speech<br>(2) Introduction to VCCI's activities and future trends in EMC rules | Akira Oda<br>Senior Managing Director of VCCI |
| 13:55 - 14:45 | (3) On the international standards for multimedia devices (CISPR 32)<br>- What is CISPR 32?<br>- Main differences between CISPR 32 Editions 1 and 2<br>- Main differences between international standards and domestic reports | Minoru Hirahara<br>Chairman of the Technical Subcommittee |
| 15:00 - 15:40 | (4) Overview of the VCCI technical training business<br>- Overview of the technical training business and notes on measurement methods<br>- "GUIDE ON PREPARING TEST REPORT (For VCCI-CISPR 32)"<br>- Improving on EMI measurement techniques<br>- EMI Measurement Instrumentation Uncertainty | Shinichi Okuyama<br>Chairman of the Education Subcommittee |
| 15:40 - 16:30 | (5) Special lecture<br>Trends in EMC relating to smart grids in IEC | Masamitsu Tokuda<br>Professor Emeritus at the Tokyo City University, visiting co-researcher at The University of Tokyo |
| 16:30 - 17:00 | Q&A time | All lecturers |

7. Overview of the seminar

Every year, VCCI holds the VCCI seminar for information and communications as a monthly event with the Ministry of Internal Affairs and Communications, to reach not only VCCI members, but as wide a general audience as possible.

The latest seminar was held to promote understanding of VCCI's initiatives, trends in rules on electromagnetic interference waves, the CISPR 32 rules supporting multimedia devices, notes on making measurements, and more. At the end, a special lecture was given by Prof. Emeritus Masamitsu Tokuda of Tokyo City University, "EMC trends relating to smart grids in IEC", which gave participants a deeper understanding of EMC trends relating to smart grids.

Participants had many questions about measurement in compliance with CISPR 32, and seemed impressed by the event.

# Report on COMPUTEX TAIPEI 2018

Public Relations Subcommittee

Exhibition name : COMPUTEX TAIPEI 2018
URL : http://www.computextaipei.jp/index.html
Hosts : TAITRA (Taiwan External Trade Development Council)
TCA (Taipei Computer Association)
Period : June 5, 2018 (Tue) - June 9 (Sat)
Venue : Held at four venues simultaneously: Taipei World Trade Center Hall 1, Hall 3, Taipei International Convention Center, Nangang Exhibition Hall
Participants : Shinji Kuroda, Chairman of the VCCI Public Relations Subcommittee (Hitachi Information and Telecommunication Engineering, Ltd.)
Yasushi Hirakawa, member of the VCCI Public Relations Subcommittee (NEC Platforms, Ltd.)
Akira Oda, Senior Managing Director of VCCI
Naoyuki Tsurumi, Secretary General of VCCI
Masahiro Hoshino, General Manager of VCCI
Yoko Inagaki, Secretariat of VCCI
Naoko Hori, Secretariat of VCCI

Scale of exhibition : ,602 companies (from 28 countries and regions), 5,015 booths
Overseas buyer registrations : 42,284 (from 168 countries and regions)
Total number of attendees : Approx. 130,000

## 1. Purpose of the COMPUTEX TAIPEI exhibition

COMPUTEX TAIPEI is the largest ICT exhibition in Asia, attended by many buyers from overseas. Taiwan's ICT industry occupies an important position in the world supply chain, and provides a platform for prioritizing considerations when the world's major enterprises announce their revolutionary products. Many buyers and industry associates come from all over the world, as if to reflect this important position.

Because this largest ICT exhibition in Asia was the perfect chance for VCCI to promote and raise awareness of its activities and roles, VCCI exhibited a booth in the "SmarTEX area" exhibiting mainly IoT applications, for PR purposes and to draw more Taiwan ICT vendors to register as VCCI members.

## 2. Exhibit

- The booth was exhibited in the Taipei World Trade Center (TWTC) Hall 1, SmarTEX area.
- June 5 - June 9: The venue was opened to buyers from overseas and from Taiwan (VCCI exhibited its booth until June 8).

## 3. Status of VCCI's participation in exhibitions

With the help of local resident Ms. Fan, who acted as guide and interpreter, we distributed materials explaining our exhibit.

VCCI received active support for its PR activities.

The following materials were prepared in advance, and distributed after explanations were made at the booth, for example inside novelty bags.

<Materials>

- Novelty bags: 400
- English flyers: 400
- Local-language (Traditional Chinese) flyers: 400
- Guide to VCCI membership registration (English): 100
- Annual report: 100
- VCCI standards sheet (English): 400
- Standards compliance verification workflow (English): 400
- Period of migration to VCCI standards (English): 400

VCCI booth

## 4. Results of the exhibition and future plans

### 4.1 Overview of the COMPUTEX TAIPEI 2018 exhibition

The exhibition was held in Taiwan and Taipei over June 5 - June 9.

COMPUTEX TAIPEI 2018 is the largest-scale exhibition in Asia, and was held in the following four exhibition venues:

1. Taipei World Trade Center Exhibition Hall 1
   SmarTEX (IoT applications), touch applications / display products, communications / networks, mobile devices, peripheral equipment / accessories
2. Taipei World Trade Center Exhibition Hall 3
   InnoVEX (Innovations & Startups)
3. Taipei International Convention Center
   Special exhibition
4. Nangang Exhibition Hall
   1F: Business solutions (POS & ERP) / smart retail, embedded systems / IIoT components / parts, storage / database solutions, award-winning products exhibition, media area

4F: (Skydome): Gaming & VR/AR, iStyle (products certified for Apple Mfi), systems / solutions, exhibits by overseas companies, Chinese exhibit area

This fiscal year's COMPUTEX TAIPEI 2018 revolved around six main themes: "AI (artificial intelligence)", 5G (fifth generation of mobile network and communication technology)", "Blockchain (decentralized ledger technology)", "IoT (Internet of Things)", "Innovations & Startups", and "Gaming & VR", and over its five days, was attended by over 40,000 overseas buyers from 168 countries and regions. The top ten countries and regions of overseas buyers were the U.S., Japan, China, Hong Kong, South Korea, Thailand, Malaysia, Germany, India, and Philippines, in that order. The U.S. and Japan had mostly the same number of attendees (a little more than 4,000).

The SmarTEX area, where VCCI had its booth, included exhibitions relating to a technology called "AIoT (AI + IoT)", which combines the strengths of the two evolving technologies of AI (artificial intelligence) and IoT (Internet of Things) applications. Technologies that received particular attention include: servers that support AI computing and storage of vast amounts of data, AIoT solutions such as hybrid cloud systems for AI and data analysis, a diverse range of products for smart homes and smart healthcare, and next-generation smart monitors that accurately determine the number of customers in a store and the length of their stay via image analysis functionality and sophisticated learning algorithms.

### 4.2 PR activities

- Local-language and English flyers were made and distributed, for example by including them with materials such as VCCI membership registration guides, annual reports, and standards sheets inside novelty bags.
- Local interpreters were used to make explanations in the local language, to deepen Taiwan IT vendors' understanding of VCCI.
- To those who expressed interest when asked if they knew the VCCI Mark, and those who took interest and stopped at the booth of their own accord, we explained the information in our flyers and showed attendees the VCCI Mark on digital cameras and smartphone electromagnetic displays we brought to explain the purpose of the VCCI Mark in a simple, accessible manner.
- We received business cards from those who showed an active interest in VCCI, to keep in touch and follow up with them in the future.
- Among VCCI booth attendees, we saw a rise in the number of attendees from VCCI-member enterprises who came to the booth to greet us, and non-VCCI members who came to hear about VCCI because they knew of it and wanted to export their products to Japan. We felt there was greater awareness of VCCI activities and the VCCI Mark.

### 4.3 Trends in VCCI booth attendees

- Many local Taiwanese vendors attended this year as well, and many asked about becoming VCCI members (enterprises that wanted to become VCCI members: 10 companies, compared to around 15 companies last year).

- Aside from Taiwan, there were attendees from Chinese head offices and other ASEAN region countries such as Indonesia, Singapore, and Malaysia. There were also attendees from India and Iran. We felt that our exhibition had attained worldwide status.
- Many ODM/OEM manufacturers came to ask how to become VCCI members, because buyers from Japan apparently sometimes ask such companies whether they are VCCI members.

### 4.4 Results of the event

- Considering the VCCI booth was toward the center of the main exhibition venue, we received many attendees, and were able to distribute all the flyers and novelty bags we brought.
- We received 262 business cards from VCCI booth attendees, and examined and followed up on them after they returned to their home countries.
- VCCI booth attendees: Approx. 300; those that wanted to become VCCI members: Around 10 companies, now being handled individually.

### 4.5 Other

- Many attendees asked about our novelty bags with the VCCI Mark hanging from the booth counter, or began by asking us about VCCI after seeing "What is VCCI?" written on the local-language poster on our booth wall, providing a good opportunity to explain the VCCI Mark and VCCI to them.
- Surprisingly few other booths were distributing novelty bags, and by handing out VCCI novelty bags, we were able to have many attendees listen to us talk about VCCI. VCCI booth attendees walked around the venue carrying novelty bags with the VCCI Mark on them, providing even more effective PR.

### 4.6 Impressions

COMPUTEX TAIPEI gathers and exhibits cutting-edge ICT products all in one place, with over 140,000 related buyers and manufacturer associates attending from inside and outside Taiwan. Exhibitions are held not only in the Taiwan World Trade Center Halls 1 and 3 near Taipei 101 Bldg., but also at the Nangang Exhibition Hall (usually known as "Nangang") approximately 8 km away.

In the past few years, many major Taiwanese enterprises such as ASUS, Acer, BenQ, and Microstar have been holding exhibitions in Nangang, thus drawing more attendees to Nangang. As a result, Nangang has become the main venue of COMPUTEX TAIPEI.

At Nangang this year, we visited six booths of enterprises such as non-VCCI-member computer manufacturers from Taiwan and China that had not yet expanded to the Japanese market - that is to say, assembled products manufacturers - and explained VCCI to them.

Although VCCI has been holding exhibits at Taipei World Trade Center Hall 1 every year, the exhibition theme of Hall 1, "SmarTEX", mainly involved IoT applications - quite a different field from the VCCI activities we wanted to promote. Therefore, from now on, we will consider exhibiting at Nangang, where exhibitions are mainly for ITE/MME products.

Because participating in exhibitions is an effective method of impressing as many people as possible in a short time, we will consider surveying and participating in additional overseas exhibitions in the future, and hope to conduct our PR activities continuously on a global scale.


Guide staff


Venue: Taipei World Trade Center Hall 1


Venue: Taipei World Trade Center Hall 3


Venue: Nangang Exhibition Hall

# Report on the FY 2017 Business Report Meeting

VCCI Council

The following section gives an overview and some details on the FY 2017 Business Report Meeting.

Date : 13:30 - 17:00 July 6, 2018 (Fri)
Venue : B2F Hall, Japan Society for the Promotion of Machine Industry
Number of attendees : Approx. 50

Program

| Topic and VCCI members who gave reports | |
|---|---|
| Greeting | Keiichi Kawakami, President of VCCI |
| Business report | Akira Oda, Senior Managing Director of VCCI |
| Overview of Steering Committee activities | Hideyuki Ohashi, Chairman of the Steering Committee |
| On the activities of each Subcommittee | |
| Technical Subcommittee | Minoru Hirahara, Chairman of the Technical Subcommittee |
| Education Subcommittee | Shinichi Okuyama, Chairman of the Education Subcommittee |
| Market Sampling Test Subcommittee | Hiroaki Suzuki, Vice Chairman of the Market Sampling Test Subcommittee |
| International Relations Subcommittee | Kazuyuki Hori, Vice Chairman of the International Relations Subcommittee |
| Public Relations Subcommittee | Shinji Kuroda, Chairman of the Public Relations Subcommittee |
| Special lecture : Directing Japanese enterprises in the age of IoT<br>From craftsmanship and salesmanship to value formation through the use and application of data<br>Lecturer : Koichi Ogawa, Professor of Engineering<br>Senior Researcher, Policy Alternatives Research Institute, The University of Tokyo and advisor to independent administrative agency NEDO (New Energy and Industrial Technology Development Organization) | |

The following is an outline of the introductory greeting from VCCI President Keiichi Kawakami:

- VCCI now welcomes its tenth anniversary of becoming a general incorporated foundation, with 1,136 VCCI-member companies as of the end of last fiscal year. In November 2016, VCCI led the way globally in enforcing and applying new rules for multimedia devices based on CISPR 32, and application of the new rules is steadily expanding. President Kawakami thanks the relevant authorities and VCCI members for their help in this achievement.
- Recently, information technology equipment (ITE) is bringing about great changes in the world. We are reaching an age where various things in our social activities are connected via the internet, integrated with sensors, and used to control various actions. Because VCCI will play a greater role than ever in helping to create clean electromagnetic environments, we want to make sure to promote its activities into the future.

Next was a report from Akira Oda, Senior Managing Director of VCCI, on the business report for FY 2017 and business plans for FY 2018. The following gives an outline of this talk:

FY 2017 business report

- Overview of VCCI in FY 2017, its organization, councillors, and executives
- Changes in the number of VCCI members, structure of overseas VCCI members, changes in the number of compliance verification reports, operation through mutual acceptance of testing laboratory data, and site registration status
- Main business conducted in FY 2017
  Workshops (U.S. and Taiwan), improving exchange with relevant overseas institutions in the U.S., Europe, and Taiwan, ensuring that market sampling tests are conducted, having two harmonized standards adopted as J standards in the Electrical Appliance and Material Safety Law

FY 2018 business plan

- On focus policies in the operation of VCCI in FY 2018
  Supporting international standards for multimedia devices (CISPR 32), improving exchange with overseas institutions, improving the credibility of the VCCI Mark and compliance management, supporting harmonized standards of the Electrical Appliance and Material Safety Law

Next, Hideyuki Ohashi (Mitsubishi Electric Corporation) gave a report on the Steering Committee:

- On the structure of VCCI committees in FY 2017, the role and business of subcommittees, and members of the Steering Committee
- The following were reported regarding the main activities in FY 2017:
  Activities to disseminate and raise awareness of new rules based on CISPR 32 Edition 2.0, exchange of opinions with overseas government agencies and industry associations, MOU operation and information exchange with overseas accreditation bodies, holding of seminars, problem-solving task force activities

- The following were given as the main planned activities for FY 2018:
  Workshops to disseminate and raise awareness of the new rules, exchange of opinions with relevant institutions, VCCI seminars, and expansion of compliance with the new rules based on CISPR 32

Next were reports on the activities of each subcommittee.

Minoru Hirahara (Fujitsu Ltd.) gave a report on the Technical Subcommittee:

- On the basic policy, activity policy, and FY 2017 activities of the Technical Subcommittee
  The following with regard to FY 2017: Compliance with CISPR, radiated emissions, conducted emissions, antenna calibration and site evaluation, each VHF-LISN working group's past activities, results of activities in the international EMC symposium, guidance on rules based on CISPR 32, testing of impacts of turning wireless functionality on and off
- On the organization of the Technical Subcommittee and planned activities for FY 2018
  On the planned activities of each working group in FY 2018, etc.

Shinichi Okuyama (NEC Platforms, Ltd.) gave a report on the Education Subcommittee:

- On subcommittee activities in FY 2017
  On the training sessions supporting the "technical standard" VCCI-CISPR 32 were held for measurement engineers
  On the "Basic Course for Measurement Engineers", "Course for Measurement Engineers below 1 GHz", "Applying Automatic and Manual Measurement", etc.
- On planned activities and subcommittee activities for FY 2018
  On EMI Techniques for Measurement Above 1 GHz (revised), EMI Measurement Instrumentation Uncertainty, etc.

Hiroaki Suzuki (Casio Computer Co., Ltd.) gave a report on the Market Sampling Test Subcommittee:

- On VCCI's own standards and market sampling tests
- Activity report for FY 2017
  Sampling tests: 100 products were tested, of which 97 passed and 3 failed.
  Documents inspection: 40 inspections, of which 2 required re-testing
  Survey on the display of the VCCI Mark: 1,600 products were tested, and companies that displayed the VCCI Mark inappropriately on their products were asked to make corrections.
- Planned activities for FY 2018, introduction of subcommittee members

Kazuyuki Hori (Sony Corporation) gave a report on the International Relations Subcommittee:

- On the role and activity policy of the International Relations Subcommittee, and the content of its activities in FY 2017
  Database of information on the main overseas EMC standards in FY 2017 (25 countries and regions)

Database of information on adoption of the latest EMC standards for information devices (20 items from 5 countries and regions)

- On the 2017 international forum
  VIPs were invited from the EU, Taiwan, and various gulf countries to hear a lecture on the latest trends in EMC standards.
- Planned activities for FY 2018, introduction of subcommittee members

Shinji Kuroda (Hitachi Information and Telecommunication Engineering, Ltd.) gave a report on the Public Relations Subcommittee:

- On the content of activities in FY 2017
  The organization newsletter (VCCI Dayori Issues 125 - 128) was issued. Ads were placed on electric signboards in the JR Akihabara Station and Osaka Station, ad stickers were placed on door windows in the Hibiya Line (train cars running on Tobu Railway), and promotional footage was used on TV screens in Bic Camera sales floors.
  VCCI EMI standards sheets (calendars) were made for distribution, and reports made on the VCCI exhibitions at COMPUTEX TAIPEI 2017, TECHNO FRONTIER 2017, and CEATEC 2017. An introductory video was posted on the VCCI website.
- Planned activities for FY 2018, introduction of subcommittee members

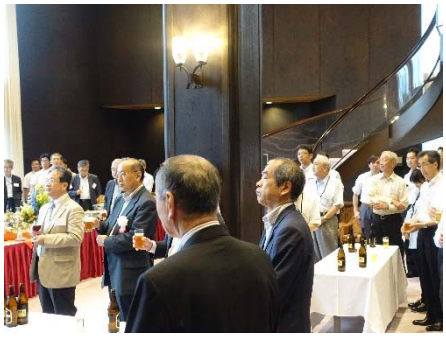
Finally, Koichi Ogawa, Senior Researcher at the Policy Alternatives Research Institute, The University of Tokyo and advisor to the independent administrative agency NEDO (New Energy and Industrial Technology Development Organization), gave a special lecture entitled " Directing Japanese enterprises in the age of IoT. From craftsmanship and salesmanship to value formation through the use and application of data" on the historical background leading to our "open and closed" business strategy, and on VCCI's future approach.


Greeting from President Kawakami

Business Report Meeting (1)

Business Report Meeting (2)

Special lecture by Koichi Ogawa



Exchange conference after the Business Report Meeting (1)

Exchange conference after the Business Report Meeting (2)

# Report on the VCCI Seminar

VCCI Secretariat

- Date and time : July 13, 2018 (Fri) 13:30 - 16:30
- Venue : Oita Industrial Research Institute, Training Room 1
- Number of applicants : 17
- Topics and lecturers

| | |
|---|---|
| - Introduction to VCCI activities and future trends in EMC standards | Akira Oda, Senior Managing Director of VCCI |
| - On international standards for multimedia devices (CISPR 32)<br>What is CISPR 32?<br>Main differences between CISPR 32 Editions 1 and 2<br>Main differences between international standards and domestic reports | Minoru Hirahara, Chairman of the Technical Subcommittee (Fujitsu Ltd.) |
| - Overview of the VCCI technical training business and notes on measurement methods<br>"GUIDE ON PREPARING TEST REPORT (For VCCI-CISPR 32)"<br>Improving on EMI measurement techniques<br>EMI measurement instrumentation uncertainty | Shinichi Okuyama, Chairman of the Education Subcommittee (NEC Platforms, Ltd.) |

- The latest VCCI seminar was held at the request of the Oita Industrial Research Institute.
  VCCI has been holding technical seminars on its activities and EMC relating to each prefecture's industry sensors since 2006, and plans to continue doing so with consideration to requests from each region. We would like to take this opportunity to thank all parties involved with the Oita Industrial Research Institute.

# Status on FY2018 Market Sampling Tests

Market Sampling Test Subcommittee

As of July 31, 2018

| Planned number of Market Sampling Tests | Loan-based | 45 | 100 |
|---|---|---|---|
| | Purchase-based | 55 | |

| Sampling test Grand total | Selected | Cancelled (unrealized shipment, etc.) | Owner's consent pending | Testable samples | Test completed | Judgment awaited | Judgment | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Passed | Failed - tentative | | |
| | | | | | | | | Finally passed | Finally failed | Pending |
| **Grand total** | 42 | 1 | 6 | 35 | 15 | 12 | 3 | - | - | - |
| **Previous month grand total** | - | - | - | - | - | - | - | - | - | - |
| **Loan-based testing total** | 24 | 1 | 6 | 17 | 6 | 3 | 3 | - | - | - |
| 1st Quarter | 12 | 1 | - | 11 | 6 | 3 | 3 | - | - | - |
| 2nd Quarter | 12 | - | 6 | 6 | - | - | - | - | - | - |
| 3rd Quarter | - | - | - | - | - | - | - | - | - | - |
| 4th Quarter | - | - | - | - | - | - | - | - | - | - |
| **Purchase-based testing total** | 18 | - | - | 18 | 9 | 9 | - | - | - | - |
| 1st Quarter | 18 | - | - | 18 | 9 | 9 | - | - | - | - |
| 2nd Quarter | - | - | - | - | - | - | - | - | - | - |
| 3rd Quarter | - | - | - | - | - | - | - | - | - | - |
| 4th Quarter | - | - | - | - | - | - | - | - | - | - |

Final Result

| Passed | Failed | Pending |
|---|---|---|
| 3 | - | - |

.

| Document inspection | Selected | Cancelled (withdrawal, etc.) | Owner's consent pending | Inspectable samples | Pre-check completed | Judgment awaited | Judgment completed | Judgment | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Cleared | Problems identified |
| | 15 | | - | 15 | 3 | 4 | 8 | 8 | 0 |

# Secretariat Dayori

## ● VCCI Membership Registry (May - July 2018)

### New Members

| Membership | Member No. | Company Name | Country |
|---|---|---|---|
| Regular | 3907 | inMusic Japan K.K. | JAPAN |
| Regular | 3909 | Sangikyo Corporation | JAPAN |
| Regular | 3910 | Canare Electric Co., Ltd. | JAPAN |
| Regular | 3915 | Advance Connecting Technologies | JAPAN |
| Regular | 3817 | Fibar Group. S.A. | POLAND |
| Regular | 3878 | PixMob | CANADA |
| Regular | 3880 | SolarEdge Technologies Ltd. | ISRAEL |
| Regular | 3888 | Rein Medical GmbH | GERMANY |
| Regular | 3894 | Accelink Technologies Co., Ltd. | CHINA |
| Regular | 3899 | Light Blue Optics Limited | U.K. |
| Regular | 3900 | Xiamen Intretech Inc. | CHINA |
| Regular | 3901 | Telestream, LLC | USA |
| Regular | 3903 | ZIONCOM ELECTRONICS (SHENZHEN) LTD. | CHINA |
| Regular | 3904 | DAEJIN DMP CO., LTD | KOREA |
| Regular | 3904 | DAEJIN DMP CO., LTD | KOREA |
| Regular | 3905 | Gosuncn Technology Group Co., Ltd. | CHINA |
| Regular | 3906 | Knectek Labs Inc. | CANADA |
| Regular | 3908 | Corero Network Security Inc. | USA |
| Regular | 3911 | Astro HQ LLC | USA |
| Regular | 3913 | Owl Cyber Defense Solutions, LLC | USA |
| Regular | 3914 | SUMIT Co., Ltd. | KOREA |
| Regular | 3916 | ORION Co., LTD | KOREA |
| Regular | 3917 | DriveScale, Inc. | USA |
| Regular | 3918 | VEXATA, INC. | USA |
| Regular | 3919 | LINE INCORPORATION LTD. | BERGIUM |
| Membership | 3898 | Intertek ETL SEMKO Korea Ltd. | KOREA |

## Change of Company Name

| Membership | Member No. | Company Name | Country | Former Company Name |
|---|---|---|---|---|
| Regular | 5 | SORD CORPORATION | JAPAN | Toshiba Platform Solution Corporation |
| Membership | 352 | Nagano Prefectural General Industrial Technology Center Precision. Electronics & Aviation Technology Department | JAPAN | Nagano Prefectural General Industrial Technology Center Precision and Electronics Technology Department |
| Regular | 1558 | Ribbon Communications Inc. | USA | Sonus Networks, Inc. |
| Regular | 3229 | Champ Vision Display Inc. | CHINESE TAIPEI | YOUNG Lighting Technology Inc. |
| Regular | 3372 | Hitachi Vantara | U.K. | Hitachi Data Systems Corporation |
| Regular | 3421 | Ingenico Inc. | USA | ROAM Data Inc. |
| Membership | 1062 | Eurofins York | U.K. | York EMC Services, Grangemouth |

Request : In case of any change in your company name, please kindly advise VCCI.
Use the “Notice of Change” at VCCI Website.

## Withdrawal Members

| Membership | Member No. | Company Name | Country |
|---|---|---|---|
| Regular | 292 | SEKISUI CHEMICAL CO., LTD. | JAPAN |
| Regular | 758 | ITO ELECTRONIC INDUSTRY CO., LTD. | JAPAN |
| Regular | 3316 | HOYA CORPORATION PENTAX Life Care Division | JAPAN |
| Regular | 3225 | Guillemot Corporation S.A | FRANCE |
| Regular | 3408 | TECO Image Systems Co., Ltd. | CHINESE TAIPEI |
| Regular | 3745 | Innowireless Co., Ltd. | KOREA |
| Regular | 3869 | Reach Robotics Ltd. | U.K. |

## ● VCCI Schedule for FY 2018

**April**
- Exhibition at TECHNO FRONTIER

**May**
- Measurement engineer course “The basic technique of EMI measurement”

**June**
- Exhibition at COMPUTEX TAIPEI
- Measurement engineer course “The basic of electromagnetic waves, EMI measurement technique below 1 GHz”
- Release VCCI Dayori No.129

**July**
- VCCI Business Reporting Meeting
- Release Annual Report

**August**

**September**
- Release VCCI Dayori No.130

**October**
- Exhibition at CEATEC JAPAN
- VCCI International Forum
- Measurement engineer course “The basic technique of EMI measurement”

**November**
- Measurement engineer course “The basic of electromagnetic waves, EMI measurement technique below 1 GHz”
- Measurement engineer course “The EMI measurement technique above 1 GHz”

**December**
- Measurement engineer course “The level up of EMI measurement technique”
- Release VCCI Dayori No.131

**January**
- VCCI Technical Symposium

**February**
- Measurement engineer course “The uncertainty of EMI Measurement Instrumentation”

**March**
- Release VCCI Dayori No.132

## ● Status of Compliance Test Notifications （V-2+VCCI 32-1）

## （April 2018 ～ June 2018）

| | | | | | April 2018 | | | May 2018 | | | June 2018 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Class A | Class B | Class A | Class B | Total | Class A | Class B | Total | Class A | Class B | Total |
| Computer | Server | Super Computer, Server, etc. | A 2 | a 2 | 19 | 1 | 20 | 25 | 0 | 25 | 16 | 0 | 16 |
| | Tabletop type | WS, Desk-top PCs, etc. | B 2 | b 2 | 0 | 25 | 25 | 2 | 44 | 46 | 0 | 4 | 4 |
| | Portable type | Note PCs, Tablet PCs, etc. | C 2 | c 2 | 0 | 26 | 26 | 0 | 23 | 23 | 0 | 15 | 15 |
| | Others | Office Computer, Wearable computers, etc. | E 2 | e 2 | 2 | 1 | 3 | 3 | 5 | 8 | 0 | 0 | 0 |
| Peripherals/Terminals Equipment | Storage Device | HDD, SSD, USB Memory, Media drives, etc.<br>Disk drives, NAS, DAS, SAN, etc. | G 2 | g 2 | 9 | 35 | 44 | 8 | 34 | 42 | 3 | 4 | 7 |
| | Printer | Printer (Compound equipment included), etc. | H 2 | h 2 | 11 | 19 | 30 | 7 | 5 | 12 | 1 | 0 | 1 |
| | Display | CRT displays, Monitor, projector, etc. | J 2 | j 2 | 1 | 37 | 38 | 9 | 56 | 65 | 1 | 18 | 19 |
| | Input/Output Device （excluding Auxiliary Memory, Printer, Display） | Image scanners, OCR, etc. | M 2 | m 2 | 5 | 15 | 20 | 4 | 11 | 15 | 0 | 0 | 0 |
| | General Purpose Terminal | Display control terminals, etc. | N 2 | n 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Exclusive Terminal | POS, Terminal for Financial and Insurance use, etc. | Q 2 | q 2 | 7 | 0 | 7 | 7 | 0 | 7 | 3 | 0 | 3 |
| | Other Peripherals Equipment | Others (PCI cards, Graphics cards, Mouse, Keyboard, etc.) | R 2 | r 2 | 11 | 45 | 56 | 13 | 31 | 44 | 0 | 6 | 6 |
| Audio visual equipment | Broadcast receivers | Television, Radio, Tuner, Video recorder, Set-top Boxes, etc. | K 2 | k 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Audio equipment | Speaker, Amplifier, IC recorder, MP3 player, Headsets, etc. | L 2 | l 2 | 0 | 3 | 3 | 0 | 2 | 2 | 0 | 1 | 1 |
| | Video/Camera equipment | Digital video cameras, Web cameras, Network cameras, Video players, Photo frames, Digital-camera, etc. | I 2 | i 2 | 7 | 4 | 11 | 6 | 4 | 10 | 1 | 1 | 2 |
| | Others | Other Audio visual equipment | P 2 | p 2 | 2 | 2 | 4 | 7 | 6 | 13 | 0 | 0 | 0 |
| Copying Machine/ Compound | - | Copying Machine/Compound equipment, etc. | S 2 | s 2 | 0 | 2 | 2 | 1 | 0 | 1 | 0 | 1 | 1 |
| Communications Equipment | Terminal equipment | Mobilephone, Smartphone, PHS telephones | T 2 | t 2 | 0 | 2 | 2 | 0 | 9 | 9 | 0 | 0 | 0 |
| | | Telephone Equipment (PBX, FAX, Key Telephone System, etc.),<br>Cordless telephones | U 2 | u 2 | 0 | 0 | 0 | 2 | 9 | 11 | 0 | 0 | 0 |
| | Network related equipment | Network Channel Terminating Equipment (Modem, Digital Transmission Equipment, DSU, TA, etc.) | V 2 | v 2 | 1 | 7 | 8 | 0 | 1 | 1 | 0 | 0 | 0 |
| | | LAN Equipment (Rooter, HUB, etc.), Switching-node, etc. | W 2 | w 2 | 29 | 8 | 37 | 39 | 13 | 52 | 5 | 1 | 6 |
| | Others | Other Communications Equipment | X 2 | x 2 | 12 | 5 | 17 | 14 | 8 | 22 | 2 | 0 | 2 |
| Entertainment and educational equipment | Electronic stationeries | Electronic dictionaries, Electronic book readers, etc. | D 2 | d 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 4 | 4 |
| | Electronic toys | Game machines, Game pads,<br>Toy drones, etc. | Y 2 | y 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Lighting control equipment for entertainment | Lighting control equipment for entertainment | Z 2 | z 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Others | Others (Navigator, etc.) | F 2 | f 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Others | | | O 2 | o 2 | 7 | 4 | 11 | 8 | 6 | 14 | 0 | 0 | 0 |
| Total | | | | | 123 | 242 | 365 | 155 | 269 | 424 | 32 | 55 | 87 |

## ● Status of Compliance Test Notifications （VCCI 32-1）

## （April 2018 ～ June 2018）

| | | | | | April 2018 | | | May 2018 | | | June 2018 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Class A | Class B | Class A | Class B | Total | Class A | Class B | Total | Class A | Class B | Total |
| Computer | Server | Super Computer, Server, etc. | A 2 | a 2 | 11 | 1 | 12 | 20 | 0 | 20 | 16 | 4 | 20 |
| | Tabletop type | WS, Desk-top PCs, etc. | B 2 | b 2 | 0 | 23 | 23 | 2 | 39 | 41 | 4 | 25 | 29 |
| | Portable type | Note PCs, Tablet PCs, etc. | C 2 | c 2 | 0 | 21 | 21 | 0 | 22 | 22 | 0 | 30 | 30 |
| | Others | Office Computer, Wearable computers, etc. | E 2 | e 2 | 2 | 0 | 2 | 3 | 4 | 7 | 4 | 1 | 5 |
| Peripherals/Terminals Equipment | Storage Device | HDD, SSD, USB Memory, Media drives, etc.<br>Disk drives, NAS, DAS, SAN, etc. | G 2 | g 2 | 7 | 14 | 21 | 4 | 20 | 24 | 7 | 20 | 27 |
| | Printer | Printer (Compound equipment included), etc. | H 2 | h 2 | 4 | 19 | 23 | 1 | 2 | 3 | 4 | 6 | 10 |
| | Display | CRT displays, Monitor, projector, etc. | J 2 | j 2 | 0 | 34 | 34 | 7 | 42 | 49 | 13 | 44 | 57 |
| | Input/Output Device （excluding Auxiliary Memory, Printer, Display） | Image scanners, OCR, etc. | M 2 | m 2 | 2 | 13 | 15 | 3 | 9 | 12 | 1 | 11 | 12 |
| | General Purpose Terminal | Display control terminals, etc. | N 2 | n 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Exclusive Terminal | POS, Terminal for Financial and Insurance use, etc. | Q 2 | q 2 | 6 | 0 | 6 | 2 | 0 | 2 | 8 | 1 | 9 |
| | Other Peripherals Equipment | Others (PCI cards, Graphics cards, Mouse, Keyboard, etc.) | R 2 | r 2 | 9 | 37 | 46 | 10 | 24 | 34 | 9 | 39 | 48 |
| Audio visual equipment | Broadcast receivers | Television, Radio, Tuner, Video recorder, Set-top Boxes, etc. | K 2 | k 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| | Audio equipment | Speaker, Amplifier, IC recorder, MP3 player, Headsets, etc. | L 2 | l 2 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 9 | 9 |
| | Video/Camera equipment | Digital video cameras, Web cameras, Network cameras, Video players, Photo frames, Digital-camera, etc. | I 2 | i 2 | 5 | 1 | 6 | 1 | 4 | 5 | 1 | 2 | 3 |
| | Others | Other Audio visual equipment | P 2 | p 2 | 1 | 2 | 3 | 7 | 5 | 12 | 1 | 1 | 2 |
| Copying Machine/ Compound | - | Copying Machine/Compound equipment, etc. | S 2 | s 2 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 2 |
| Communications Equipment | Terminal equipment | Mobilephone, Smartphone, PHS telephones | T 2 | t 2 | 0 | 2 | 2 | 0 | 8 | 8 | 0 | 0 | 0 |
| | | Telephone Equipment (PBX, FAX, Key Telephone System, etc.), Cordless telephones | U 2 | u 2 | 0 | 0 | 0 | 2 | 9 | 11 | 4 | 1 | 5 |
| | Network related equipment | Network Channel Terminating Equipment (Modem, Digital Transmission Equipment, DSU, TA, etc.) | V 2 | v 2 | 0 | 7 | 7 | 0 | 1 | 1 | 1 | 0 | 1 |
| | | LAN Equipment (Rooter, HUB, etc.), Switching-node, etc. | W 2 | w 2 | 10 | 3 | 13 | 22 | 10 | 32 | 12 | 7 | 19 |
| | Others | Other Communications Equipment | X 2 | x 2 | 7 | 3 | 10 | 5 | 8 | 13 | 13 | 2 | 15 |
| Entertainment and educational equipment | Electronic stationeries | Electronic dictionaries, Electronic book readers, etc. | D 2 | d 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| | Electronic toys | Game machines, Game pads, Toy drones, etc. | Y 2 | y 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 4 | 4 |
| | Lighting control equipment for entertainment | Lighting control equipment for entertainment | Z 2 | z 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Others | Others (Navigator, etc.) | F 2 | f 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Others | | | O 2 | o 2 | 6 | 2 | 8 | 4 | 6 | 10 | 5 | 2 | 7 |
| Total | | | | | 70 | 184 | 254 | 94 | 215 | 309 | 104 | 211 | 315 |

## ● Registration Status of Measurement and Other Facilities

The following table indicates the status on registration of measuring facilities in the most recent three months.

Facilities listed here are only those made open by registering members in principle. Members with those facilities whose valid period expired are kindly advised to contact VCCI to inform of the status they are in. Status to choose from are, renewal application being filed, new application being filed, waiting for the next issue to carry, or terminating the registration (all facilities are posted in the Web site).

Facilities in Japan are listed in Japanese.

### List of newly registered or renewed facilities (April 2018 – June 2018)

R: Field strength measuring facility C: Mains Port Conducted interference measuring facility T: Communication Port

Conducted interference measuring facility G: Radiated EMI measurement facilities above 1GHz

| Company name | Equipment name | 3 m | 10 m | 30 m | Dark 3m | Dark 10m | Registration number | Effective date | Location | Contact to: |
|---|---|---|---|---|---|---|---|---|---|---|
| DT&C Co., Ltd. | 10 m #3 Semi-anechoic chamber | - | - | - | - | ○ | R-4496 | 2021/4/22 | 42, Yurim-ro 154 beon-gil, Cheoin-Gu, Yongin-Si, Gyeonggi-Do, Korea 17042 | 82-31-321-2664 |
| Bay Area Compliance Laboratories Corp. (Taiwan) | Conduction Room | - | - | - | - | - | T-20026 | 2021/4/22 | 70, Lane 169, Sec. 2, Datong Road,Xizhi Dist., New Taipei City 22183, Taiwan, R.O.C. | 02-2647 6898 |
| Standard Bank Co., Ltd. | Standard Bank Co., Ltd | - | - | - | - | - | T-20025 | 2021/4/22 | 48, Gunpocheomdansaneop 2-ro, Gunpo-si, Gyeonggi-do, Republic of Korea | +82-31-393-9394 |
| Standard Bank Co., Ltd. | Standard Bank Co., Ltd | - | - | - | - | - | G-20043 | 2021/4/22 | 48, Gunpocheomdansaneop 2-ro, Gunpo-si, Gyeonggi-do, Republic of Korea | +82-31-393-9394 |
| Shenzhen Huaxia Testing Technology Co., Ltd. | Shenzhen Huaxia Testing Technology Co., Ltd | - | - | - | - | - | C-20026 | 2021/4/22 | 1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China | "+86-755-26648642 |
| I.T.L. (PRODUCT TESTING) LTD | EMC Laboratory, Telrad Industrial Park | - | - | - | - | - | C-20025 | 2021/4/22 | 1 Batsheva St., Lod, Israel | 972-8-915-3100 |
| Wendell Industrial Co., Ltd. | Wendell Electrical Testing Laboratory | - | - | - | - | - | G-20039 | 2021/4/22 | No.67-9, Shimen Rd., Tucheng Dist., New Taipei City 236, Taiwan (R.O.C.) | +886-2263-1839#319 |
| Wendell Industrial Co., Ltd. | Wendell Electrical Testing Laboratory(W06) | - | - | - | - | - | C-20027 | 2021/4/22 | No.67-9, Shimen Rd., Tucheng Dist., New Taipei City 236, Taiwan (R.O.C.) | +886-2263-1839 |
| Wendell Industrial Co., Ltd. | Wendell Electrical Testing Laboratory(W03) | - | - | - | - | - | G-20040 | 2021/4/22 | No.38-20,Mujiliao,Sanzhi Dist., New Taipei City 252, Taiwan (R.O.C.) | +886-2917-5770#309 |
| Wendell Industrial Co., Ltd. | Wendell Electrical Testing Laboratory(W03) | ○ | ○ | - | - | - | R-20028 | 2021/4/22 | No.38-20,Mujiliao,Sanzhi Dist., New Taipei City 252, Taiwan (R.O.C.) | +886-2917-5770#309 |

| Company name | Equipment name | 3 m | 10 m | 30 m | Dark 3m | Dark 10m | Registration number | Effective date | Location | Contact to: |
|---|---|---|---|---|---|---|---|---|---|---|
| BV 7Layers Communications Technology (Shenzhen) Co., Ltd. | 3m semi-anechoic Chamber | - | - | - | ○ | - | R-20026 | 2021/4/22 | No.B102,Dazu Chuangxin Mansion, North of Beihuan Avenue, North Area, Hi-Tech Industry Park, Nanshan District, Shenzhen, Guangdong, China | +86755-88696548 |
| MRT Technology (Suzhou) Co., Ltd. | AC 1 | - | - | - | ○ | - | R-20025 | 2021/4/22 | D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China | +86-512-66308358 |
| DEKRA Testing and Certification Co., Ltd. | CB1-H | - | - | - | - | ○ | R-20034 | 2021/4/22 | No.372, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 310, Taiwan 31061,R.O.C. | +886-3-582-8001 |
| BTL Inc. | SH-CB08 | - | - | - | - | - | G-20041 | 2021/4/22 | No.29,Jintang Road,Tangzhen Industry Park,Pudong New Area,Shanghai,China | +86-21-6176 5666 ext 111 |
| BTL Inc. | SH-CB01 | - | - | - | - | - | G-20042 | 2021/4/22 | No.29,Jintang Road,Tangzhen Industry Park,Pudong New Area,Shanghai,China | +86 21 6176 5666 ext 111 |
| BTL Inc. | SH-C01 | - | - | - | - | - | C-20029 | 2021/4/22 | No.29,Jintang Road,Tangzhen Industry Park,Pudong New Area,Shanghai,China | +86 21 6176 5666 ext 111 |
| BTL Inc. | SH-C01 | - | - | - | - | - | T-20030 | 2021/4/22 | No.29,Jintang Road,Tangzhen Industry Park,Pudong New Area,Shanghai,China | +86 21 6176 5666 ext 111 |
| BTL Inc. | SH-CB01 | - | - | - | ○ | - | R-20031 | 2021/4/22 | No.29,Jintang Road,Tangzhen Industry Park,Pudong New Area,Shanghai,China | +86 21 6176 5666 ext 111 |
| BTL Inc. | SH-CB08 | - | - | - | - | ○ | R-20029 | 2021/4/22 | No.29,Jintang Road,Tangzhen Industry Park,Pudong New Area,Shanghai,China | +86 21 6176 5666 ext 111 |
| Compliance Certification Services Inc. | CCS Xindian Chamber#E | - | - | - | ○ | - | R-20030 | 2021/4/22 | No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City 23151, Taiwan | +886-2-22170894 |
| Underwriters Laboratories Taiwan Co., Ltd. | C-1 | - | - | - | - | - | C-20028 | 2021/4/22 | Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan | +886-228967790 |
| Underwriters Laboratories Taiwan Co., Ltd. | CT-1 | - | - | - | - | - | T-20029 | 2021/4/22 | Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan | +886-228967790 |

| Company name | Equipment name | 3 m | 10 m | 30 m | Dark 3m | Dark 10m | Registration number | Effective date | Location | Contact to: |
|---|---|---|---|---|---|---|---|---|---|---|
| Underwriters Laboratories Taiwan Co., Ltd. | 966-2_H | - | - | - | ○ | - | R-20032 | 2021/4/22 | Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan | +886-228967790 |
| Underwriters Laboratories Taiwan Co., Ltd. | 966-1_H | - | - | - | ○ | - | R-20033 | 2021/4/22 | Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan | +886-228967790 |
| Underwriters Laboratories Taiwan Co., Ltd. | 966-2 | - | - | - | - | - | G-20045 | 2021/5/20 | Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan | +886-228967790 |
| Underwriters Laboratories Taiwan Co., Ltd. | 966-1 | - | - | - | - | - | G-20044 | 2021/5/20 | Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan | +886-228967790 |
| DEKRA Testing and Certification Co., Ltd. | CB1-H | - | - | - | - | - | G-20046 | 2021/5/20 | No.372, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 310, Taiwan 31061,R.O.C. | +886-3-582-8001 |
| MRT Technology (Suzhou) Co., Ltd. | SR2 | - | - | - | - | - | T-20020 | 2021/5/20 | D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China | +86-512-66308358 |
| I.T.L. (PRODUCT TESTING) LTD | EMC Laboratory, Telrad Industrial Park | - | - | - | - | - | T-20028 | 2021/5/20 | 1 Batsheva St., Lod, Israel | 972-8-915-3100 |
| オリンパス株式会社 | シールドルーム No.2 | - | - | - | - | - | C-20030 | 2021/5/20 | 東京都八王子市石川町 2951 | 042-642-6613 |
| オリンパス株式会社 | 電波暗室 No.5 | - | - | - | - | ○ | R-20041 | 2021/5/20 | 東京都八王子市石川町 2951 | 042-642-6613 |
| Shenzhen Huaxia Testing Technology Co., Ltd. | Shenzhen Huaxia Testing Technology Co., Ltd | - | - | - | ○ | - | R-20043 | 2021/5/20 | 1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China | +86-755-26648642 |
| 日本 NCR 株式会社 | NCR WHQ EMC Conducted Telecom | - | - | - | - | - | T-20031 | 2021/5/20 | 864 Spring Street NW, Atlanta, GA 30308, USA | +17704952825 |
| 日本 NCR 株式会社 | NCR WHQ EMC Conducted AC Mains | - | - | - | - | - | C-20031 | 2021/5/20 | 864 Spring Street NW, Atlanta, GA 30308, USA | +17704952825 |
| DT&C Co., Ltd. | Dt&C Co.,Ltd. | - | - | - | - | - | G-20051 | 2021/6/17 | 42 , Yurim-ro 154 beon-gil, Cheoin-Gu, Yongin-Si, Gyeonggi-Do, Korea | 82-31-321-2664 |
| 福島県ハイテクプラザ | 電波暗室 | - | - | - | - | - | C-20032 | 2021/6/17 | 福島県郡山市待池台 1-12 | 024-959-1738 |
| KOSTEC Co., Ltd. | Semi-anechoic Chamber | - | - | - | - | ○ | R-14202 | 2021/6/17 | 28 406-gil,Sejaro, Hwaseong-si,Gyeonggi-do, Korea | +82-31-222-4251 |

## Before putting down a pen

Will we begin to reflect more and more upon the Heisei era due to end six months from now? Whatever the answer, that date marks the close of one age and the start of another. I find myself in a future I'd only once imagined. Yet, what we always typically expected from the future - the TV phone and the helper robot - have melded into our reality in such everyday, not-so-futuristic forms as Skype and Roomba.

That future of our fantasies, where cars fly in the sky, flitting through the gaps between skyscrapers, is not due for a long time yet. It seems we won't even be able to make our deteriorating expressways shine in time for the Olympics. Compared to the future people imagined 30 years ago, you could say our world of 2018 looks rather boring. Which means, the age after Heisei is likely to not look so different at a glance, either.

However, through the permeation of technology, people's behavioral patterns and state of mind will surely change, slowly but surely. I've recently been addicted to mountaineering, and this year I went trekking in Nepal. It may sound like a great adventure, but the air tickets and guest house lodgings were all booked online, and I'd been able to make plans with my local mountaineering guide before leaving Japan - entirely through email. This coupled with my lightweight, enhanced-functionality mountaineering gear allowed even a beginner like myself to enjoy trekking in a foreign country with astonishing ease. That level of ease was surely unthinkable 30 years ago.

Only a little while ago, it felt a little creepy being in town and seeing people making phone calls with their earphones in, not even looking at their screens, but I notice that it feels normal now. Lately, I think the future will be a culmination of such small changes, accumulating one after another. That's why it's so difficult to predict the future. It's also easy to get pessimistic about the next 30 years in light of our social conditions. However, as a minor player working in the field of technology, I can't help musing about the not-too-shiny, but surely fun future that will come.

(T.I.)

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