VCCI DAYORI

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Contents

Contribution

My Experience with Standardization Activities at ITU-T

Mitsuo Hattori

My first brush with standardization work was around 1980. To propose a method of predicting the voltage induced on communication lines from medium-wave broadcast waves, I measured electric field strength and induced voltage and submitted my work as a contribution to CCITT (currently: ITU-T, hereinafter "ITU-T"). Later, in 1991, I attended my first international standardization meeting in Geneva. At the time, IT environments still had computers that were too heavy to carry around, and data transmission was unavailable.

The conference room at the ITU-T head office has also changed a lot since then. When I first attended, all documents were distributed in paper form. For this reason, attendees each had their own pigeonhole outside the conference room, where temporary reference documents updated with the results of each meeting would be distributed as needed. Every coffee break, I'd check my numbered pigeonhole for the latest documents to take to my next meeting. After all these meetings, I'd end up with a stack of papers as thick as a binder, weighing down my bag so much the belt would dig into my shoulder as I traveled to and from the hotel.

In those days, we could only communicate by landline, so there was a row of at least ten phone booths in a corner of the ITU-T conference-room floor. To make calls, committee members attending meetings would have to file an application form containing their company contact number at the reception counter, and be assigned a booth number. This system was convenient because international calls were very expensive back then, and not feasible for individuals outside extraordinary circumstances. This would be utterly unimaginable in our current IT environment.

Meanwhile, the issues faced by ITU-T have changed dramatically. When I started participating in standardization, the main issues were electromagnetic induction and overvoltage protection. Electromagnetic induction from power lines or electric railways to communication lines could cause high voltages in commercial frequencies, endangering workers and creating audible noise in analog phones. Overvoltage protection involved preventing direct or conducted lightning damage to telecommunication equipment. One particular topic, mainly being discussed in Europe, is a proposal to relax the allowable value of induced voltages from power lines from the existing 630 V to 2,000 V. ITU-T has also been discussing proposed changes to the limit values. In Japan, there has been discussion on whether 2,000 V is allowable under high temperature and humidity conditions. As a result of experiments and theoretical examinations by power companies and NTT, it was agreed upon to relax the allowable value to 630 V only for highly stable power transmission lines whose interception time is 0.06 seconds or less. Japan's agreed-upon condition was also included in an ITU-T Recommendation as a limit value for harsh environments. To achieve this result, however, Japan's claims first had to be acknowledged over the course of several rapporteur meetings in addition to formal meetings, where supporting data was presented. During this time, I recall going on business trips to countries such as Hungary, which was in the Communist bloc at the time, constantly having discussions while surrounded by European members. The daytime discussions revolved around documents; the nighttime discussions involved generous offers of booze - more than I could handle!

After that, a major EMC-related development was the issuing of the EMC Directive by the EU's predecessor, the EEC, in 1989, making EMC standardization mandatory in Europe. Just prior to this, VCCI had been established in 1985, and Japan was preparing to enforce standardization at a rapid pace. When regulations came into effect, products exported to the EU would require EMC compliance, creating the need to secure measurement facilities such as anechoic chambers for product testing. This led to a boom in activity among academic conferences and those involved in standardization. Also, European countries would have to harmonize the EU's adopted standard (European Norm) to the international standard, and the IEC standard lacked certain regulations such as those for large telecommunication equipment at telephone companies. For this reason, there was a flurry of discussion at ITU aimed at publishing difficult-to-adapt aspects as ITU Recommendations. I believe that Japan was able to exert its presence here, too, by presenting proposals and engaging in discussions backed up by data.

Since the wide proliferation of cell phone use, there has been growing interest in the effects of electromagnetic waves on the human body, and organizations such as WHO have started to tackle this problem. Even now, there is great interest in the exposure of the human body to electromagnetic fields (EMF). This will be an important challenge for ITU-T, considering that countries have different domestic regulations on such matters.

As you can see, the environment surrounding EMC standardization activities and the issues being tackled are changing. To win the trust of our members in other participating countries, I believe it is of utmost importance to establish a technical backbone consisting of experimental data and a theoretical foundation on which to base discussions. I also believe in the importance of continuing to hold these discussions in the future.

Prof. of Engineering Mitsuo Hattori

1975 Graduated from the Faculty of Engineering, Nagoya Institute of Technology
Joined the Nippon Telegraph and Telephone Public Corporation (NTT)
Engaged in R&D relating to electromagnetic induction measures, EMC measures for telecommunications systems, measures against lightning damage, and grounding
2003 Joined NTT Advanced Technology Corporation
2023 Retired

Work relating to international standardization:
1991 onward Attended meetings as a CCITT (currently: ITU-T) committee member
2000 to 2016 Served as Chair of ITU-T SG5 WP2
2015 onward Participated as an expert in IEC TC108 HBSDT

Committee Activities

●Board

Date	March 29, 2024
Agenda items	● Agenda item 1 FY 2024 business plan (draft) ● Agenda item 2 FY 2024 budget (draft)
Decisions and reported items	● Agenda item 1 Approved ● Agenda item 2 Approved ● Reported item 1 Revised fees for examining measurement facilities (draft)

●Steering Committee

Date	January 17, February 21, and March 26, 2024
Agenda items	● Agenda item 1 FY 2024 budget (draft) ● Agenda item 2 FY 2024 business plan (draft)
Decisions and reported items	● Agenda item 1 Approved ● Agenda item 2 Approved ● Reported item 1 Holding of the 2024 Technical Symposium ● Reported item 2 Schedule for EMC Japan/APEMC Okinawa ● Reported item 3 Holding of a VCCI seminar at Tokatsu Techno Plaza (see page 21) ● Reported item 4 Activity reports for the period from January to March were made by the dedicated subcommittees (Technical, International Relations, Market Sampling Test, Public Relations, Education). ● Reported item 5 Status report regarding secretariat work (member entry and withdrawal trends, the number of compliance verification reports, income and expenditure, etc.)

●Technical Subcommittee

Date	January 18 and March 13, 2024
Agenda items	● Agenda item 1 Technical Subcommittee's planned activities for FY 2024 ● Agenda item 2 Creation of guidance documents on measurement uncertainty when using hybrid antennas ● Agenda item 3 Assessment of whether EUT impedance affects the voltage/current conversion ratio relating to transformer-type AANs during conducted emissions ● Agenda item 4 Activities to standardize power cable termination conditions ● Agenda item 5 Guidance on radiated emission measurements conducted when an EUT power cable is terminated by balanced VHF-LISN ● Agenda item 6 VCCI tutorial held at EMC Japan/APEMC Okinawa
Continuing agenda items	● Agenda items 1, 2, 3, 4, 5, and 6
Decisions and reported items	● Reported item 1 Report on 2024 Technical Symposium (see page 19)

●International Relations Subcommittee

Date	January 10, February 15, and March 13, 2024
Agenda items	● Agenda item 1 Survey of Trends in World EMC Regulations ● Agenda item 2 Preparation for the 2024 International Forum ● Agenda item 3 Summary of the 2024 International Forum Q&A session, and Dayori manuscript check
Continuing agenda items	● Agenda items 1 and 2
Decisions and reported items	● Reported item 1 February-15 update to the website's Survey of Trends in World EMC Regulations ● Reported item 2 Report on the 2024 VCCI International Forum (see page 22)

●Market Sampling Test Subcommittee

Date	January 11, February 8, and March 15, 2024
Agenda items	● Agenda item 1 Market sampling test report ● Agenda item 2 Document inspection report ● Agenda item 3 Budget draft for planned activities for FY 2024 ● Agenda item 4 Report on the survey of the display of the VCCI mark
Decisions and reported items	● Agenda item 1 100 products to be purchased and borrowed for FY 2023 sampling tests were selected and tested. The results found two new failed products, which are being investigated by the applicable members. Additionally, a member reported that their investigation of one failed product in the third quarter resulted in an admission of failure, and the product was deemed to have failed. ● Agenda item 2 43 products were selected for the FY 2023 document inspections. Excluding cancellations, 40 products were confirmed, for which all inspections were completed. ● Agenda item 3 Approved ● Agenda item 4 Secondary survey results were reported for unregistered products identified in the primary survey on the display of the VCCI mark.

●Public Relations Subcommittee

Date	January 12 and March 15, 2024
Agenda items	● Agenda item 1 Vision for Regional Cities ● Agenda item 2 Re-re-revision to the FY 2024 activity plan and budget proposal ● Agenda item 3 History (chronology) of VCCI panel ● Agenda item 4 COMPUTEX TAIPEI 2024
Continuing agenda items	● Agenda item 3 The FY 2024 activity plan proposes creating a new "history (chronology) of VCCI Council" panel for the exhibition, in anticipation of VCCI's 40th anniversary in 2025. ● Agenda item 4 Secretariat report on matters such as the draft booth design for the COMPUTEX TAIPEI 2024 exhibition held from June 4 to 7
Decisions and reported items	● Reported item 1 VCCI Council's 30-second PR video will be shown for one month at Kumamoto COCOSA VISION in January, and for one week at Hiroshima Motomachi Credo Vision in February. From March 24th, the video is planned to be shown at Fukushima ATi VISION for two weeks. ● Reported item 2 The secretariat explained the re-re-revision of the FY 2024 budget proposal, and the proposed corrections were approved.

●Education Subcommittee

Date	January 19 and March 14, 2024
Agenda items	● Agenda item 1 Status of preparations for FY 2023 education and training ● Agenda item 2 Confirmation of TF (task force) progress in FY 2023 ● Agenda item 3 Results of FY 2023 education and training ● Agenda item 4 Drafting an FY 2024 activity plan
Continuing agenda items	● Agenda item 4
Decisions and reported items	● Agenda item 1 – All FY 2023 education and training classes were completed according to plan. ● Agenda item 2 – Of the three TFs, the remaining TF 2 (for the enhancement of calculation exercises and explanations for EMI measurement instrumentation uncertainty (MIU)) completed their preparations for the upcoming education and training events. ● Agenda item 3 – "The level up of the EMI measurement technique" was held online (live streaming) on January 26. All 9 attendees received attendance certificates. – "The EMI measurement instrumentation uncertainty (MIU)" was held in face-to-face format from February 1 to 2. All 15 attendees received attendance certificates. ● Agenda item 4 – The event schedule for the first half of FY 2024 was published on the VCCI website. – "The basic technique of EMI measurement (to be held on June 7)" and "The basic of electromagnetic waves, EMI measurement technique (to be held from July 4 to 5 and July 11 to 12 (JQA))" are now accepting attendance applications.

●Registration Committee for Measurement Facilities

Date	January 22, 2024
Agenda items	● Reviewed the results of deliberations by the Measurement Facility Examination WG.
Decisions and reported items	Conformity certified (including cases certified with qualification comments after checking of supplementary papers): 14 companies Radiated emission measurement facilities below 1 GHz: 9 AC-mains-ports-conducted emission measurement facilities: 14 Wired-telecommunication-port-conducted emission measurement facilities: 7 Radiated emission measurement facilities above 1 GHz: 10 Applications returned with comments: None Applications carried over to the next meeting: None
Date	February 19, 2024
Agenda items	● Reviewed the results of deliberations by the Measurement Facility Examination WG.
Decisions and reported items	Conformity certified (including cases certified with qualification comments after checking of supplementary papers): 21 companies Radiated emission measurement facilities below 1 GHz: 20 AC-mains-ports-conducted emission measurement facilities: 13 Wired-telecommunication-port-conducted emission measurement facilities: 14 Radiated emission measurement facilities above 1 GHz: 7 Applications returned with comments: None Applications carried over to the next meeting: 1
Date	March 18, 2024
Agenda items	● Reviewed the results of deliberations by the Measurement Facility Examination WG.
Decisions and reported items	Conformity certified (including cases certified with qualification comments after checking of supplementary papers): 26 companies Radiated emission measurement facilities below 1 GHz: 13 AC-mains-ports-conducted emission measurement facilities: 13 Wired-telecommunication-port-conducted emission measurement facilities: 12 Radiated emission measurement facilities above 1 GHz: 16 Applications returned with comments: None Applications carried over to the next meeting: None

A Brief History of the Research of Masamitsu Tokuda, Serial Contributor to VCCI Dayori (Part 2)

My research on optical fiber cable

Masamitsu Tokuda

3. My research on optical fiber cable

(1) Starting my research on optical fiber cable

In response to Charles Kao's 1968 suggestion to use silica optical fiber for its low-loss properties, US glass manufacturer Corning Inc. reported[4] in 1970 that it had developed a 20-dB/km low-loss optical fiber using the CVD (Chemical Vapor Deposition) method. Meanwhile, that same year, the US company AT&T (American Telephone & Telegraph) Bell Labs announced[5] its discovery of semiconductor lasers (which were seen as a potential light source for optical communications) capable of continuous oscillation at room temperature. This sparked research all over the world to commercialize this discovery for optical fiber communication. At NTT Electrical Communications Laboratories, where I worked, the Basic Research Laboratories in Musashino began basic research on optical fiber immediately after the aforementioned events of 1970. However, it was not until 1974 when a group was established at the NTT Ibaraki Electrical Communications Laboratory's Telecommunication Line Research Department for researching and commercializing optical fiber cable ("optical fiber" for short). At first, the optical fiber group consisted of three founding members including myself, and we began

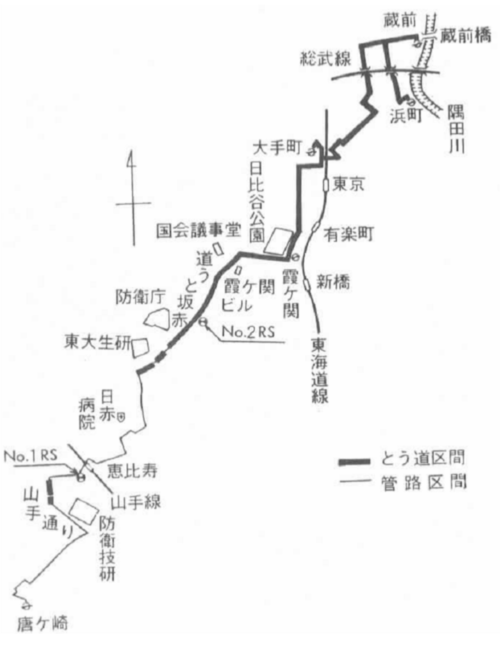

Fig.2 Route[6] of the field trial (FR 1) of the mid- to small-capacity optical fiber cable transmission system in Tokyo

Glossary of terms in Fig.2

蔵前	Kuramae
蔵前橋	Kuramaebashi
総武線	Sobu Line
浜町	Hamacho
隅田川	Sumida River
大手町	Otemachi
東京	Tokyo
有楽町	Yurakucho
新橋	Shimbashi
東海道線	Tokaido Line
日比谷公園	Hibiya Park
国会議事堂	National Diet Building
赤坂とう道	Akasaka Cable Tunnel
霞が関	Kasumigaseki
霞が関ビル	Kasumigaseki Bldg.
防衛庁	Ministry of Defense
東大生研	IIS, the University of Tokyo
日赤病院	Japanese Red Cross Medical Center
恵比寿	Ebisu
山手線	Yamanote Line
山手通り	Yamate-dori Ave.
防衛技研	TRDI, Ministry of Defense
唐ヶ崎	Karagasaki
とう道区間	Cable tunnel section
管路区間	Conduit section

researching the structure of optical fiber and methods of measuring transmission properties entirely from scratch. When I began my research on optical fiber, I applied the results of the aforementioned research on the new transmission medium to find that the two necessary conditions were met. This clearly indicated the potential viability of optical fiber as a new transmission medium, and I became determined to pursue this research. The most significant event that occurred after the research began was in June 1974, when we developed a cable with an optical fiber core. This was in preparation for a visit by His Majesty the Emperor Emeritus (then Crown Prince) to the Yokosuka Electrical Communications Laboratory. The optical fiber strands, produced by the Component Materials Research Department, had to be coated by a resin such as nylon by using an extruder, a task that was assigned to the Telecommunication Line Research Department. Our team leader Mr. Ishida and I tried using polyethylene, a common coating for copper wires, but found this unsuitable due to increased optical loss from the optical fiber. For this reason, we tried resin coatings such as nylon and polycarbonate, but considering that this was our first experience, we had trouble identifying the optimal conditions. After much trial and error, we succeeded at using a nylon coating in time for His Imperial Highness's visit. When we showed him the optical-fiber-core cable propagating a red He-Ne laser beam, the Crown Prince took interest, leading to the dramatic promotion of NTT labs' research on optical fiber cable transmission[6)].

(2) First field trial of a mid- to small-capacity optical fiber cable transmission system in Tokyo ("FR 1" for short)

In 1978, the first field trial of a mid- to small-capacity optical fiber cable transmission system was conducted in Tokyo[7)]. The route selected for the field trial, as shown in Fig.2, was about 20 km, stretching from Kuramae to Gakugei-daigakumae (Karagasaki) along the Hibiya subway line. The optical fiber cable cost 1.6 billion yen and the terminal equipment cost 400 million yen, coming to a total cost of 2 billion yen. This was one of the most expensive field trials ever conducted. For the wavelength, FR 1 adopted a short wavelength of 0.85 μm due to considerations such as optical loss from the semiconductor lasers and optical fiber used at the time. The bit rates of the digital signals were 32 Mb/s and 100 Mb/s. FR 1 required about 1000 km of optical-fiber-core cable to be installed, but one year before the start of FR 1, only a few kilometers' worth of cores satisfied the required transmission bandwidth (at least 250 MHz per 1 km). Therefore, after conducting preliminary trials, we decided to install cable from the best-rated manufacturer for the longest relay section, and cable from the second-best-rated manufacturer for the next longest relay section. This decision was criticized on the grounds that past field trials had not used preliminary trials, but we pushed back, arguing that optical fiber cable was completely different from conventional copper cables; there was no knowing what would happen. Thanks to these preliminary trials, the transmission bandwidth of the graded-index optical fiber developed using MCVD (Modified Chemical Vapor Deposition) and used in FR1 met the 250 MHz·km requirement of all optical fiber, resulting in a wide average transmission bandwidth of 800 MHz·km.

Additionally, all optical loss met the required value of 4.5 dB/km for a wavelength of 0.85 μm; a low average optical loss of 2.8 dB/km was achieved. At the time, we had the world's best transmission-bandwidth and optical-loss values, realizing NTT director Masuno's vision for us to "become the best in the world". NTT has remained top of the world for more than ten years since.

(3) Second field trial of a mid- to small-capacity optical fiber cable transmission system in Kawasaki ("FR 2" for short)

Because FR 1 confirmed that optical fiber was fundamentally unproblematic as a new transmission medium, FR 2 was commenced in January 1980 in Kawasaki to confirm the practical feasibility of the mid- to small-capacity optical fiber cable transmission system. FR 2's main objective was to use a longer wavelength of 1.3 μm, which would result in less optical loss from optical fiber, in addition to the short wavelength of 0.85 μm used in FR 1. An extremely low-loss, wide-bandwidth optical fiber cable was developed using the MCVD method. For a short wavelength of 0.85 μm, the average optical loss was 2.46 dB/km and the average transmission bandwidth was 1130 MHz·km. Meanwhile, for a long wavelength of 1.3 μm, the average optical loss was 0.59 dB/km, and the average transmission bandwidth was 1300 MHz·km. The installed optical fiber cables were spliced by fusion splicing the optical fiber using an arc, resulting in an extremely low average splice loss of 0.07 dB. At the time, this kind of performance was in the best in the world. Additionally, FR 2 was the first field trial to use a long wavelength of 1.3 μm.

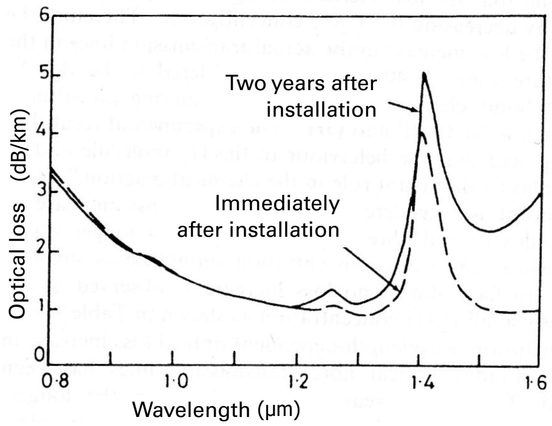

Fig.3 Increase in optical loss from optical fiber [8)]

(4) The problem of increased optical loss from optical fiber cable in FR 2

In FR 2, my group had been measuring the properties of the installed optical fiber cable over time. In June 1982, I discovered a slight but gradually increasing optical loss from the optical fiber cable, which would become a major problem. Here's how it happened. When measuring the optical loss over time from the optical fiber cable installed for the 1.3-μm light source, I noticed a slight increase after two years. Upon measuring the optical-loss wavelength properties, I found that the wavelength was longer than 1.2 μm, and that optical loss was increasing as shown in Fig.3[8)]. Because it was very difficult to measure optical-loss wavelength properties on the field (such as at relay stations) as opposed to in a lab, we were unsure whether to measure the initial properties after installation. However, because frequency properties were the most important properties for a transmission medium, and in the case of optical fiber, wavelength properties corresponded to frequency properties, we decided that we ought to measure these no matter how difficult the undertaking. These post-installation measurements of the initial properties proved extremely useful in determining the cause behind this increase in optical loss. I was acutely reminded of the effectiveness of faithfully implementing measurement principles even in situations like these. Determining the cause of the increase in optical loss was very difficult, but after various attempts at trial and error conducted with the optical fiber manufacturer, we succeeded. We found that unbonded dangling bonds such as Si-O-, Ge-O-, and P-O- generated in the optical fiber manufacturing process had bonded with the hydrogen (H) that had infiltrated the optical fiber to form OH groups. Additionally, the inclusion of phosphorous (P) increased the rate of optical loss. Many manufacturers used P, because it made optical fiber easy to manufacture, but after we made clear that minimizing use of P was important to reduce the increase of optical loss, new manufacturing methods were established accordingly[9)].

(5) Field trial of a large-capacity optical fiber cable transmission system

Around January 1980, when mid- to small-capacity optical fiber had passed its prime in terms of practicality, optical fiber for a large-capacity cable transmission system to connect backbone relay stations started being considered as a potential next step. In October 1980, a field trial began on the 18-km stretch between Atsugi and Sagamihara. This was done as part of the field trial on a large-capacity optical fiber cable transmission system planned for the 80-km stretch between the Musashino Electrical Communications Laboratory and Atsugi Electrical Communications Laboratory. For the optical fiber cable, the first candidate being considered was graded-index optical fiber, whose performance had already been established for mid- to small-capacity optical fiber cable. The second candidate was single-mode optical fiber. This used single-mode propagation, which was free of the bandwidth restrictions imposed by multimode transmission. The adopted wavelength was 1.3 μm, whose performance had already been confirmed in FR 2. When the Yokosuka Electrical Communications Laboratory's Transmission Team experimented with 400-Mb/s transmission on a route built during the field trial, I received a complaint that the experiment could not be conducted because graded-index optical fiber did not have stable transmission properties. I, too, had experienced difficulties with unstable properties when measuring the transmission bandwidth of graded-index optical fiber during installation and splicing. This caused me to abandon the use of graded-index optical fiber in large-capacity systems, despite a proven track record in mid- to small-capacity systems, and focus on single-mode optical fiber, which was experiencing splice-loss problems at the time. I was quite torn by this decision, but my senior colleague at the laboratory would often say to me, "Simple is best!!" "Beautiful is best!!" as if chanting a spell. This decision made optical fiber manufacturing, installation, and line design easier, and led to the use of single-mode optical fiber not only in relay systems, but also in subscriber optical-fiber transmission systems. This became the driving force behind the rise of the subsequent Golden Age of Optical Fiber. I'd like to add that although my doctoral dissertation was on the transmission properties of multimode optical fiber, whose measurement method had become the international standard, also adopted by the JIS standard, I had now abandoned all of those techniques.

At the time, I was already convinced that my decision was correct, but over the years, my conviction has grown stronger. For these achievements, I received the first-ever NTT President's Award and Kajii Award for optical fiber transmission systems in 1982, and the IEICE Merit award in 1986.

(6) Birth of a group for optical fiber cable measurement methods

To promote research on commercializing optical fiber cable, we needed to enhance our research organization. At the Telecommunication Line Research Department, the Optical Fiber Cable Group, which had belonged to the Telecommunication Line Lab, was transferred to the Waveguide Line Lab in April 1975, increasing in size from three to six employees. Subsequently, in January 1976, there was another personnel transfer largely from the Optical Fiber Cable Group, but also from the Component Materials Research Department, Basic Research Laboratories, and others, to form the Optical Telecommunication Line Lab. The first director of the Optical Telecommunication Line Lab was Mr. Masuno from the Component Materials Research Department. I also belonged to the Optical Telecommunication Line Lab, where as group leader, I led research on optical fiber cable measurement methods, where we considered various measurement instruments and methods relating to optical fiber cable. The first question we considered was what kinds of measurement criteria to adopt as an optical fiber cable measurement method, and what kinds of measuring instruments and methods to develop. At the time, we were referencing the results of past research on new transmission media. We wanted to commercialize optical fiber cable as a new transmission medium, so we thought we needed to refer to existing commercialized systems that were still in use. Because the first area of application for optical fiber cable was as a transmission medium for relays, we considered establishing techniques relating to optical fiber cable measurement methods, referencing standard coaxial cable, an existing, proven relay transmission medium. As a result, we thought that for the time being, we would need to develop an optical-fiber optical loss equivalent to coaxial cable's DC resistance and optical-loss wavelength properties equivalent to frequency properties. We would also need to develop modulation frequency properties corresponding to frequency properties for modulation signals (hereinafter abbreviated to "transmission bands" in this article) and an optical pulse tester equivalent to pulse testers needed to locate faults. Finally, we would need to develop an optical fiber identifier equivalent to identifiers that contrast with core wires. Note that because optical pulse testers are known as OTDRs (Optical Time Domain Reflectometers) these days, I will use the term "OTDR" in this article. For the most part, Mr. Tanifuji, Mr. Horiguchi, and Mr. Tateta were in charge of measurement methods for optical fiber's optical loss and transmission bands, and Mr. Nakahira, Mr. Horiguchi, and Mr. Matsumoto were in charge of OTDRs and identifiers.

(7) Development of OTDR

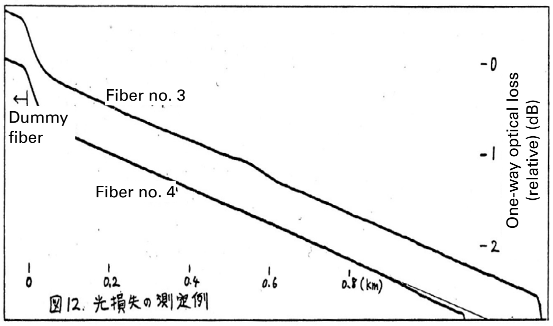

Fig.4 Example of measuring optical loss caused by backscattering[10]

Because optical fiber could break for various reasons, we needed to be able to correctly measure the positions of breakage points. This was because splice losses could occur even after repairing breakage points, and if the position of the breakage point was not correctly identified, splicing would have to be performed multiple times, increasing optical loss across the entire relay section. Pulse testers already existed to locate faults even in standard coaxial cable, but we felt we needed similar pulse testers for optical fiber cable, and developed an optical pulse tester (a.k.a. "OTDR"). FR 1's OTDR adopted a method of estimating the breakage position by detecting Fresnel reflections about 35 dB lower than the propagated light, anticipating reflections at the V-groove splice point, instead of the fusion splicing used for optical fiber splicing. Even in this case, the OTDR required a dynamic range of 65 dB. This was achieved using the digital averaging technique, which had just been developed at the time. Mr. Nakahira and Mr. Horiguchi were in charge of the OTDR development for FR 1.

FR 1's OTDR was detecting Fresnel reflections at the V-groove splice point, but complex breakages in the optical fiber sometimes resulted in no Fresnel reflections at all. For FR 2, a method of detecting Rayleigh-backscattered light that causes optical loss in low-loss optical fiber is being considered as a method of detecting breakage points in optical fiber even in complex cases. Fig.4 shows the results found when Mr. Nakahira calculated the level of backscattered light in an attempt to detect backscattered light by building a measurement system using a boxcar averager that could detect faint signals. As shown in the figure, results clearly showed that at a wavelength of 0.9 μm, not only the breakage point, but also the optical loss and splice loss of optical fiber could be measured[10]. For FR 2, an attempt was made to expand the dynamic range of 65 dB for the OTDR considered in FR 1, to 100 dB or more. Additionally, to prevent the saturation of high-sensitivity photodetectors by Fresnel reflections occurring in the incident end of optical fiber or optical connectors, a technique was developed to mask that reflected light. This resulted in the development of an OTDR for field trials that could measure the optical loss and splice loss of optical fiber. Mr. Horiguchi also developed an OTDR for a wavelength of 1.3 μm based on the OTDR for a wavelength of 0.9 μm.

Field trials before FR 2, which targeted a mid- to small-capacity optical fiber cable transmission system, used multimode optical fiber. Meanwhile, large-capacity optical fiber cable transmission systems used single-mode optical fiber, so the ratio of backscattered to transmitted light was reduced by dozens of dB. To address this, Mr. Horiguchi, who had already been researching OTDR, and Mr. Nakazawa, who had joined my group in April 1980, developed a more powerful mask-function method that used an ultrasonic light deflector. Mr. Nakazawa also considered ODTR using a solid-state YAG laser as a light source, achieving a fault-location search distance of about 35 km for single-mode optical fiber, and about 60 km for multimode optical fiber. Meanwhile, because the minimum optical loss from quartz-based optical fiber exists at wavelengths close to 1.5 μm, we considered conducting research on an optical transmission system around that wavelength. We developed an ODTR using an Erbium (Er) laser instead of a YAG laser, which successfully detected backscattered light in 130 km of optical fiber[11]. Additionally, we considered an ODTR using a wavelength in the 1.5 μm band using stimulated Raman scattering of a YAG laser, and measured the wavelength properties of optical-fiber loss in an ODTR using a fiber Raman laser. In 1994, I received the FY 1993 NTT Patent Implementation Compensation Award (Distinguished) for the patent of the OTDR we developed at this time.

(8) Optical fiber amplification and active optical cable

When Mr. Nakazawa studied the optical amplification of a 1.3-μm-wavelength LD signal via backscattering of an optical pulse created by pumping a 1.06-μm-wavelength YAG laser, a gain of about 20 dB was achieved[12]. I took interest in this phenomenon, because I thought it could greatly expand the relay section of optical transmission systems. I worked with Mr. Nakazawa to find a way to amplify optical fiber's 1.5-μm band, which showed the lowest loss from optical fiber. As a result, we found that by using a pump light source using a 1.3-μm YAG laser or 1.5-μm Erbium (Er) laser, we could amplify optical fiber in the 1.5-μm band, and filed a patent application[13]. We also decided to create a research proposal on active optical cable with the intention of greatly expanding relay intervals via optical-fiber amplification, and promote research on the topic in earnest. However, because I was promoted to director of the Telecommunication Line Lab in February 1984, I could no longer carry out this research myself. I am certain that the completion of this research by Mr. Nakazawa and others according to this research proposal on active optical cable earned him the 2023 Japan Prize shown in Fig.5.

Fig.5 Award ceremony for the Japan Prize
Source: "Nikkei" web edition (April 14, 2023)

(9) Development of multi-core optical connectors

After commercial tests began in 1983 on a large-capacity optical fiber cable transmission system running through Japan, NTT Ibaraki Electrical Communications Laboratory's research on optical fiber cable shifted from relay systems to subscriber systems. At that time, in February 1984, I was promoted to director of the Telecommunication Line Lab, where I researched optical-fiber splicing techniques for use in subscriber systems. We were trying to introduce ribbon-fiber-optic cable (whose core was made of numerous optical-fiber strands in ribbon form) in subscriber systems. At the Telecommunication Line Lab, we were researching splicing methods for ribbon-fiber-optic cable. There were two methods of permanently splicing optical-fiber-core cable: fusion splicing the optical fiber by using an arc, and splicing by V-groove; we were studying both methods for ribbon-fiber-optic cable. Additionally, while attachable and detachable optical connectors had been developed for optical-fiber-core cable, multi-core optical connectors were also being studied for ribbon-fiber-optic cable. My predecessor as director of the Telecommunication Line Lab was Mr. Sakamoto, who at the time had been researching the aforementioned optical-fiber spicing method; I took over this research while advancing it further. Among this research was a technology we developed independently for multi-mode optical connectors, which was used as the de-facto standard not only in subscriber systems, but also in data centers processing vast amounts of data in the US. Multi-core optical connectors had been developed by Mr. Nagasawa and Mr. Toshiaki Satake, and were recognized as an IEEE Milestone in 2017. Mr. Satake also founded US Conec Ltd. in the US, and promoted the introduction of multi-core optical connectors in data centers[14)].

(10) Development of waterproof optical cable

In February 1986, I was transferred from the Telecommunication Line Lab to the Telecommunication Line Facility Lab, where I was director. The Telecommunication Line Facility Lab was trying to start researching EMC. For background details on this process, see the next section, "From optical-fiber-cable research to EMC research relating to telecommunication equipment". As for other research topics, I was in charge of cable-sheath splicing techniques and special optical fiber cable for subscribers. Here, I will introduce an example of special optical fiber cable that was developed largely by Mr. Koga: a waterproof optical fiber cable[15)]. In Japan, gas maintenance was primarily adopted for waterproofing not only optical fiber cable but cables in general, while in the US, jelly-filled cables were used. Around 1987, Japan was strongly urged by the US to introduce waterproof optical fiber cable. Because this was not available in Japan at the time, Japan had no choice but to comply. However, there were problems with jelly-filled cable such as: (1) difficulty wiping off jelly that adhered to optical fiber, (2) discomfort when the jelly oil stuck to one's hands, (3) the sticky mess caused by jelly falling on the floor. To resolve these problems, Mr. Koga conceived and developed the idea of waterproofing cable by using the water-absorbent powder used in diapers. This waterproof optical fiber cable was developed jointly with the Optical Telecommunication Line Facility Lab (whose director was Mr. Nihei), which had developed the optical fiber cable for subscribers. As a result of this development, Japan began using locally produced waterproof optical fiber cable instead of the US jelly-filled optical fiber cable. Because this waterproofing technique for optical fiber cable was also applicable to general metal cables, the technology was developed further, and had an enormous impact on the industry.

4. From optical-fiber-cable research to EMC research relating to telecommunication equipment

(1) The Ministry of Posts and Telecommunications' response to transmission systems for optical

fiber cable for subscribers that combined communication and broadcasting

In February 1986, I moved from the position of director of the Telecommunication Line Lab at the NTT Ibaraki Electrical Communications Laboratory's Telecommunication Line Research Department, to director of the Telecommunication Line Facility Lab. The Telecommunication Line Facility Lab was mostly researching special optical fiber cables for subscribers and cable-sheath splicing with the aim of commercializing composite systems providing both communication and broadcasting capabilities. Because of the high price of optical fiber cable used in subscriber optical fiber cable transmission systems at the time, use of phone transmission alone was not economically feasible, so systems that also allowed CATV broadcast reception were being considered. To implement the first such subscriber optical fiber cable transmission systems in Marunouchi, Tokyo, we applied for permission to the (then) Ministry of Posts and Telecommunications, but we were rejected. Before NTT's privatization in April 1985, when it was still the "Nippon Telegraph and Telephone Public Corporation", NTT was largely conducting its communication administration independently of the Ministry of Posts and Telecommunications. It's presumable that for this reason, around 1986, the Ministry of Posts and Telecommunications feared becoming increasingly redundant as NTT expanded its scope from communication to broadcasting. The Ministry of Posts and Telecommunications must have therefore seen the combination of communication and broadcasting as a move by NTT to take over not only the field of communication, but also broadcasting; an unacceptable prospect. At the time, I anticipated that once the Ministry of Posts and Telecommunications had made a decision, its policy would not change for at least ten years. I figured the commercialization of subscriber optical fiber cable transmission systems was at least a decade away. Sure enough, the combination of communication and broadcasting started to be discussed again ten years later, around the year 2000, proving my prediction correct.

Having completed the first commercialization of mid- to small-capacity optical fiber cable in about five years in response to the major shift in transmission media from metal to insulators, driving top-of-the-world innovation in the field, I couldn't bear to wait more than ten years for commercialization. Not only that; although the optical fiber cable for the first commercialized relay system was novel in every way, the optical fiber cable for subscriber systems was still in the development stage. The latter did not feel as "cutting edge" as the former.

(2) The major personnel transfer from the EMC Study Group to the Telecommunication Networks Laboratories

For many years, about five members of the Telecommunication Line Facility Lab had been researching induction security and lightning protection for power companies' power transmission lines. In 1986, Mr. Koga and Mr. Ideguchi created a proposal expand on this research to study EMC in telecommunication systems. This was around the time of the founding of VCCI (Voluntary Control Council for Interference by Information Technology Equipment) (in 1985), which began regulating electromagnetic interference radiated from computers and telecommunication equipment. I saw a more promising future for EMC in telecommunication equipment than for optical fiber cable for subscriber systems, and decided to greatly enhance the research organization surrounding the former. Around this time, plans were being carried out for a major change in NTT's laboratories: research groups would be organized by function rather than region, and preparations were underway to establish the "Telecommunication Networks Laboratories" focusing on the Musashino R&D Center. It was considered too difficult to unify EMC research on telecommunication equipment such as switching systems, transmission units, and telephones under the Telecommunication Line Facility Lab, which was already researching special optical fiber cable and cable sheaths. Thus, the plan was to move the EMC research team to the newly established Telecommunication Networks Laboratories. Fortunately, the director of the preparatory office for Telecommunication Networks Laboratories was a long-time associate of mine, Mr. Yamagata, who readily agreed to our proposal when we consulted with him. Thus, NTT Telecommunication Networks Laboratories was founded in July 1987, and I was appointed leader of its EMC Study Group. When I joined the Telecommunication Line Facility Lab, there were only five EMC personnel, which grew to 14 in a year and a half, and there was a major transfer of personnel from Ibaraki to Tokyo[6].

Fig.6 Photo of the interior of the large anechoic chamber published on the cover of "Spectrum" magazine[16]

The first director of NTT Telecommunication Networks Laboratories, Mr. Goto, and the first head of the Telecommunication Quality Lab, Mr. Aoyama, highly commended the study group on telecommunication EMC, and strove to enhance the research organization and expand its facilities. First, in 1989, a large anechoic chamber designed to measure large EUTs (of which even the smallest configurations were at least 5 m wide, like D70 digital switching systems) using the 10-m method was built in the Musashino R&D Center. This anechoic chamber is also registered with the US FCC (Federal Communications Commission) as an anechoic chamber that can test radiated emissions using the 3-m and 10-m methods. This anechoic chamber was published on the cover of the October 1989 issue of "Spectrum" magazine, as shown in Fig.6[16]. Additionally, in 1987, the Telecommunication EMC Liaison Committee (chief examiner: director of the Telecommunication Networks Laboratories) was established. The purpose of this move was to build an NTT-wide organization for studying EMC problems and formulated guidelines for regulating the EMC specifications of telecommunication equipment purchased by NTT[6]. I also became a VCCI member to encourage NTT to join VCCI, and set up the "VCCI Internal Response Committee" to maintain that organization. At the Business Department, support for these activities was provided by Mr. Yuuki of the Technical Division's Telecommunication Line Dept.

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Note: Figure numbers and reference numbers shown here are the serial numbers from issue No. 152.

Masamitsu Tokuda

1967 Graduated from Electronics Engineering Department of Hokkaido University
1969 Completed Electronics Engineering, Faculty of Engineering, Graduate School of Hokkaido University
Joined NTT, assigned to the Electrical Communications Laboratories
1987 Leader of EMC Study Group, NTT Telecommunication Networks Laboratories
1996 Professor of Electric Engineering Department, Kyushu Institute of Technology
2001 Professor of Electronic Communication Department, Musashi Engineering University
2010 Professor emeritus of Tokyo City University
Visiting co-researcher of the Graduate School of Frontier Sciences, The University of Tokyo

Major prizes received
1986 Merit award – IEICE
(on the design theory and evaluation method for optical fiber cables)
1997 Information communication merit award by MPT
(on EMC technology development)
2003 Industrial standard merit award by the minister of METI
2004 IEICE fellow
2007 Promoted to IEEE fellow

Report on 2024 Technical Symposium

Technical Subcommittee

This is a report on the 2024 Technical Symposium.

- Venue: Kikai Shinko Kaikan
- Date: February 8, 2024 (Thu)

The 2024 Technical Symposium was held on February 8, 2024 (Thu) at the Kikai Shinko Kaikan in face-to-face format, as was the case last year. 58 members participated.

At the Technical Symposium, the Technical Committee chairperson gave a briefing on the FY 2023 activities of the Technical Subcommittee and working groups and gave an overview of papers presented at domestic and foreign academic conferences. This was followed by reports detailing the activities of the working groups. Afterwards, the Secretariat explained the details of two revisions to the guidance documents made in 2023.

The program is shown on the next page.

Presenters

Theme	Presenter
Overview of VCCI Council	Akira Oda Executive Director, VCCI Council
Technical Symposium	
Technical Subcommittee Opening Considerations for the Technical Symposium	Shinichi Okuyama NEC Platforms, Ltd. Chair, Technical Subcommittee
Technical Subcommittee - CISPR Project Working Group Deliberation Efforts for CISPR Standards and Progress of Domestic Endorsement	Takuya Nakamori Panasonic Connect Co., Ltd. Convener, CISPR Project WG, Technical Subcommittee
Technical Subcommittee - VHF-LISN Working Group CISPR Standardization Trends of VHF-LISN and Future Initiatives	Kunihiro Osabe VCCI Council CISPR/SC-A/I JAHG6 Co-Convener Convener, VHF-LISN WG, Technical Subcommittee
Technical Subcommittee – Radiated Emission Working Group Considerations on Phase Center Correction of Hybrid Antenna	Akira Murakami e-OHTAMA, LTD. Convener, Radiated Emission WG, Technical Subcommittee
Technical Subcommittee – Conducted Emission Working Group Report on Verification of Prototype Improved Transformer-Coupled 8W-AAN	Naoya Haraguchi FUJIFILM Business Innovation Corp. Convener, Conducted Emission WG, Technical Subcommittee
Technical Subcommittee – Antenna Calibration and Site Validation Working Group Verification of Test Site Validation Methods for Radiated Emission Measurement (18 GHz to 40 GHz)	Hironari Tanaka Ohtama Calibration Service Co., Ltd. Convener, Antenna Calibration and Site Validation WG, Technical Subcommittee
Presentation on the revised guidance documents Guidance for Rules for Voluntary Control Measures VCCI 32-1-J:2023 Guidance for Preparing Test Reports (For VCCI-CISPR 32) VCCI 32-1-A:2023	Hidenori Muramatsu Technical Counsel, VCCI Council

Report on the VCCI Seminar at Tokatsu Techno Plaza

Steering Committee

Sponsor: Tokatsu Techno Plaza, Chiba Industry Advancement Center
1. Date and time: February 29, 2024 (Thu) 13:30- 16:40
2. Venue: Training room 2, 3F, Tokatsu Techno Plaza
3. Attendees: 36 (including 5 from Tokatsu Techno Plaza)
4. Lectures: (Conductor: Masahiro Hoshino (Secretary General))

Theme	Lecturer
Introducing the VCCI Council's activities and future regulatory trends	Akira Oda Executive Director, VCCI Council
The VCCI Council's technical requirements - "Technical Requirements": Overview of VCCI-CISPR 32:2016 standards - New measurement methods (WPT) under consideration for standardization	Hidenori Muramatsu, Technical Counsel
Notes on performing measurements based on the technical requirements - Overview of emission measurement - Introduction of a guidance document for creators of test reports and notes on report creation	Hidenori Muramatsu, Technical Counsel
Notes from the standpoint of test-report document inspections - Content analysis results and countermeasures	Minoru Hirahara, Technical Adviser
Results and scope of market sampling test - Details of inquiries received by the VCCI Council	Minoru Hirata, Technical Counsel

5. Overview:

A VCCI seminar was previously held at Tokatsu Techno Plaza in November 2018. After restrictions to prevent the spread of the COVID-19 pandemic were lifted, we were invited back to hold another VCCI seminar. The seminar attracted enthusiastic attendees from Hyogo and Nagano Prefectures, as well as affiliates of our sponsor Tokatsu Technical Plaza, including the Director, Mr. Otake.

The VCCI Council has been holding events at industrial technology centers in prefectures of Japan since 2006. Events included introductions to the VCCI Council's activities and technical seminars relating to EMC. Going forward, VCCI plans to continue holding such events while taking requests from each prefecture and region. We are deeply grateful to Tokatsu Techno Plaza's Director, Mr. Otake, the Vice Director, Mr. Saito, the R&D Section Manager Mr. Yasuhara, Mr. Takahashi, and all other affiliates for giving us the opportunity to hold this seminar.

Lecturers

Lecture

Report on the VCCI International Forum 2024

International Relations Subcommittee

The VCCI Council provides members with information on the status of countries and regions where EMC regulations are undertaken or under consideration. VCCI Council holds an international forum every year as part of an initiative to provide members with the latest information.

Now that COVID-19 has settled down in 2024, we were able to hold our first face-to-face session in five years. On March 8, 2024, the VCCI International Forum 2024 was held at the U Thant International Conference Hall at the United Nations University.

The forum was a great success with 85 participants including Japanese members (mainly manufacturers and testing laboratories) and overseas members.

At this year's International Forum, lecturers were invited from the US and the EU, which are always highly requested by our members, to speak about regulatory trends in various countries and regions.

[Invited countries and regions, and themes]

- USA: Overview of draft revisions to ANSI C 63.4
- EU: Latest electrical, electronic, and mechanical regulatory trends in the EU

At these lectures, lecturers mostly gave clear, but detailed, outlines of trends in EMC regulations and relevant laws in each country and region, providing useful information to forum attendees. After every lecture, time was set aside for a Q&A session to address questions from venue attendees. The opportunity to receive answers directly from lecturers helped inform attendees and deepen their understanding of the issues, facilitating fulfilling discussions and stimulating exchanges between lecturers and attendees. This article includes an overview of these Q&A sessions for your reference.

The VCCI International Relations Subcommittee will continue to hold international forums. For the next forum, they will select themes to meet the members' requests and encourage more participation. We would appreciate if members inform the VCCI Secretariat of their desired countries and regions, as well as themes for presentations.

VCCI International Forum 2024 Program

Time	minutes	item
13:00-13:15	15 min	“VCCI Update” Mr. Akira Oda, Director, VCCI Council
13:15-14:15	60 min	“Draft ANSI C63.4:202?　A review・・・” Mr. Andy Griffin Chair of ANSI C63.4 WG Cisco Systems
14:15-14:35	20 min	Q&A for USA
14:35-15:05	30 min	Coffee break (rest and interaction)
15:05-16:05	60 min	“The latest regulatory developments of the electrical, electronic and machinery sectors in the European Union.” Mr. Luis Miguel VEGA FIDALGO Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs European Commission
16:05-16:25	20 min	Q&A for EU
16:25-16:45	20 min	Appreciation to the guests and wrap up

Overview of Q&A

Details of the questions and answers are provided to VCCI members for reference. Final decisions regarding these matters must be made by the company in question.

◆ “Overview of draft revisions to ANSI C63.4”
Q&A for speaker Mr. Andy Griffin

Q1: The latest edition of ANSI C63.4 seems to be published late every year. Do you think the standards will be published and adopted by the FCC on schedule?
Also, when do you expect ANSI C63.4: 2023 to be adopted by the FCC and applied to ANSI C 63.4:A1:2017?

A1: I believe the latest edition of ANSI C63.4 will be agreed upon in the second half of 2024. As for its adopted by the FCC, C63.4 A1, which was published in 2017, hasn’t been adopted by the FCC either, so the latest edition of ANSI will likely be adopted two or three years after publication.

Q2: Because the current ANSI C63.4:2014 cites CISPR 16-2-3:2016, I interpret this as ”for horizontal extensions of beam width w, the EUT is not required to be fully inside beam width w”.
However, CISPR 16-2-3:2019 corrects this to ”For the horizontal range of beam width w, the EUT

volume width must fit completely inside beam width w." So, if the EUT does not fit inside beam width w, the antenna would need to be moved back, raising concerns about the size and reception sensitivity of the anechoic chamber. What do you think ANSI C63.4 is saying in this regard?

A2: I believe that even if the EUT is wider than beam width w, the rotating table can be turned, meaning the antenna does not need to be moved horizontally, and it is acceptable to perform a vertical scan only.
ANSI has also debated whether the antenna ought to be moved horizontally in the case of a wide EUT, but this is likely not a requirement, and will be included in the guidance document instead. This is because additional chamber calibration might be required.

Q3: When conducting measurements using linear antenna scanning, does the SVSWR height need to be evaluated up to the EUT height, or unconditionally up to a height of 4 m?

A3: Additional height might be required as specified in CISPR 16. ANSI adopts CISPR 16 as the site evaluation method.

Q4: Apparently, LISN calibration must comply with the CISPR-16 standard for extension cables, but there is a discrepancy with CISPR 32, which says to perform calibration at the connection point with the EUT. (Is the plug insertion point where the extension cable connects? Or where the LISN connects?) According to ANSI C63.4, can calibration be performed without an extension cable?

A4: Perform calibration without an extension cable. CISPR 32 probably needs to be changed.

Q5: Is a method being considered for radiated emission measurement at 1 GHz or more that uses a reverberation chamber?

A5: ANSI's task force is currently considering this, and preparing a guidance document on measurement methods. That will probably be used as an alternative method in the future.

Q6: Are there plans to add FAR as a place of measurement for radiated emission measurement from 30 to 1000 MHz?

A6: At this point, there are no plans to adopt FAR. We have not received any requests to add FAR.

Q7: Does ANSI C63.4 show a specific policy or direction for measurement at 40 GHz or more as a future prospect?

A7： There are no such plans at this stage. This is because there is not actually much equipment that uses signals in frequency bands exceeding 40 GHz.

◆ "Latest electrical, electronic, and mechanical regulatory trends in the EU"
Q&A for speaker Mr. Luis Miguel VEGA FIDALGO

Q1: Currently, there seems to be a lot of regulatory activity in the EU relating to the circular economy. However, I don't see any major developments such as legal amendments relating to EMC Directives or low-voltage directives. Could you give me your outlook on what kinds of developments you expect in the future?

A1: The committee has evaluated the effectiveness of EMC Directives and low-voltage directives, and found that the current directives function well. Updates to the standards will be enough, and revisions to high-level directives will not be necessary. However, the handling of recycled products and recycling businesses might change in the future.

Q2: The list of harmonized standards published by the OJ (Official Journal) contains entries with no specified withdrawal date for compliance prediction. In these cases, does the new version of the standard apply immediately?

A2: I'll check this later, but I'm not sure of the specifics. There is definitely supposed to be a transition period of 18 months, during which the previous version can be used. In special cases, like if there's a major problem in the standards, withdrawal might be immediate, but this would be rare. I'll check about this.

Q3: CENELEC is adopted and published as the latest standard, but is it okay to apply a standard for compliance prediction even when the standard isn't adopted by OJ?

A3: The answer is "no". Only standards published in OJ can be used for compliance prediction. For example, say that the CENELEC standard is updated from V3 to V4, but OJ has only published V3. You can use any new changes to the standard, or a standard not published in OJ, but you will have to be able to explain to market oversight authorities how you are in compliance with the directives.

Q4: CENELEC has issued EN 55032:2015/A1:2020 as the latest standard, and the switchover deadline is December 4, 2023, which has already passed. Are there any plans to extend this deadline? Some testing laboratories recommend using A1, so I'm confused. Do we apply EN 55032:2015/A11:2020 as shown in the list of harmonized standards, even though the switchover deadline has passed?

A4: My thinking around applying standards is the same in as my answer to question 3. The committee decides independently of CENELEC when to perform switchover, so there is no obligation for the withdrawal date for the old standards from OJ to match the CENELEC standard's switchover date.

Q5: The tolerance value for radiated disturbances exceeding 1 GHz specified in A1 of the multimedia-equipment standard EN 55032 is considered an unjustifiable relaxation of the standard. Why is this?

A5: The standardization body relaxed the tolerance value, but we cannot accept this. The committee does not deem this a justifiable relaxation because the product still requires as high a level of protection as before. You can see the meeting minutes for this discussion at the CIRCABC website.

Q6: It seems the Radio Equipment Directive EN 301 489 standard will be removed from the EMC Directives. Does that mean version 1.9.2 will be depreciated? Will EN 301 489-1 be removed from the EMC Directives? In the case of the latter, what will happen to the concepts around the estimated compliance standard for radio-equipment EMC in the Radio Equipment Directive?

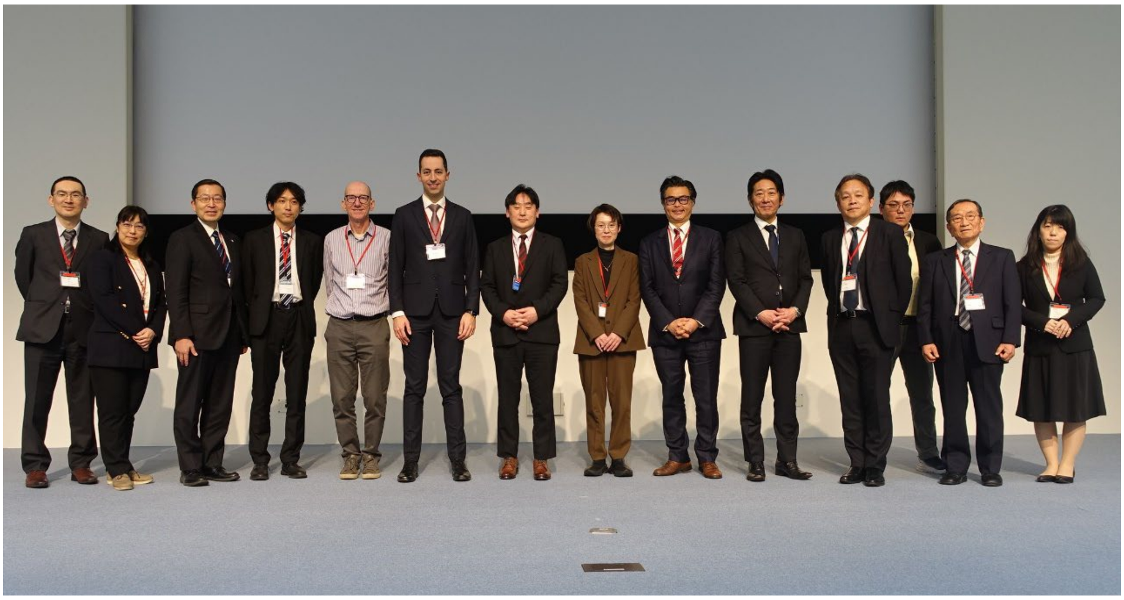
A6: EN 301 489-1 will be removed from the EMC Directives, and is not a standard for estimating compliance. However, 301 489 will still be available because this is a family standard for common parts applying across products. Standards for special parts are planned to be published, as requested by ETSI. In response to the question of whether you can continue to use this part, the answer is "yes, you can". From an emission and immunity standpoint, you can use the part at your own risk provided you are in compliance with the EMC Directives.

Mr. Akira Oda, Executive Director of VCCI

Mr. Andy Griffin

Mr. Luis Miguel VEGA FIDALGO

Mr. Yukio Uchida,
Chair of the International Relations Subcommittee



Guest speakers and International Relations Subcommittee members

Status on FY2024 Market Sampling Tests

Market Sampling Test Subcommittee

As of March 29, 2024

Planned number of market sampling tests	Loan-based	35	100
	Purchase-based	65	

Terms of sampling tests		Selected samples	Cancelled (Not shipped, etc.)	Testable samples	Test completed (breakdown below)	Judgment			
						Passed	Failed- tentative		
							Finally passed	Finally failed	Pending
Grand total		104	4	100	97	94	1	3	2

Loan-based testing total		38	3	35	35	33	0	0	2
Term (breakdown)	1st Quarter	9	3	7	7	7	–	–	–
	2nd Quarter	9	—	9	9	8	—	—	1
	3rd Quarter	10	1	9	9	9	—	–	–
	4th Quarter	10	—	10	10	9	—	—	1

Purchase-based testing total		65	1	65	62	61	1	3	0
Term (breakdown)	1st Quarter	10	—	10	10	9	—	1	–
	2nd Quarter	16	1	15	15	14	1	—	—
	3rd Quarter	20	—	20	17	19	—	1	—
	4th Quarter	20	—	20	20	19	—	1	–

"Failed-tentative" in FY 2021 (*1)	Judgment		
	Passed	Failed	Pending
1	0	1	0

*1: Samples that "Failed - tentative" in FY 2022 were additionally surveyed in FY 2023.

Final result	Passed	Failed	Carry forward (*2)
	95	4	2

*2: Pass/fail decisions will be carried forward to FY2024.

Document inspection	Selected samples	Cancelled (withdrawal, etc.)	Inspectable samples	Pre-check completed	Judgment completed	Judgment	
						Cleared	Problems identified
	43	3	40	40	40	38	2

Details of failure in FY 2023

As of March 2024

Company	Planex Communications Inc.
Device : model	Sumakame (Smart Camera) CS-QS51-LTE
Test result	Conducted disturbance measurements - Power port : 7.1 dB excess at 0.621 MHz - Wired network port : 5.1 dB excess at 0.612 MHz
Cause / improvement	Cause: A different AC adapter from the AC adapter used in conformity confirmation test by the overseas ODM partner was adopted for mass production. Countermeasures: Replace the AC adapter with an alternative AC adapter. Measures to take on stocked and shipped products: Publish a notice on the company website regarding the replacement with the alternative AC adapter. Prevention: Issue a serious warning to the ODM partner and ensure strict management, for example ensuring that parties are notified of changes to components. Check the model number of the AC adapter upon inbound inspection.

Details of failure in FY 2023

As of March 2024

Company	TEAC Corporation
Device : model	Voice Recorder: TASCAM VR-04
Test result	Radiated emission measurements Horizontal : 19.2 dB excess at 240 MHz Vertical : 8.5 dB excess at 959.973 MHz
Cause / improvement	Cause: Audio data transfer between PCs connected using the USB cable packaged with the product produces electromagnetic noise exceeding the standard limit. When the OEM supplier requested a lab test, only the device itself was provided to the lab. For the test, the lab used their own cable and other supporting equipment, resulting in a passing judgment. Later, an unevaluated, unconfirmed USB cable was bundled and shipped with the device as a packaged product. Countermeasures: Replace the packaged USB cable with a compliant product that has a ferrite core. The device itself requires no countermeasures. Measures to take on stocked and shipped products: For newly produced and stocked products, replace the USB with a compliant USB cable before shipping. For shipped products, publish a notice on the website. To any users experiencing issues, provide a compliant cable free of charge. Prevention: Confirm the specifications of items packaged with the final product in advance, and if evaluations are performed by an external testing laboratory, ensure that the EUT conditions in the test report are checked.

Report from the Secretariat

● List of Members (January 2024 - March 2024)

New members

Membership	Member No.	Company Name	Country
Regular	4351	Acer Japan Corp.	JAPAN
Regular	4355	Panasonic Housing Solutions Co., Ltd.	JAPAN
Regular	4350	i.safe MOBILE GmbH	GERMANY
Regular	4352	FORESEESON KOREA Inc.	KOREA
Regular	4353	Fractal Gaming AB	SWEDEN
Regular	4354	Hunan Fullriver High Technology Co., LTD.	CHINA
Regular	4359	Brelyon Inc	USA
Supporting	4361	Tianjin Dongdian Testing Service Co., Ltd.	CHINA
Supporting	4363	Xingsheng Certification Service (Suzhou) Co., Ltd.	CHINA

Company name change

Membership	Member No.	Company Name	Country	Old company name
Regular	329	NTT DATA Japan Corporation	JAPAN	NTT DATA CORPORATION
Regular	1066	FCL COMPONENTS LIMITED	JAPAN	FUJITSU COMPONENT LIMITED
Supporting	2973	MG CO., LTD.	JAPAN	M-System Co., Ltd.
Regular	537	Fiery, LLC	USA	Electronics for Imaging, Inc.
Regular	2353	ADATA Technology Co., Ltd.	TAIWAN	A-DATA Technology Co., Ltd.
Regular	2431	Apricorn	USA	Apricorn, Inc.
Regular	2480	Ruckus Wireless LLC	USA	Ruckus Wireless, Inc.
Regular	2715	JOOSUNG Corp. INC.	KOREA	CONBUZZ Co., Ltd.
Regular	3271	Eurofins TA Technology (Shanghai) Co., Ltd.	CHINA	TA Technology (Shanghai) Co., Ltd.
Regular	3524	Extron	USA	Extron Electronics
Regular	4001	Huaqin Technology Co., Ltd.	CHINA	Huaqin Telecom Technology Co., Ltd.
Supporting	1211	Element Materials Technology Fremont Newark	USA	NTS Labs LLC
Supporting	4065	Kiwa Electrical Compliance	U.K.	RN Electronics Limited

Note: Please fill out and submit "Form 9 Change Notification" on the website when a company name has been changed.

● FY 2024 schedule of VCCI events and training seminars

April	May	June • Release VCCI Dayori No. 153 • COMPUTEX TAIPEI • Education and training seminar "The basic technique of EMI measurement"
July • TECHNO-FRONTIER 2024 • Education and training seminar "The basic of electromagnetic waves, EMI measurement technique" • Business report meeting	August Release Annual Report	September Release VCCI Dayori No. 154
October CEATEC 2024	November	December Release VCCI Dayori No. 155
January	February Technical Symposium (plan)	March Release VCCI Dayori No. 156

● Status of Compliance Test Notifications
January 2024—March 2024 (Product names are examples and are not limiting)

Classification of MME (Product types are not limited to only the following examples.)				Classification code		January 2024			February 2024			March 2024		
				Class A	Class B	Class A	Class B	Total	Class A	Class B	Total	Class A	Class B	Total
ITE	Computer	Large	Super computer, Server, etc.	A 2	a 2	22	2	24	14	0	14	22	1	23
ITE	Computer	Stationary	Workstation, Desktop PC, etc.	B 2	b 2	4	20	24	5	15	20	8	15	23
ITE	Computer	Portable	Laptop PC, Tablet PC, etc.	C 2	c 2	0	78	78	1	41	42	0	35	35
ITE	Computer	Other computers	Wearable computers, Wearable device, Smart watch, Smart glass, etc.	E 2	e 2	3	2	5	0	1	1	0	0	0
ITE	Peripheral / Terminal	Memory device	HDD, SSD, USB Memory, Media drive, Disk device, NAS, DAS, SAN, etc.	G 2	g 2	10	20	30	10	16	26	10	12	22
ITE	Peripheral / Terminal	Printer device	Printer including multifunction machine, etc. (portable)	H 2	h 2	5	1	6	1	6	7	3	2	5
ITE	Peripheral / Terminal	Display device	CRT display, Monitor, Projector, etc.	J 2	j 2	1	66	67	3	56	59	11	65	76
ITE	Peripheral / Terminal	Other I/0 devices	Image scanner, OCR, Pen tablet, Stylus pen, etc.	M 2	m 2	2	7	9	1	2	3	1	0	1
ITE	Peripheral / Terminal	General purpose terminal	Display controller terminal, etc.	N 2	n 2	1	0	1	0	2	2	1	0	1
ITE	Peripheral / Terminal	Special purpose terminal	POS, Terminal for finance, insurance etc.	Q 2	q 2	3	2	5	4	5	9	12	0	12
ITE	Peripheral / Terminal	Other peripheral	PCI Card, Graphics Card, Mouse, Keyboard, Cradle, etc.	R 2	r 2	9	44	53	5	36	41	10	30	40
ITE	Peripheral / Terminal	Copying machine / Multifunction copying machine	Copying machine, Multifunction copying machine, etc. (Stationary)	S 2	s 2	0	0	0	2	0	2	0	3	3
ITE	Communications equipment	Terminal equipment	Mobile phone, Smart phone, PHS phone, etc.	T 2	t 2	0	2	2	0	6	6	0	6	6
ITE	Communications equipment	Terminal equipment	Telephone device such as PBX, FAX, Key telephone systems, Cordless phone, etc.	U 2	u 2	0	1	1	0	4	4	0	1	1
ITE	Communications equipment	Network-related equipment	Communication line connecting device including Modem, Digital transmission unit, DSU, TA, Media converter, etc.	V 2	v 2	1	0	1	2	2	4	1	2	3
ITE	Communications equipment	Network-related equipment	LAN-related device, including Router, HUB, etc. Local switch, etc.	W 2	w 2	32	15	47	61	22	83	67	16	83
ITE	Communications equipment	Other communication equipment	Other communication equipment	X 2	x 2	14	4	18	14	5	19	39	8	47
Broadcast receiver equipment			TV, Radio, Tuner, Video recorder, Set-top box, etc.		k 2		0	0		0	0	0	0	0
Audio equipment			Speaker, Amplifier, IC recorder, Digital audio player, Headset, DTM, AI speaker, etc.	L 2	l 2	0	8	8	0	2	2	0	4	4
Video equip ment		Video equipment	Digital video camera, Web camera, Network camera, Video player, Photo frame, Digital camera, Drive recorder, etc.	I 2	i 2	5	7	12	4	4	8	14	7	21
Video equip ment		Other video equipment	VR goggles, Scan converter, etc.	P 2	p 2	1	0	1	0	0	0	0	1	1
Entertainment lighting control equipment			Entertainment lighting control equipment, etc.	Z 2	z 2	0	2	2	0	0	0	0	0	0
Other MME	Entertainment / Education	Electronic stationery	Electronic dictionary, e-book reader, Translator, Calculator, etc.	D 2	d 2	0	2	2	0	0	0	0	0	0
Other MME	Entertainment / Education	Electronic toy	Game console, Game pad, toy drone, etc.	Y 2	y 2	0	1	1	1	4	5	0	1	1
Other MME	Entertainment / Education	Other Entertainment / Education equipment	Navigator, AI robot, etc.	F 2	f 2	1	0	1	0	0	0	0	0	0
Other MME	Other MME		MME other than the above	O 2	o 2	3	0	3	5	6	11	13	3	16
Total						117	284	401	133	235	368	212	212	424

●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 members of application for registration 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 (January 2024 – March 2024)

R: Radiated EMI measurement facilities below 1GHz　C: AC-mains-ports-conducted EMI measurement facilities
T: Telecommunication-port-conducted EMI measurement facilities　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:
株式会社UL Japan	湘南EMC試験所 第1電波暗室	-	-	-	-	-	C-20167	2027/1/21	神奈川県平塚市めぐみが丘1-22-3	0463-50-6400
株式会社UL Japan	湘南EMC試験所 第1電波暗室 Test Volume 2 m & 3 m	-	-	-	-	-	G-20205	2027/1/21	神奈川県平塚市めぐみが丘1-22-3	0463-50-6400
株式会社UL Japan	湘南EMC試験所 第2電波暗室	-	-	-	-	-	C-20160	2027/1/21	神奈川県平塚市めぐみが丘1-22-3	0463-50-6400
株式会社UL Japan	湘南EMC試験所 第2電波暗室 Test Volume 2 m & 3 m	-	-	-	-	-	G-20203	2027/1/21	神奈川県平塚市めぐみが丘1-22-3	0463-50-6400
株式会社UL Japan	湘南EMC試験所 第2電波暗室 Test Volume 5 m	-	-	-	-	-	G-20204	2027/1/21	神奈川県平塚市めぐみが丘1-22-3	0463-50-6400
株式会社UL Japan	湘南EMC試験所 第3電波暗室 Test Volume 2 m & 3 m	-	-	-	-	-	G-20206	2027/1/21	神奈川県平塚市めぐみが丘1-22-3	0463-50-6400
株式会社UL Japan	湘南EMC試験所 第3電波暗室	-	-	-	-	-	C-20163	2027/1/21	神奈川県平塚市めぐみが丘1-22-3	0463-50-6400
株式会社UL Japan	湘南EMC試験所 第3電波暗室	-	-	-	-	-	T-20165	2027/1/21	神奈川県平塚市めぐみが丘1-22-3	0463-50-6400
株式会社UL Japan	湘南EMC試験所 第1シールドルーム	-	-	-	-	-	C-20162	2027/1/21	神奈川県平塚市めぐみが丘1-22-3	0463-50-6400
株式会社UL Japan	湘南EMC試験所 第2シールドルーム	-	-	-	-	-	C-20161	2027/1/21	神奈川県平塚市めぐみが丘1-22-3	0463-50-6400
株式会社UL Japan	湘南EMC試験所 第2シールドルーム	-	-	-	-	-	T-20163	2027/1/21	神奈川県平塚市めぐみが丘1-22-3	0463-50-6400
株式会社UL Japan	No. 10 サイト (10 m 電波暗室)						G-20202	2027/1/21	千葉県香取市虫幡1614番地	0478-88-6567
株式会社UL Japan	No. 10 サイト (10 m 電波暗室)	-	-	-	○	○	R-20209	2027/1/21	千葉県香取市虫幡1614番地	0478-88-6567

Company name	Equipment name	3 m	10 m	30 m	Dark 3m	Dark 10m	Registration number	Effective date	Location	Contact to:
株式会社UL Japan	No. 10 サイト (10 m 電波暗室)	-	-	-	-	-	C-20159	2027/1/21	千葉県香取市虫幡1614番地	0478-88-6567
株式会社UL Japan	No. 10 サイト (10 m 電波暗室)	-	-	-	-	-	T-20161	2027/1/21	千葉県香取市虫幡1614番地	0478-88-6567
株式会社エムジー	3 m法電波暗室	-	-	-	-	-	G-20208	2027/1/21	京都府木津川市州見台８丁目２番３号	0774-75-1172
BTL Inc.	SSL-C01	-	-	-	-	-	C-20168	2027/1/21	Room 108, Building 2, No. 1 yile Road, Songshan Lake Park, Dongguan city, Guangdong Province, China	+86-769-8318-3000
BTL Inc.	SSL-C01	-	-	-	-	-	T-20170	2027/1/21	Room 108, Building 2, No. 1 yile Road, Songshan Lake Park, Dongguan city, Guangdong Province, China	+86-769-8318-3000
Eurofins TA Technology (Shanghai) Co., Ltd.	10 m Chamber	-	-	-	-	○	R-20208	2027/1/21	Building 3, No. 145, Jintang Rd, Pudong Shanghai, China	+86-21-5079-1141-8801
Eurofins TA Technology (Shanghai) Co., Ltd.	10 m Chamber	-	-	-	-	-	G-20201	2027/1/21	Building 3, No. 145, Jintang Rd, Pudong, Shanghai, China	+86-134-8262-5192
KSIGN TESTING CO., LTD.	KSIGN TESTING CO., LTD.	-	○	-	-	-	R-20213	2027/1/21	Building 5, No. 316, Jianghong South Road, Binjiang District, Hangzhou 310052, China	+86-131-7508-8000
株式会社UL Japan	湘南EMC試験所 第1電波暗室 Test Volume 5 m	-	-	-	-	-	G-20207	2027/2/19	神奈川県平塚市めぐみが丘1-22-3	0463-50-6400
株式会社UL Japan	湘南EMC試験所 第1電波暗室	-	-	-	○	○	R-20210	2027/2/19	神奈川県平塚市めぐみが丘1-22-3	0463-50-6400
株式会社UL Japan	湘南EMC試験所 第1電波暗室	-	-	-	-	-	T-20169	2027/2/19	神奈川県平塚市めぐみが丘1-22-3	0463-50-6400
株式会社UL Japan	湘南EMC試験所 第2電波暗室	-	-	-	-	-	T-20164	2027/2/19	神奈川県平塚市めぐみが丘1-22-3	0463-50-6400
株式会社UL Japan	湘南EMC試験所 第2電波暗室	-	-	-	○	○	R-20212	2027/2/19	神奈川県平塚市めぐみが丘1-22-3	0463-50-6400
株式会社UL Japan	湘南EMC試験所 第3電波暗室	-	-	-	○	-	R-20211	2027/2/19	神奈川県平塚市めぐみが丘1-22-3	0463-50-6400
株式会社UL Japan	湘南EMC試験所 第1シールドルーム	-	-	-	-	-	T-20162	2027/2/19	神奈川県平塚市めぐみが丘1-22-3	0463-50-6400

Company name	Equipment name	3 m	10 m	30 m	Dark 3m	Dark 10m	Registration number	Effective date	Location	Contact to:
株式会社UL Japan	湘南EMC試験所第3シールドルーム	-	-	-	-	-	C-20164	2027/2/19	神奈川県平塚市めぐみが丘1-22-3	0463-50-6400
株式会社UL Japan	湘南EMC試験所第3シールドルーム	-	-	-	-	-	T-20166	2027/2/19	神奈川県平塚市めぐみが丘1-22-3	0463-50-6400
株式会社UL Japan	湘南EMC試験所第5シールドルーム	-	-	-	-	-	C-20165	2027/2/19	神奈川県平塚市めぐみが丘1-22-3	0463-50-6400
株式会社UL Japan	湘南EMC試験所第5シールドルーム	-	-	-	-	-	T-20167	2027/2/19	神奈川県平塚市めぐみが丘1-22-3	0463-50-6400
株式会社UL Japan	湘南EMC試験所第6シールドルーム	-	-	-	-	-	C-20166	2027/2/19	神奈川県平塚市めぐみが丘1-22-3	0463-50-6400
株式会社UL Japan	湘南EMC試験所第6シールドルーム	-	-	-	-	-	T-20168	2027/2/19	神奈川県平塚市めぐみが丘1-22-3	0463-50-6400
株式会社UL Japan	No. 5 サイト（オープンサイト）	-	-	-	-	-	T-20172	2027/2/19	千葉県香取市虫幡1614番地	0478-88-6567
株式会社UL Japan	No. 5 サイト（オープンサイト）	-	○	-	-	-	R-20214	2027/2/19	千葉県香取市虫幡1614番地	0478-88-6567
株式会社UL Japan	No. 11 サイト (3 m 電波暗室)	-	-	-	-	-	G-20210	2027/2/19	千葉県香取市虫幡1614番地	0478-88-6567
株式会社UL Japan	No. 11 サイト (3 m 電波暗室)	-	-	-	-	-	T-20173	2027/2/19	千葉県香取市虫幡1614番地	0478-88-6567
ソニーグローバルマニュファクチャリング＆オペレーションズ株式会社	幸田　伝導妨害波測定設備 SR2	-	-	-	-	-	C-20174	2027/2/19	愛知県額田郡幸田町坂崎雀ケ入１	050-3809-3510
Compliance Certification Services Inc.	CCS Open Area Test Site No. I	-	○	-	-	-	R-20218	2027/2/19	No. 163-1, Jhongsheng Rd., Xindian Dist., New Taipei City 23151, Taiwan	+886-2-2217-0894
DEKRA Testing and Certification Co., Ltd.	AC1	-	-	-	-	○	R-20217	2027/2/19	No. 99, Hongye Road, Suzhou Industrial Park, Suzhou, 215006 P.R. China	+86-512-6251-5088
DEKRA Testing and Certification Co., Ltd.	TR1	-	-	-	-	-	C-20173	2027/2/19	No. 99, Hongye Road, Suzhou Industrial Park, Suzhou, 215006 P.R. China	+86-512-6251-5088
Sushi TOWE Wireless Testing (Shenzhen) Co., Ltd.	966 Chamber	-	-	-	○	-	R-20216	2027/2/19	F 401 and F 101 , Building E, Hongwei Industrial Zone, No. 6, Liuxian 3rd Road, Zone 70, Xingdong Community, Xin'an Street, Bao'an District, Shenzhen, China	+86-755-2721-2361

Company name	Equipment name	3 m	10 m	30 m	Dark 3m	Dark 10m	Registration number	Effective date	Location	Contact to:
Sushi TOWE Wireless Testing (Shenzhen) Co., Ltd.	966 Chamber	-	-	-	-	-	G-20211	2027/3/17	F 401 and F 101 , Building E, Hongwei Industrial Zone, No. 6, Liuxian 3rd Road, Zone 70, Xingdong Community, Xin'an Street, Bao'an District, Shenzhen, China	+86-755-2721-2361
Sushi TOWE Wireless Testing (Shenzhen) Co., Ltd.	Conducted Emissions Test Site	-	-	-	-	-	C-20172	2027/3/17	F 401 and F 101 , Building E, Hongwei Industrial Zone, No. 6, Liuxian 3rd Road, Zone 70, Xingdong Community, Xin'an Street, Bao'an District, Shenzhen, China	+86-755-2721-2361
Sushi TOWE Wireless Testing (Shenzhen) Co., Ltd.	Conducted Emissions Test Site	-	-	-	-	-	T-20174	2027/3/17	F 401 and F 101 , Building E, Hongwei Industrial Zone, No. 6, Liuxian 3rd Road, Zone 70, Xingdong Community, Xin'an Street, Bao'an District, Shenzhen, China	+86-755-2721-2361
BV 7Layers Communications Technology (Shenzhen) Co., Ltd.	3 m semi-anechoic Chamber	-	-	-	○	-	R-20220	2027/3/17	Room B37, Warehouse A5, No.3 Chiwan 4th Road, Zhaoshang Street, Nanshan District, Shenzhen, Guangdong, People’s Republic of China	+86-755-8869-6540
BV 7Layers Communications Technology (Shenzhen) Co., Ltd.	3 m semi-anechoic Chamber	-	-	-	-	-	G-20212	2027/3/17	Room B37, Warehouse A5, No.3 Chiwan 4th Road, Zhaoshang Street, Nanshan District, Shenzhen, Guangdong, People’s Republic of China	+86-755-8869-6540
BV 7Layers Communications Technology (Shenzhen) Co., Ltd.	563 Shelding room	-	-	-	-	-	C-20176	2027/3/17	Room B37, Warehouse A5, No.3 Chiwan 4th Road, Zhaoshang Street, Nanshan District, Shenzhen, Guangdong, People’s Republic of China	+86-755-8869-6540
Nemko Korea Co., Ltd.	3 m Chamber above 1 GHz	-	-	-	-	-	G-20213	2027/3/17	165-51, Yurim-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea	+82-31-330-1741
DEKRA Testing and Certification Co., Ltd.	FS-SR06	-	-	-	-	-	C-20177	2027/3/17	No. 85, Wenlin St., Linkou Dist., New Taipei City, Taiwan, R.O.C.	+886-2-8601-3788
DEKRA Testing and Certification Co., Ltd.	FS-SR06	-	-	-	-	-	T-20175	2027/3/17	No. 85, Wenlin St., Linkou Dist., New Taipei City, Taiwan, R.O.C.	+886-2-8601-3788
TestReal Quality Testing Technology (Shanghai) Co., Ltd.	Semi-anechoic chamber	-	-	-	○	-	R-20219	2027/3/17	Building 1, No. 279, Renqing Road, Pudong District, Shanghai, P.R. China	+86-183-1771-2911

Company name	Equipment name	3 m	10 m	30 m	Dark 3m	Dark 10m	Registration number	Effective date	Location	Contact to:
TestReal Quality Testing Technology (Shanghai) Co., Ltd.	Shielded chamber	-	-	-	-	-	C-20175	2027/3/17	Building 1, No. 279, Renqing Road, Pudong District, Shanghai, P.R. China	+86-183-1771-2911
株式会社UL Japan	No. 5 サイト（シールドルーム）	-	-	-	-	-	T-20171	2027/3/17	千葉県香取市虫幡1614番地	0478-88-6567
株式会社UL Japan	No. 5 サイト（シールドルーム）	-	-	-	-	-	C-20171	2027/3/17	千葉県香取市虫幡1614番地	0478-88-6567
株式会社UL Japan	No. 5 サイト（オープンサイト）	-	-	-	-	-	C-20170	2027/3/17	千葉県香取市虫幡1614番地	0478-88-6567
株式会社UL Japan	No. 6 サイト (3 m 電波暗室)	-	-	-	-	-	G-20209	2027/3/17	千葉県香取市虫幡1614番地	0478-88-6567
株式会社UL Japan	No. 11 サイト (3 m 電波暗室)	-	-	-	○	-	R-20215	2027/3/17	千葉県香取市虫幡1614番地	0478-88-6567
株式会社UL Japan	No. 11 サイト (3 m 電波暗室)	-	-	-	-	-	C-20169	2027/3/17	千葉県香取市虫幡1614番地	0478-88-6567
株式会社UL Japan	本社EMC試験所 第1電波暗室	-	-	-	○	○	R-20221	2027/3/17	三重県伊勢市朝熊町4383番326	0596-24-7483
株式会社UL Japan	本社EMC試験所 第1電波暗室 (Test volume 2 m)	-	-	-	-	-	G-20214	2027/3/17	三重県伊勢市朝熊町4383番326	0596-24-7483
株式会社UL Japan	本社EMC試験所 第1電波暗室	-	-	-	-	-	C-20178	2027/3/17	三重県伊勢市朝熊町4383番326	0596-24-7483
株式会社UL Japan	本社EMC試験所 第1電波暗室	-	-	-	-	-	T-20177	2027/3/17	三重県伊勢市朝熊町4383番326	0596-24-7483
株式会社UL Japan	本社EMC試験所 第2電波暗室	-	-	-	○	-	R-20222	2027/3/17	三重県伊勢市朝熊町4383番326	0596-24-7483

Closing words

About *anko* (red bean paste):

I like *anko*. I like it better than chocolate, and better than custard cream.

According to the Japanese Wikipedia:

"The character '*an*' originally means 'stuffing'. In China, this strongly evokes side dishes containing mincemeat or vegetable stuffing. In China, red bean paste made from *azuki* beans is known as 'dòu shā', and is said to have begun spreading in the Tang dynasty. Apparently, Japan had only '*shioan*' or salted red bean paste at first, after which sweet red bean paste emerged during the Azuchi-Momoyama period. Sugar is said to have come into use in the mid-Edo period, but was only available to the nobility."

According to the official website of the Japan Anko Association (of which I am a member and "*an-bassador*"):

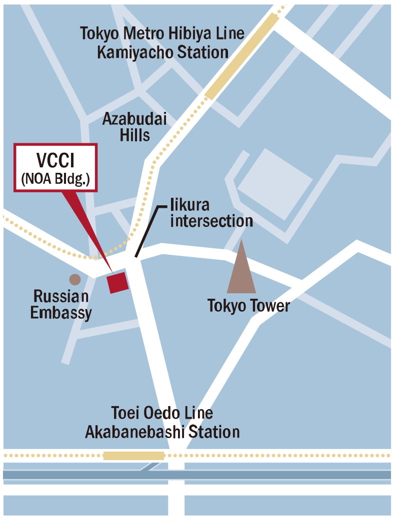
"The prototype of *anko* is said to have spread during the Asuka period. It was introduced from China by Japanese envoys to the Sui dynasty. At the time, the word also referred to meat or vegetable stuffing, such as that used in steamed buns. Later, due to the activities of those such as Zen monks who abstained from meat, the current form of *anko* made from *azuki* beans was born. At the time, however, the salty variety was still the norm. It was not until the Edo period that commoners would have the opportunity to taste sweet anko."

Returning to our subject, as an *anko* lover, I enjoy the various aspects of the *anko* world: the ever-raging debate between *tsubu-an* (using whole beans) and *koshi-an* (using mashed beans), and the variety of preferences such as *shiro-an* (using white beans), *uguisu-an* (using green peas), and *sakura-an* (mixed with cherry blossoms). However, I confess that I prefer *azuki*-bean *tsubu-an* (with *koshi-an* as a close second), a less sweet version of *anko* with a hint of saltiness. I'll eat it in any dish: *mochi* (pounded rice cakes), steamed buns, *taiyaki* (fish-shaped cakes), *dorayaki* (*anko* sandwiched between castella-sponge pancakes), *yokan* (sweet bean jelly), shaved ice, ice-cream *monaka* (rice wafer), *oshiruko* (sweet porridge)...The possibilities are endless. As for drinks to pair with the *anko*, you can't go wrong with *sencha* (infused green tea), *matcha* (powdered green tea), or *hojicha* (roasted green tea).

As I'm also fond of alcohol, I've been curious lately about pairing *anko* with booze.

When I was young, I would have balked at eating sweets with liquor, but as I get older, I'm becoming open to the idea. I'd love to learn the pleasures of a more sophisticated palate, like serving Japanese *nihonshu* or whisky with steamed buns or *yokan*.

(Y.H.)



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