

# IVAT Newsletter

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## IVAT

is the abbreviated name for the Institute of High Voltage and High Current, or in Malay, Institut Voltan dan Arus Tinggi – a Centre of Excellence of Universiti Teknologi Malaysia (UTM).

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IVAT welcomes visitors

## 2016 MyHVnet Colloquium Successfully Held



Photo taken during 2016 MyHVnet Colloquium.

JOHOR BAHRU, 25 January 2016 – The 2016 Malaysian High Voltage Network (MyHVnet) Colloquium was successfully held at the Faculty of Electrical Engineering, Universiti Teknologi Malaysia, Johor Bahru on 25 January 2016. The colloquium, being a biennial key event by MyHVnet, was organised with an aim to promote networking among academicians, indus-

trialists, and students in Malaysia for the effective communication of high voltage related research and development. The Institute of High Voltage and High Current of Universiti Teknologi Malaysia was the host institution for this very first colloquium since MyHVnet's

(continued on page 2...)

## Knowledge Sharing Session with Professor A. Manu Haddad



Professor Manu Haddad delivering his talk on "Advanced High Voltage Engineering Research and Future Challenges."

JOHOR BAHRU, 16 May 2016 – Knowledge sharing sessions with Professor A. Manu Haddad of the Cardiff University, United Kingdom was held at the Faculty of Electrical Engineering (FKE), University Teknologi Malaysia. The first knowledge sharing session was held on 14 May 2016 between Professor Haddad and research students of IVAT, where students of IVAT had the opportunities to get advice from Professor Haddad on their

(continued on page 5...)

## IVAT Director's Remark



# Prof. Dr. Zulkurnain Abdul Malek, Director, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

I am delighted that we are able to meet again in IVAT Newsletter. In this issue, news happening between June 2015 and May 2016 are highlighted. For the past one year, IVAT had notably achieved the followings: obtained Malaysian Standard International Organisation for Standardisation/International Electrotechnical Commission (MS ISO/IEC) 17025 accreditation for its testing services; appointed as an MS ISO/IEC 17025 consultant for Wireless Communication Centre and Aeronautical Laboratory of Universiti Teknologi Malaysia (UTM); signed Letter of Cooperation (LOC) with Universiti Lancang Kuning, Indonesia; hosted the maiden Malaysian High Voltage Network (MyHVnet) Colloquium; secured the chairmanship (Dr. Yanuar Zulardiansyah Arief) of the Institute of Electrical and Electronics Engineers Dielectrics and Electrical Insulation Society (IEEE DEIS) Malaysia Chapter; secured the visiting status at several overseas universities; and scored excellent performance in MyRAI audit for 2015. IVAT also received a working visit by the Vice Chancellor of UTM, Prof. Datuk Ir. Dr. Wahid Omar on 9 March 2016.

In line with the university's latest development and as part of its strategy, IVAT has realigned its strategic thrust from becoming a well-known Research and Innovation-based Centre of Excellence (CoE) into becoming a well-known Service-based CoE. Several initiatives have been made to achieve the desired state of CoE as a Higher Institution Centre of Excellence (HICoE) latest by 2017. These include the enhancement of IVAT's consultancy work, such as training and testing services.



IVAT's photo session during 2015 Hari Raya Aidilfitri.

I would like this opportunity to thank each and everyone of IVAT's staff for their full cooperation and relentless effort in heightening IVAT's reputation globally. Given the challenge for IVAT to achieve a HICoE status by

2017, we must transform our mindsets for IVAT to leap forward, especially in terms of financial returns. Let's work it out together.

(... continued from page 1)

informal inception in 2015 by members from various Malaysian organisations, including Tenaga Nasional Berhad Research Sdn. Bhd., AM SGB Sdn. Bhd. Universiti Sains Malaysia, Universiti Malaya, Universiti Putra Malaysia, Universiti Teknologi Malaysia, Universiti Malaysia Pahang, Universiti Malaysia Perlis, Universiti Malaysia Sabah, Universiti Teknikal Malaysia Melaka, Universiti Tun Hussein Onn Malaysia, Universiti Tenaga Nasional, and Universiti Kuala Lumpur.

The 2016 MyHVnet Colloquium featured five technical tracks, i.e., lightning, insulation and electrical discharges, condition monitoring, transformers, and other high voltage related areas. For this, five invited talks associated with the tracks were delivered by working professionals from various Malaysian organisations. They are "Challenges in Condition Monitoring" by Dr. Hidayat Zainuddin from Universiti Teknikal Malaysia Melaka, "Asset Management of Transformer Fleet: An Overview" by Mr. Mohd Aizam Talib from Tenaga Nasional Berhad Research, "Comparison of Partial Discharge Models in Condition based

Monitoring" by Dr. Hazlee Illias from Universiti Malaya, "The Evaluation of Lightning Return Stroke Current Using Measured Field" by Dr. Mahdi Izadi from Universiti Putra Malaysia, and "Partial Discharge Location Technique for Covered-conductor Overhead Distribution Line" by Dr. Muzamir Isa from Universiti Malaysia Perlis. In addition, the colloquium received 71 extended abstracts for oral presentations by academicians, industrialists, and students from various organisations across Malaysia; the total number of registered participants was 104.

MyHVnet wishes to thank all the participants of the colloquium for sharing their work on high voltage engineering during the colloquium. MyHVnet would also like to acknowledge the committee members for their voluntary efforts and contributions for making the colloquium a success. MyHVnet Colloquium will be held again in two years' time – see you again then!

More details on MyHVnet is available at <http://ivat.utm.my/myhvnet/>

# Dr. Lau Kwan Yiew, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

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## Research Collaboration Talk SIT-IVAT

JOHOR BAHRU, 23 February 2016 – On 23 February 2016, two members of IVAT's staff, Dr. Mohd Hafizi and Dr. Zulkurnain visited High Voltage and Power Equipment Laboratory, Shibaura Institute of Technology (SIT), Tokyo, Japan to have a discussion with the Head of the laboratory, Prof. Satoshi Matsumoto on potential projects for future collaboration between the institute and IVAT. Prior to the discussion session, Prof. Matsumoto accompanied both of them for a visit to the laboratory, exposing them to the current research conducted in the laboratory.



Discussion session with Prof. Satoshi Matsumoto.

One of the suggested projects was a study related to the relationship of dissolved gas analysis, Fourier transform infrared and Terahertz spectroscopy for insulating oil condition monitoring. Both parties agreed to have an official research collaboration in nearest future as a step to accelerate the researches in the suggested area and also as a way forward for strengthening the relationship between both parties.

The collaboration discussion was initiated in conjunction with the 10<sup>th</sup> South East Asian Technical Universities Consortium Symposium (SEATUC), which was held in SIT between 22 and 24 February 2016. Both members of IVAT's staff were attending the symposium and presenting total of three research papers entitled "Cyclability Performance of Electric Double Layer Capacitor with Glass Wool Separator", "Performance Study of Supercapacitor-Battery Integra-

tion Scheme for Energy Storage System" and "Effect of Humidity and Nanofiller on Self-Healing Properties of Silicone Rubber". The SEATUC symposium, which was initiated by SIT since 2007, is an international symposium, that provides an opportunity for prominent re-

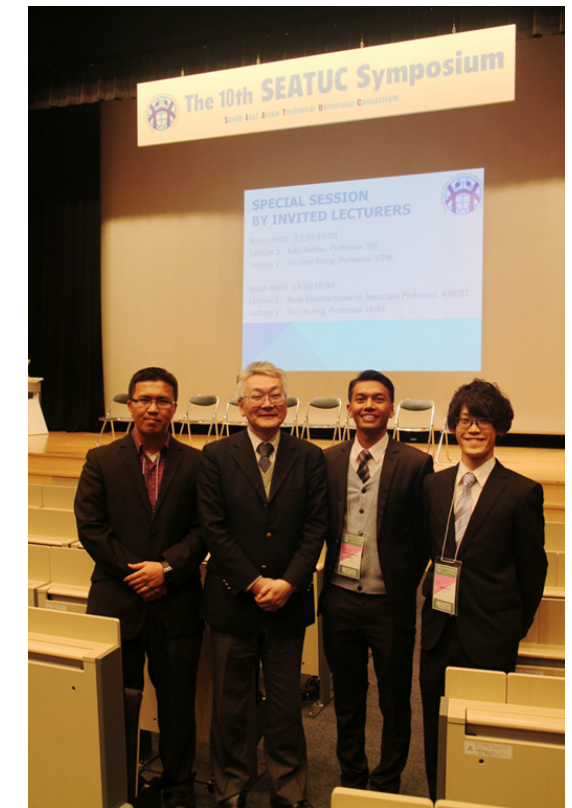


Photo taken during the 10<sup>th</sup> SEATUC Symposium.

searchers, engineers and practitioners who serve as faculty members of SEATUC member universities - Hanoi University of Science and Technology, Ho Chi Minh City University of Technology, Institut Teknologi Bandung, Shibaura Institute of Technology, Suranaree University of Technology, Universitas Gadjah Mada, Universiti Teknologi Malaysia, and King Mongkut's University of Technology Thonburito - to present latest research.

# Dr. Zulkurnain Ahmad Noorden, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

## Research Collaboration Talk with TNBR

JOHOR BAHRU, 23 May 2016 – IVAT continues to interact closely with the industry. This time, IVAT and Tenaga Nasional Research Berhad (TNBR) is looking into possible collaborations on the development of a new prototype for self-blast high voltage circuit breaker. More details to follow soon.

# Staff, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.



Photo taken during discussion.

## IVAT Initiates Its Own Postgraduate Seminar

JOHOR BAHRU, 26 April 2016 – In an effort to achieve Universiti Teknologi Malaysia's aspiration to have 70 per cent of its doctoral students to graduate within six semesters of the study, i.e., "graduate-on-time", IVAT has initiated a seminar called IVAT's Postgraduate Seminar. The seminar is scheduled to happen once every four months or thrice a year, involving all IVAT's doctoral students. The main aim of the seminar is to ensure that the students have made sufficient progress throughout their study to "graduate-on-time". A knowledge sharing session between presenters, audience and panels is expected during the seminar in such a way that could motivate and inculcate the students to take appropriate action to complete their study as planned.

The first IVAT's Postgraduate Seminar was held on 26 April 2016 and 3 May 2016, for the first and second sessions, respectively. In both sessions, there were a total of 10 doctoral students attended and presented their current research progress and future plans for their research. Each presenter was evaluated accordingly by two academic panels, which were among IVAT's academic staff. The presentations cover various research topics focusing on high voltage research areas such as lightning characterisation, lightning grounding improvement, high voltage plasma treat-

ment application, monitoring techniques for gas insulating systems, nanofluid and nanodielectric applications, evaluation of mineral oil as an insulating oil and food treatment based on pulse electric field. The students attained mean-



Discussion session between presenters, panels and audience.

ingful discussion not only with the panels, but also among the presenters and audience. It is expected that with such an effort, more IVAT's doctoral students will be able to "graduate-on-time" in the future.

# Dr. Zulkarnain Ahmad Noorden, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

## "ISO/IEC 17025 Awareness Course" Anjuran IVAT

JOHOR BAHRU, 4 Mei 2016 – Universiti Teknologi Malaysia (UTM) menggalakkan setiap makmal mendapatkan akreditasi dalam menghasilkan makmal yang berkualiti dan mendapat kepercayaan daripada pelanggan. Bagi tujuan tersebut, IVAT yang telah memperoleh "International Organisation for Standardisation (ISO)/International Electrotechnical Commission (IEC) Guide 25" pada tahun 1992 (institusi pertama di Malaysia) dan "ISO/IEC 17025" pada tahun 2004 telah menganjurkan "ISO/IEC 17025 Awareness Course" bertempat di Bilik Mesyuarat Utama IVAT, Fakulti Kejuruteraan Elektrik, UTM Johor Bahru. Peserta-peserta dari Wireless Communication Centre (WCC), Fakulti Kejuruteraan Elektrik telah menghadiri latihan tersebut pada 26 April 2016 manakala peserta-peserta dari Makmal Aeronautik, Fakulti Kejuruteraan Mekanikal telah menghadiri latihan tersebut pada 3 Mei 2016. Kedua-dua latihan tersebut diadakan bagi tujuan membantu mereka mendapatkan akreditasi ISO/IEC 17025 dari Jabatan Standard Malaysia. Pelbagai penerangan telah diberikan oleh Pengarah IVAT,



Gambar semasa kursus.

Profesor Dr. Zulkurnain Abdul Malek dari segi pemahaman mengenai akreditasi ini, dari segi tanggungjawab setiap staf, teknikal, dokumentasi dan lain-lain. Di akhir latihan tersebut, setiap peserta telah diberi ujian ringkas bagi menguji pemahaman mereka.

# En. Mohd Nazren Mohd Ghazali, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

## IVAT's Staff Won Gold at ITEX 2016

JOHOR BAHRU, 16 May 2016 – IVAT's staff, Assoc. Prof. Dr. Mohamed Afendi Mohamed Piah won a gold award for his product "Polarisation and Depolarisation Current Analyser for Material Condition Monitoring" in the 26<sup>th</sup> International Invention and Innovation Exhibition (ITEX) held at Kuala Lumpur Convention Centre from 12 to 14 May 2016. Congratulations!

# Staff, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

Right: Dr. Mohamed Afendi Mohamed Piah (middle) and Dr. Nor Asiah Muhamad (right) with their student.

Bottom: Recipients of awards at ITEX 2016.



## IVAT's Research Featured in Utusan Malaysia

JOHOR BAHRU, 23 May 2016 – IVAT's staff, Dr. Nor Asiah Muhamad had her research featured in Utusan Malaysia, a local newspaper. The research was on the use of palm oil in transformers. For more details, please refer to the article published in Utusan Malaysia on 23 May 2016.

# Staff, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

Source: Utusan Malaysia, 23 May 2016.



(... continued from page 1)

respective research projects. The second knowledge sharing session was held on 16 May 2016 between Professor Haddad and the academic staff of the Department of Electrical Power Engineering, FKE, where Professor Haddad delivered his talk entitled "Advanced High Voltage Engineering Research and Future Challenges." IVAT and FKE wish to thank Professor Haddad for his visit and kind sharing during the visit.

# Staff, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.



Professor Manu Haddad (sitting, middle left) and Professor Zulkurnain Abdul Malek (sitting, middle right) with academic staff and students.

# High Voltage Calibration, Testing, Consultancy, Training, Research and Development at Institute of High Voltage and High Current, Universiti Teknologi Malaysia

## Introduction

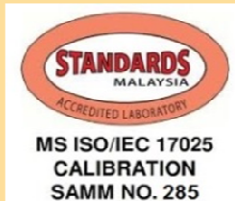
- The Institute of High Voltage and High Current, or in Malay, Institut Voltan dan Arus Tinggi (IVAT), was established in Universiti Teknologi Malaysia in 1991
- IVAT's establishment stems from the need of the country for a centre which carries out research and development, testing and calibration work, and training in the field of high voltage engineering
- IVAT is a laboratory accredited under the Laboratory Accreditation Scheme of Malaysia and meets the requirements of MS ISO/IEC 17025:2005 (general requirements for the competence of testing and calibration laboratories)

## Accredited Calibration and Testing Services



Ensure the reliability of your high voltage equipment through

### Accredited Calibration & Testing Services



#### Accredited scope of calibration:

- AC – up to 180 kV rms
- DC – up to 180 kV
- Impulse – 50 kV to 140 kV
- High current – up to 1000 A



#### Accredited scope of testing:

- Power cable AC voltage withstand test from 2 kV to 180 kV at 50 Hz

## Research and Development

IVAT has 2 main research divisions covering comprehensive research on high voltage engineering:

### Lightning Research and Safety Division:

- Lightning monitoring, detection, and protection system
- Lightning characterization, electromagnetic field, and radio frequency emission
- Overvoltage protection system and insulation co-ordination, measurement techniques, surge arresters, and magnetic engineering
- Grounding system improvement and measurement method
- Super capacitor application in high voltage systems
- Electromagnetic compatibility and interference in high voltage systems



### Dielectrics, Discharges and Diagnostics Division:

- Electrical discharge, detection, and monitoring
- Partial discharge analysis on polymeric insulating materials
- Condition monitoring of high voltage equipment
- Diagnosis and fault analysis
- Forensic investigation
- Material assessment
- Plasma and ozone generation applications
- Low voltage and telecommunication surge protective devices

## Consultancy and Training Services

IVAT offers consultancy services for the following areas:

- Laboratory accreditation based on MS ISO/IEC 17025: 2005
- Lightning protection systems for buildings
- Protection systems for electrical power networks
- Grounding systems installations
- High voltage product development
- Low voltage and telecommunication surge protective devices

IVAT also organises training, visits, workshops, seminars and short courses. Some popular modules include:

- Electrical Safety Seminar
- Fundamentals of High Voltage Technology
- Three-day Short Course on High Voltage Testing Techniques and Safety
- Two-day Short Course on Grounding Systems
- Short Course on Lightning Protection for High and Low Voltage Systems
- Short Course on Partial Discharge Phenomena

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## Industrial Visit to Universal Cable

JOHOR BAHRU, 29 November 2015 – An industrial visit to Universal Cable (M) Sdn. Bhd. was organised for undergraduate students of the Faculty of Electrical Engineering, Universiti Teknologi Malaysia on 29 November 2015. The company is located about 20 km from Universiti Teknologi Malaysia in the industrial area of Tebrau, Johor Bahru. The trip, coordinated by Dr. Noor Azlinda Ahmad, was organ-



Main entrance of Universal Cable, Tebrau, Johor Bahru.

ised to fulfil one of the requirements of the faculty's undergraduate subject – Introduction to Electrical Engineering. The main objectives of the visit were to expose students to the real working environment as electrical engineers, to give exposure and knowledge to students on the manufacturing of high voltage cables and to increase students' awareness on challenges that they are likely to face in real working lives.

At the very beginning of the visit, the students were greeted by the General Manager of the company, Mr. Fadzil Ahmad. The students were then provided a brief introduction about the company. After the briefing, the students were divided into two groups, where each group

was taken to the production area to witness the production of a cable. Generally, there are several steps involved in the production of a cable. The first step is called the stranding process, followed by the insulation process for



Students listening to engineers during the visit.

filling a compound to the cable. The next step involves the jacketing process where a cable core is protected by a metal sheathing of either aluminium or aluminium and steel combinations. The final step is called the detection process, where the cable is wound onto metal or wooden reels prior to transporting to the final testing facility.

The trip was beneficial for all the students as it exposed the students to the manufacturing process of high voltage cables and the working lives of engineers there. The visit ended with Dr. Noor Azlinda presenting gifts to the company representative as a token of appreciation. Dr. Noor Azlinda would also like to take this opportunity to thank the company for entertaining the visit and the light refreshments served during the visit.

# Dr. Noor Azlinda Ahmad, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

## IVAT's Discharges, Dielectrics and Diagnostics Division

JOHOR BAHRU, 30 April 2016 - Discharges, Dielectrics and Diagnostics Division has recently been formed in IVAT by the merger of the previous Dielectrics and Electrical Insulation Division and High Voltage Condition Monitoring and Diagnostics Division. The new division focuses on the following research areas:

- Electrical Discharge, detection, and monitoring

- Partial discharge analysis on polymeric insulating materials
- Condition monitoring of high voltage equipment
- Diagnosis and fault analysis
- Forensic investigation
- Material assessment
- Plasma and ozone generation applications
- Low voltage and telecommunication surge protective devices

# Staff, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

## Invited Lecture for Fire Investigation Division, State of Johore Fire and Rescue Department

JOHOR BAHRU, 21 October 2015 – Staff from the Faculty of Electrical Engineering, Universiti Teknologi Malaysia was invited to give a lecture on Electrical Safety by the Fire Investigation Division, State of Johore Fire and Rescue Department for their teams of investigators from districts of Johor. The course entitled "Kursus Asas Elektrikal dan Pengendalian Bahan Bukti Makmal Penyiasatan Kebakaran" (Electrical Basics and Handling of Fire Investigation Laboratory Evidence) was conducted on 18th to 20th October 2015 at the Johore Fire and Rescue Department headquarters in Tebrau, Johore.

The aim of the electrical basics part is to expose the technical concept of short circuit events and electrical shock. Dr. Zuraimy of IVAT was invited to give a 6-hour lecture inclusive of the technical aspects of the air conditioning systems. The lecture was conducted mainly based on the engineering/scientific reasons on each preventive measures of short circuit and electrical shock. The Question and Answer session was quite lengthy as participants needed a lot of explanation on their own experiences during investigations related to electrical fire. A question on how to classify the ratings of a Moulded Case Circuit Breaker (MCCB) remained from a fire incident was one of the interesting questions addressed.

On the last day of the course, the session was ended at the IVAT, Faculty of Electrical Engineering, Universiti Teknologi Malaysia, Skudai, with a 4-hour visit. The visit was complemented by a few demonstrations of electrical

arcings/sparks and an analytical walk through of an actual fire scene which occurred 6 months before.

The collaboration was so successful that it led to an



Demonstration session at IVAT.

idea of providing the same course content to investigators from other states in the Peninsular of Malaysia organised by the Fire Investigation Division, State of Johore Fire and Rescue Department. With careful planning and revisions, the same course content would be suitable to other Government Bodies. The Faculty and the Institute looks forward for future courses tailored for other Government Forces. Please contact the Dean of the Faculty of Electrical Engineering for enquiries.

# Dr. Zuraimy Adzis, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.



Group photo.

# Notes of Appreciation

JOHOR BAHRU, 01 May 2016 – Ceremonies were held by IVAT to bid farewell to its two members of academic staff, Dr. Nouruddeen Bashir Umar and Dr. Muhamad Abu Bakar Sidik on the 30<sup>th</sup> March and 19<sup>th</sup> April 2016, respectively. It was a feeling of sadness to see them leaving, and yet happiness to see them extending their career boundaries. Both Dr. Nouruddeen and Dr. Abu Bakar joined IVAT almost 6 years ago after completing their studies at Universiti Teknologi Malaysia. It is a fortunate opportunity to see them grow over the years into a valuable member of our team. Most of us who have worked with them have found them to be a very conscientious, professional and hard-working colleagues. Their outgoing and friendly personality helped to create a pleasant environment to work with and their contributions have been a great benefit to IVAT. Hence, undeniably they will be deeply missed.

*“Dear Dr. Nouruddeen and Dr. Muhamad Abu Bakar, thank you so much for your dedication. You will go away but your morals, ethics and advice will always stay with us. We will definitely miss you but this isn’t goodbye as we know you will keep in touch and we will see you sooner rather than later. Thank you for everything you have given to IVAT. We sincerely wish you all the best in your future transactions. Farewell!!!”*

# Dr. Noor Azlinda Ahmad, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.



Professor Dr. Zulkuranain Abdul Malek hand in some token of appreciation to Dr. Muhammad Abu Bakar Sidik (top) and Dr. Nouruddeen Bashir Umar (bottom)



Dr. Muhammad Abu Bakar Sidik (sitting, fifth from left) with IVAT’s staff.



Dr. Nouruddeen Bashir Umar (sixth from right) with IVAT’s staff.

# Other Happenings at IVAT



Surveillance audit by Standards Malaysia in May 2016.



Participation in SEATUC in January 2016.

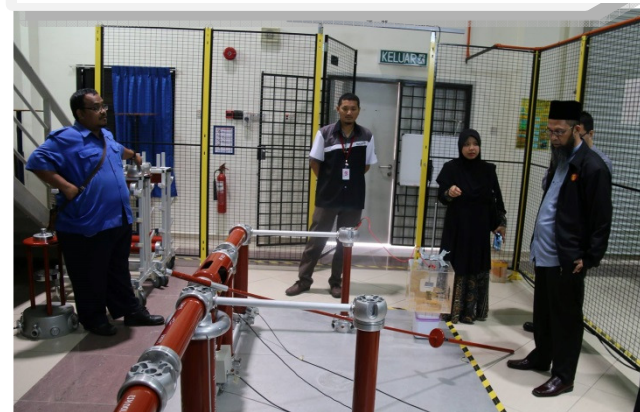


Signed letter of cooperation with Universitas Lancang Kuning, Indonesia in May 2016.

Collaboration discussion with Tianu Sdn. Bhd. in May 2016.



Visit by the Vice Chancellor of Universiti Teknologi Malaysia in March 2016.



Visit to Universiti Tun Hussein Onn Malaysia in September 2015.



IVAT’s strategic planning and ISO preparation workshop in August 2015.



Awarded certificate for ISO accreditation in testing by the Vice Chancellor of Universiti Teknologi Malaysia in June 2015.



IVAT students’ participation in IEEE DEIS Malaysia workshop in April 2016.



Signed letter of cooperation with Malaysian Association of Standards Users in June 2015.

# Welcome to IVAT

IVAT is committed to entertain visits by delegates from not only its own university, but also as far as overseas. The main aim for IVAT organising visits is to share their research, services and consultancy experience to as many people as they could, especially in areas relevant to high voltage engineering.

For interested students from schools or higher learning institutions, the focus of visit would be on IVAT's role in building the nation through their technical support to electrical energy industries to achieve reliable and efficient operations. This is inculcated through their fascinating demonstration on high voltage air discharges (either impulsive or sustainable low current arcs).

For representatives from private companies, IVAT showcases their services and consultancy capabilities, as well as their research achievements, in attempts to increase the return of investments to the university. As for executives of ministerial bodies and government parastatals, IVAT extends their knowledge and experience to open possible collaborations on research works.

A routine visit to IVAT would include a 5-minute video presentation on IVAT, followed by a 10-minute briefing by an IVAT's academician, then a question-and-answer session on any topic relevant to the visit. Interested parties are most welcome to visit IVAT.



Photos taken during various visits to IVAT.



**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA

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The Institute of High Voltage and High Current, or in Malay, Institut Voltan dan Arus Tinggi (IVAT), was established in Universiti Teknologi Malaysia in 1991. It was initially an educational laboratory which provides facilities for carrying out experiments, research and consultancy services in high voltage engineering, as early as the 1970s.

The establishment of IVAT stems out from the needs of the country for a centre which carries out research and development, test and calibration works in high voltage areas, so that efficient technologies and power system apparatus can be effectively employed for the transmission and distribution to the consumer of electrical energy.

In 1992, the institute became the first institution in the country to be accredited to handle high voltage test and calibration works according to ISO/IEC Guide 25. In 2004, IVAT was accredited with the ISO/IEC 17025 in the field of high voltage electrical calibration. In certification, IVAT has also successfully migrated to MS ISO/IEC 17025 since July 2007 till date. Recently in 2013, IVAT was accredited with the on-site calibration and the scope of calibration had been extended up to 180 kV AC (alternating current), 180 kV DC (direct current) and 140 kV impulse.