IVAT Newsletter

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IVAT is the abbreviated name for the Institute of High Voltage and High Current, or in Malay, **I**nstitut **V**oltan dan **A**rus **T**inggi – a Centre of Excellence of Universiti Teknologi Malaysia (UTM).

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IVAT Strengthens Staff Competencies in Compliance with MS ISO/IEC 17025:2017

Group photo with Principal Consultant Ms. Anijah Pangat (sitting fourth from left)

JOHOR BAHRU, 09 May 2025 – IVAT has successfully organised a short course titled "Introduction and Implementation of MS ISO/IEC 17025: 2017 and Internal Auditing" at Pulai Springs Resort, Johor Bahru, as an upskilling and reskilling measure for its staff competencies in compliance with the standard.

The two-day course, managed by the Principal Consultant of SIRIM Academy, Ms. Anijah Pangat, aimed to provide intensive exposure to participants on the implementation and requirements of the MS ISO/IEC 17025: 2017

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IVAT Participates in Training-of-Trainers Workshop on Solar Photovoltaic

KOTA TINGGI, 25 February 2025 – IVAT successfully conducted a Training-of-Trainers (ToT) course and a Solar Photovoltaic (PV) exhibition at Sekolah Kebangsaan Mawai, Kota Tinggi. The event was part of IVAT's ongoing outreach initiative to promote renewable energy education and community-based knowledge transfer. The programme was attended by teachers, students, and representatives from selected primary schools in the Kota Tinggi area. IVAT staff delivered interactive training sessions focused on the fundamentals of solar PV technology, its applications, and the importance of renewable

IVAT's staff and student members at the workshop

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IVAT Director's Remarks

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

It is a privilege to reconnect through this newsletter and reflect on a year of remarkable progress. The past twelve months have been defined by persistent action and achievement.

We began by strengthening our foundation at our annual Management Review Meeting and Strategic Planning Workshop and invested in our team's expertise through specialised training. Our commitment to industry partnerships never wavered. We conducted high-voltage training sessions and participated actively in the Malaysian High Voltage Network (MyHVnet) colloquium and the IEEE Dielectrics and Electrical Insulation Society (DEIS) Malaysia Chapter.

Believing in learning by seeing, we toured leading industrial laboratories and factories, bridging the gap between academia and industry. Our staff elevated IVAT's global profile, serving as invited lecturers at international conferences and universities. Meanwhile, our institute became a hub for global dialogue, hosting a steady stream of visitors from local and international institutions. These were more than courtesy calls; they were the seeds of future collaboration, with promising talks initiated with partners worldwide.

Beyond the laboratories and lecture halls, we engaged the wider community through corporate social responsibility initiatives, leveraging university resources for public benefit. As we turn the page to a new chapter, we do so with immense gratitude for your continued support and excitement for the future we will build together. The momentum is with us.

IVAT Hosts Technical Course on Lightning Protection

JOHOR BAHRU, 21 June 2025 – IVAT successfully organised a focused technical course titled "Protection Against Lightning for Floating Liquefied Natural Gas (FLNG)" on 19–20 June 2025. Held at the IVAT Seminar Room, the course was led by none other than Ir. Dr. Muhammad Abu Bakar Sidik, an esteemed alumnus of IVAT and currently a contract academic staff member. He also represents Universitas Sriwijaya, Indonesia.

Group photo with Dr. Muhammad Abu Bakar (fifth from left)

The two-day course drew attendance from IVAT staff, researchers, and postgraduate students. It explored the complexities and engineering solutions in lightning protection systems for offshore FLNG facilities - a topic gaining increased relevance in modern energy infrastructures.

Dr. Abu Bakar, known for his industrial expertise and academic background, shared critical insights into risk assessment, surge protection strategies, and international standards governing FLNG protection. His unique perspective as both a former IVAT postgraduate and an international expert brought valuable context and depth to the session.

The course also served as a platform for IVAT's internal capacity building, strengthening technical knowledge among staff while reconnecting with its global alumni network. Participants expressed appreciation for the relevance of the course and the opportunity to engage with real-world high-voltage protection issues.

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

IVAT Involves in Pivotal Collaboration Meeting with PETRONAS Representatives

Group photo

JOHOR BAHRU, 22 January 2025 – In a strategic move to strengthen academia–industry collaboration, the Faculty of Electrical Engineering at Universiti Teknologi Malaysia (UTM) hosted a high-level meeting with representatives from PETRONAS under the Collaboration with Higher Education Strategic Initiatives (CHESS) programme, bringing together key faculty members including Prof. Dr. Jafri (Dean), Assoc. Prof. Dr. Shahrin (Head of the Department of Electrical Power Engineering), Assoc. Prof. Ir. Dr. Junaidi, Assoc. Prof. Dr. Norzanah, Ts. Dr. Zulkarnain and Dr. Aizat from IVAT The PETRONAS delegation was represented by Mr. Munzir Mohd Daud, Mr. Noor Ekhsan Mohd Isnain, Ir. Nor Azhar, Ir. Khairil Nazhar, and Mr. Adri Thauriq, three of whom are distinguished alumni of the faculty, to explore collaborative opportunities focused on developing industry-ready talent, advancing research and innovation in sustainable energy, and aligning academic programmes with the skills and competencies required by the energy sector, in support of Malaysia's national goals for energy transition and human capital development, as envisioned by the CHESS initiative, which aims to bridge the gap between academic knowledge and industry demands and drive progress towards a low-carbon and sustainable future.

Ir. Ts. Dr. Aizat Azmi, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

IVAT's Commitment in MS ISO/IEC 17025:2017 Accreditation

Photo during training

(… continued from page 1)

Standard. These include laboratory audit competencies, audit planning and implementation of internal audits.

The organisation of the course reflects IVAT's commitment in strengthening the quality and compliance with international standards among academics, assistant engineers and administrative staff, in line with the university's desire to remain excellent in the field of high voltage technology.

Mr. Mohamad Syahrin Mohamad, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

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IVAT Research Fellows Delivers General Lecture at Universitas Sriwijaya

Group photo with Assoc. Prof. Dr. Mohd Hafizi and Dr. Norhafezaidi (eight and ninth from left)

PALEMBANG, INDONESIA, 18 February 2025 – On 17 February 2025, two representatives from IVAT were invited to deliver a general lecture at the Faculty of Engineering, Universitas Sriwijaya, Palembang campus. The event gathered faculty members and students from the Department of Electrical Engineering, all eager to explore the latest developments in the field.

The session began with opening remarks from Dr. Ir. Bhakti Yudho Suprapto, ST., MT., IPM, Dean of the Faculty of Engineering, who emphasised the importance of integrating theoretical knowledge with practical industry experience to enhance the university's academic and research standards.

Group photo with Dr. Ir. Bhakti Yudho (middle)

This was followed by a welcome address from Ir. Muhammad Abu Bakar Sidik, ST., M.Eng., Ph.D., IPU, Head of the Department of Electrical Power. He underscored the department's dedication to staying at the cutting edge of technology and fostering collaborations with industry experts to strengthen academic programs and research efforts.

The lecture highlighted IVAT's expertise in emerging technologies through two insightful presentations. Assoc. Prof. Ir. Ts. Dr. Mohd Hafizi Ahmad delivered a talk on "Partial Discharge: Theoretical and Industry", offering a comprehensive explanation of partial discharge phenomena, their impact on electrical insulation systems, and the importance of monitoring and mitigation to ensure equipment reliability. He also shared industry best practices, effectively linking theoretical concepts to real-world applications.

Dr. Norhafezaidi Mat Saman presented "Powering the Future with Plasma: Boundless Possibilities Await", exploring the immense potential of plasma technology in energy production, materials processing, and environmental sustainability. He discussed ongoing research and future directions, inspiring participants to think creatively about how plasma could support sustainable development.

The program concluded with an engaging Q&A session, where students and faculty actively exchanged ideas with the speakers. The strong interest in practical applications of partial discharge and plasma technologies reflects their relevance to current research and industrial challenges.

Dr. Norhafezaidi Mat Saman, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

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IVAT Strengthens Academic-Community Ties

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energy in achieving environmental sustainability.

One of the key highlights of the programme was the official handover of IVAT-sponsored solar PV kits to participating schools. These kits are intended to support hands-on learning and inspire students to explore science, technology, engineering, and mathematics (STEM) through real-world applications in solar energy. The ToT course equipped educators with essential knowledge and skills to effectively disseminate what they had learnt within their respective schools. The session covered practical demonstrations and teaching methodologies that could be easily adapted into the classroom setting.

The initiative is part of a broader effort to strengthen ties between academic institutions and local communities while fostering early awareness of clean energy solutions among the younger generation. This community engagement programme aligns with national goals to encourage the adoption of green technologies and reduce carbon emissions through education.

IVAT remains committed to supporting schools, educators, and students through targeted programmes that bridge the gap between academia and real-world applications, ensuring that future generations are well-prepared for the challenges and opportunities of a sustainable energy future.

Demonstration of solar PV kit

Dr. Noor Syazwani Mansor, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

IVAT Participates in Knowledge Transfer Programme on IoT Smart Farming

JOHOR BAHRU, 28 May 2025 – A Knowledge Transfer Program (KTP): Internet of Things (IoT) Smart Farming was successfully carried out at Sekolah Menengah Kebangsaan (SMK) Mutiara Rini to enhance educators' knowledge and skills in IoT and smart agriculture technologies. Co-organised by the IEEE Malaysia Section, IEEE Humanitarian Technologies Board, IEEE Power and Energy Society (PES) Malaysia Chapter, Universiti Teknologi Malaysia's Centre of Electrical Energy Systems (CEES), and IVAT, with sponsorship from IEEE Tech4Good, the programme aimed to transfer practical knowledge concerning microcontroller programming and IoT-based automation to school teachers. It also facilitated the deployment of a smart hydroponic farming system at the school, encouraging sustainable and technology-based agricultural practices. IVAT's representative Ir. Ts. Dr. Aizat Azmi acted as a facilitator throughout the programme, leading participants through hands-on sessions involving IoT device control, pump calibration, and automated fertilizer systems. Participants gained hands-on experience with mobile apps, sensors, and automation equipment, which provided them with the necessary skills to intergrate smart farming concepts into classroom instruction. Upon completion of the training, an evaluation was conducted to assess participant's understanding and ability to apply the concepts. Overall, the program succeeded in empowering educators with practical skills in smart agriculture, raising awareness and readiness to embrace contemporary farming technologies in education .

Group photo

Ir. Ts. Dr. Aizat Azmi, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

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Students of IVAT Successfully Defend PhD Theses

JOHOR BAHRU, 09 July 2025 – IVAT proudly congratulates the following candidates for successfully defending their PhD theses. Their success in their viva voces marks a significant academic milestone for them after years of rigorous research and dedication.

In April 2025, two viva sessions were successfully conducted. The viva voce for Mohd Ridhuan Mohd Sharip was held on 10 April 2025. Mohd Ridhuan's PhD thesis entitled "Electrical Insulation Characteristics of Polypropylene Blends and Nanocomposites" was supervised by Assoc. Prof. Eur. Ing. Ir. Ts. Dr. Lau Kwan Yiew (main supervisor) and Ts. Dr. Zulkarnain Ahmad Noorden (co-supervisor). On 24 April 2025, Nur Azalia Azrin successfully defended her PhD thesis entitled "Structure and Dielectric Properties of Polypropylene Blended with Polyolefin Elastomers and Treated Nanotitania" under the main supervision of Ts. Dr. Noor Azlinda Ahmad and co-supervision of Assoc. Prof. Eur. Ing. Ir. Ts. Dr. Lau Kwan Yiew.

Group photo with Mohd Ridhuan (third from left) after the viva session

Group photo with Nur Azalia (third from right) after the viva session

In May 2025, another two viva sessions were successfully held. On 21 May 2025, Siti Noorhazirah Kamarudin, under the main supervision of Assoc. Prof. Eur. Ing. Ir. Ts. Dr. Lau Kwan Yiew and co-supervision of Ts. Dr. Noor Azlinda Ahmad, succeeded in defending her PhD thesis entitled "Structure-Dielectric Properties of Polypropylene Blended with Ethylene-Octene Copolymers and Oxide-Based Nanofillers". Meanwhile, Nur Atikah Johari, under the main supervision of Assoc. Prof. Eur. Ing. Ir. Ts. Dr. Lau Kwan Yiew and co-supervision of Prof. Dr. Zulkurnain Abdul Malek and Dr. Mona Riza Mohd Esa, passed her viva on 28 May 2025, with her thesis entitled "Structure and Electrical Properties of Polypropylene and Ethylene-Propylene-Diene Monomer Blend Containing Magnesium Oxide and Calcium Zirconate Nanofillers".

Another viva session dated 08 July 2025 was conducted for Umar Ali Benisheikh, supervised by Prof. Dr. Zulkurnain Abdul Malek. Umar Ali successfully defended his PhD thesis entitled "Characterization and Diagnostic Condition Monitoring of Aged Glass Insulators Using Leakage Current an PCA-Based Intelligent Predictive Model".

Group photo with Siti Noorhazirah (third from right) after the viva session

Group photo with Nur Atikah (third from right) after the viva session

Group photo with Umar Ali (third from right) after the viva session

During the respective viva voces, the examination panels commended the candidates for the clarity of their presentation, the depth of their analysis, and the originality of their work. Their research findings are anticipated to contribute to both academic knowledge and industry practices particularly in high voltage engineering.

IVAT extends its heartfelt congratulations to all the candidates and wishes them every success in their future academic and professional endeavours. IVAT also thank the examination panels for dedicating their valuable time and effort in providing constructive feedback in upholding the quality of the candidates' PhD research.

Assoc. Prof. Eur. Ing. Ir. Ts. Dr. Lau Kwan Yiew, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

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IVAT Participates in 2025 Annual General Meeting of IEEE DEIS Malaysia Chapter

Group photo at KLCC

KUALA LUMPUR, 28 May 2025 – The Institute of Electrical and Electronics Engineers (IEEE) Dielectrics and Electrical Insulation Society (DEIS) Malaysia Chapter convened its 2025 Annual General Meeting (AGM) on 18 January 2025. The meeting was held both physically at the Kuala Lumpur Convention Center and virtually via Google Meet. The meeting was attended by 17 dedicated members, including IVAT's staff members, Ts. Dr. Zulkarnain Ahmad Noorden, Assoc. Prof. Eur. Ing. Ir. Ts. Dr. Lau Kwan Yiew, and Dr. Nur Aqilah Mohamad.

Group photo of the participants via Google Meet

Chaired by Chapter Chair Assoc. Prof. Ir. Dr. Norhafiz Azis, the AGM commenced with an opening remark, followed by the endorsement of the 2024 AGM minutes and the presentation of the previous year's activities. Treasurer, Dr. Nik Hakimi Nik Ali then presented account matters. The meeting concluded with a forward-looking discussion, outlining plans for activities in 2025.

Dr. Nur Aqilah Mohamad, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

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IVAT Conducts 2-Day Course on High Voltage Testing

Group photo

JOHOR BAHRU, 27 November 2024 – IVAT would like to extend its heartfelt thanks to everyone who participated in the Two-Day Course on High Voltage Testing, held on 25th –26th November 2024 at IVAT. The course was expertly conducted by Assoc. Prof. Ir. Ts. Dr. Mohd Hafizi Ahmad and Assoc. Prof. Ir. Dr. Mohd Hafiz Habi Buddin from the Centre of Electrical Energy System (CEES), Universiti Teknologi Malaysia, whose in-depth knowledge and engaging delivery greatly enriched the learning experience. Their sessions provided both a strong theoretical foundation and practical insights, which were highly appreciated by the participants.

Practical session

Throughout the two days, attendees explored a wide range of key topics, including the principles of high voltage

Lecture session

generation and measurement, insulation coordination, safety procedures, and testing techniques used in high voltage systems. The course also featured hands-on demonstrations using advanced testing equipment, allowing participants to apply theoretical knowledge in a practical setting. IVAT was especially encouraged by the high level of engagement and insightful questions posed during both the lecture and practical sessions. The feedback received was overwhelmingly positive, with many participants highlighting the quality of instruction and the relevance of the content to their professional roles.

Dr. Noor Syazwani Mansor, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

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IVAT's Research Fellow Invited as Keynote Speaker at ICAECT 2025 in India

BHILAI, INDIA, 11 January 2025 – Assoc. Prof. Eur. Ing. Ir. Ts. Dr. Lau Kwan Yiew, research fellow of IVAT, was invited as a Keynote Speaker at the 2025 IEEE 5th International Conference on Advances in Electrical, Computing, Communications, and Sustainable Technologies (ICAECT 2025). The conference took place from 09-10 January 2025 at Shri Shankaracharya Technical Campus (SSTC) in Bhilai, Chhattisgarh, India.

Assoc. Prof. Dr. Lau delivered an insightful keynote titled "Advanced Electrical Materials for Sustainable Energy Technologies". Sharing the spotlight was Dr. Jagadeesh G. from the School of Computer Science Engineering and Information Systems at Vellore Institute of Technology, Vellore.

ICAECT 2025 gathered professors, researchers, and scholars from around the world, offering a platform for the latest research results and emerging trends in Electrical, Electronics, and Computer Engineering. The conference included invited talks, pre-conference tutorials, workshops, and peer-reviewed paper presentations.

Assoc. Prof. Dr. Lau's involvement in this event not only highlights his expertise but also enhances the institute's reputation in the global academic and research community. It

Photo of Assoc. Prof. Dr. Lau (second from right) with another keynote speaker and organising committee members at ICAECT 2025

opens up opportunities for collaborations, strengthens institutional visibility, and reinforces the organization's commitment to advancing sustainable technologies and innovative research.

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

IVAT Showcases Services

JOHOR BAHRU, 14 March 2025 – In conjunction with the Deputy Vice-Chancellor (Research and Innovation)'s Mandate Ceremony held on 13 March 2025 at Dewan Sultan Iskandar, Universiti Teknologi Malaysia (UTM), IVAT showcased its research outputs, services, and consultancy offerings to industry and the community.

IVAT's staff at the exhibition booth

During the keynote address, Prof. Dr. Rosli Md Illias emphasised the importance of holistic and systemic knowledge development. He highlighted the concept of knowledge integration as a key approach in addressing global challenges, thereby strengthening UTM's position as a world-class research university towards achieving greater excellence by 2030.

Throughout the event, staff under the Department of Deputy Vice-Chancellor (Research and Innovation) were given the opportunity to visit exhibition booths set up by various responsibility centres, featuring their latest research and innovations. IVAT was also among the exhibitors, proudly presenting its research achievements and service offerings to all attendees. The exhibition served not only to highlight IVAT's expertise and capabilities, but also as a strategic platform for networking between researchers, industry players, and the wider community.

Mr. Mohamad Syahrin Mohamad, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

UTM
UNIVERSITI TEKNOLOGI MALAYSIA

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 17025:2017 (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

STANDARDS MALAYSIA ACCREDITED
SAMM 285

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

STANDARDS MALAYSIA ACCREDITED
SAMM 709

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 themes covering comprehensive research on high voltage engineering:

Lightning Research and Safety:

- 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:

- 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: 2017
- 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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IVAT Conducted 2024 Management Review Meeting

JOHOR BAHRU, 28 November 2024 – IVAT successfully held its management review meeting for its calibration laboratory at Hyatt Place Johor Bahru on 27 November 2024.

The management review meeting was carried out for IVAT's calibration laboratory accredited under the MS ISO/IEC 17025: 2017 standard. Various matters concerning the calibration activities of the laboratory were discussed. These included the review of the objectives and policies relevant to the laboratory, the analysis of risks and improvements related to the calibration jobs, and the implementation of corrective and preventive actions for the laboratory.

Group photo

All IVAT's staff members are thankful for participating in the fruitful workshop and look forward to a successful year ahead for IVAT's calibration activities.

Assoc. Prof. Eur. Ing. Ir. Ts. Dr. Lau Kwan Yiew, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

IVAT Participates in 2024 MyHVnet Colloquium

KAJANG, 13 August 2024 – The 2024 MyHVnet Colloquium took place at UNITEN Bangi on 12th August 2024, marking the fifth event organized by the Malaysian High Voltage Network (MyHVnet) with the IEEE Dielectric Electrical Insulation Society (DEIS) as the co-organizer.

The colloquium featured 32 research presentations covering various high voltage topics, including lightning, insulation and electrical discharges, transformers, electromagnetic compatibility, conductors, grounding systems, and other related fields. Around 70 participants attended the event, including members of the organizing committee.

Assoc. Prof. Dr. Lau delivering his keynote speech

One of the colloquium highlights was a keynote presentation by IVAT's research fellow, Assoc. Prof. Eur. Ing. Ir. Ts. Dr. Lau Kwan Yiew, who shared his research evolution titled "Embracing Sustainability through Advancements of Dielectric Materials." His presentation underscored the importance of sustainable practices in the development of dielectric materials, a critical area of high voltage research. The director of IVAT, Ts. Dr. Zulkarnain A. Noorden also participated in the colloquium, further strengthening networking among the high voltage experts. The colloquium concluded with a site visit to National Energy Centre (NEC) situated within UNITEN's campus.

Group photo

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

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Short Course on High Voltage Testing and Calibration Successfully Held

Group photo

JOHOR BAHRU, 25 September 2024 – IVAT successfully held a 2-day short course on High Voltage Testing and Calibration on 23 & 24 September 2024 at Pulai Springs Resort for theory session and at the Institute of High Voltage and High Current (IVAT) for hands-on session. The short course was facilitated by Assoc. Prof. Eur. Ing. Ir. Ts. Dr. Lau Kwan Yiew, Dr. Nur Aqilah Mohamad, Mr. Zamri Kassim and Mr. Hairoisyam Abd. Rani.

The short course mainly focused on the theory and hands-on involved in high voltage testing and calibration. On the first day, the participants were introduced to the Institute of Electrical and Electronics Engineers (IEEE) Standard 4, high voltage generation and measurement, measurement uncertainties, and high voltage testing for power cables, switchgears and transformers, led by Assoc. Prof. Eur. Ing. Ir. Ts. Dr. Lau Kwan Yiew. On the second day, the participants had the opportunity to perform hands-on sessions on high voltage testing and calibration measurement. IVAT sincerely thanks the participants for joining the short course.

IVAT hopes that the 2-day short course fulfilled the participants' needs and bring significant benefits to their workplace.

Dr. Nur Aqilah Mohamad, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

Engagement Session Between Resource Sustainability Research Alliance and IVAT

JOHOR BAHRU, 10 September 2024 – The engagement session between the Resource Sustainability Research Alliance (RSRA) and IVAT Centre of Excellence was successfully held on 09 September 2024, from 2:30 PM to 4:00 PM. The session was attended by Assoc. Prof. Ir. Dr. Dalila Mat Said (Chair of RSRA), Mrs. Norhaliza Hamzah (Research Officer of RSRA), Ms. Nadzlin Mohd Puat (Personal Assistant of RSRA), together with VAT staff.

The programme began with a welcoming address by the Director of IVAT, Ts. Dr. Zulkarnain Ahmad Noorden, who presented the IVAT 2023 achievements report, covering research activities, training programmes, and the IVAT Strategic Workshop. He also shared IVAT's plans and direction for 2024.

Photo during engagement session

A discussion session between IVAT staff and the RSRA Chair followed, during which Assoc. Prof. Dr. Dalila emphasised her aspiration for IVAT to further strengthen its achievements, particularly in research and consultancy.

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

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High Voltage Expertise from PETRONAS Shared with UTM Students


Group photo

JOHOR BAHRU, 30 May 2024 – In a significant knowledge-sharing session aimed at strengthening the bridge between academic learning and industrial application, Universiti Teknologi Malaysia (UTM) hosted a seminar titled "High Voltage Switchgear Inspection, Testing and Maintenance" at Lecture Hall 2 (DK2), L50 UTM Skudai. The session was delivered by Adjunct Associate Professor Mr. Noor Ekhsan Mohd Isnain, Principal (Distribution) from Group Technical Solutions, PD&T PETRONAS.

Organised by the Faculty of Electrical Engineering (FKE), the seminar was attended by students from the High Voltage course, researchers, and academic staff. Mr. Noor Ekhsan shared in-depth insights into the inspection procedures, testing methodologies, and maintenance best practices of high voltage switchgear equipment - an area critical to safe and reliable power system operations.

Following the seminar, a focused visit to IVAT took place on Wednesday morning (29 May 2024), immediately after a departmental meeting with the Head of Power Department. During the visit, Mr. Noor Ekhsan was given a tour of IVAT's high-end testing and calibration facilities. The session allowed for deeper discussion on technical collaboration opportunities, industry-aligned research, and student industrial training potential.

The two-day engagement reflects UTM's continued commitment to industry-academia partnerships and its proactive efforts to expose students to real-world challenges and solutions within the power and energy sector.

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

IVAT Participates in Industry Day

JOHOR BAHRU, 12 November 2024 – Universiti Teknologi Malaysia's Faculty of Electrical Engineering-Industry 2024 programme was held on Monday, 11 November 2024, from 8:30 A.M. to 5:00 P.M. at Block P19a, Faculty of Electrical Engineering, Universiti Teknologi Malaysia.


IVAT staff members at the booth

With the theme "Discover Your Path with Top Industries", the event provided students with valuable exposure to career opportunities, industry insights, and professional networking. Among the distinguished companies that participated were AMD, Medhini Group, Wiwynn Technology Service Malaysia, and several other leading industry players.

As part of the programme, IVAT set up a booth, joined by several lecturers and all assistant engineers. Their involvement gave students the opportunity to gain practical knowledge, explore research opportunities, and learn more about industry-related experiences in the field of electrical engineering.

The Faculty of Electrical Engineering-Industry 2024 had successfully inspired and guided students, preparing them for future success by connecting them with leading industry players and subject-matter experts .

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

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Short Course on High Voltage Generation and Measurement Successfully Held

Group photo

JOHOR BAHRU, 12 July 2024 – IVAT successfully conducted a two-day short course titled "Mastering High Voltage: Generation, Measurement, and Safety" on 10-11 July 2024. The course was designed to provide participants with a thorough and practical understanding of high voltage AC, DC, and impulse systems, equipping them with advanced technical skills and a deep appreciation of essential safety practices.

The course began with establishing strong theoretical foundations. Participants were introduced to the principles of high voltage engineering, with particular emphasis on advanced generation techniques for AC, DC, and impulse voltages. The session also explored precision measurement methods using industry-standard instruments, ensuring that attendees can confidently perform accurate and reliable assessments in real-world applications. Safety was also a central theme, with a dedicated segment on high-voltage safety protocols and precautionary measures. This component underscored the importance of protecting personnel, equipment, and facilities when working with high voltage systems.

The course also featured immersive, hands-on training at IVAT's well-equipped High Voltage Laboratory. Under the supervision of experienced instructors, participants operated specialised equipment, including the high voltage kit, to generate and measure AC, DC, and impulse voltages. These practical exercises were designed to consolidate the theoretical knowledge acquired during the course, enabling participants to apply concepts directly in a controlled laboratory environment. Emphasis was placed on accurate measurements, troubleshooting, and adherence to strict safety procedures, ensuring that participants developed both technical competence and operational confidence.


Practical session

At the end of the course, IVAT was hopeful that the attendees gained a comprehensive understanding of high voltage generation, measurement, and safety. They were able to implement advanced techniques in their respective fields, whether in industry, research, or academic settings. The course reflects IVAT's ongoing commitment to advancing expertise in high voltage engineering and reinforces its reputation as a leading centre for research, testing, and professional training in the region.

Dr. Norhafezaidi Mat Saman, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

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IVAT Participates in ICPADM 2024

Group photo at ICPADM 2024

PHUKET, THAILAND, 08 August 2024 – Assoc. Prof. Eur. Ing. Ir. Ts. Dr. Lau Kwan Yiew, research fellow of IVAT, made a distinguished contribution at the 14th International Conference on the Properties and Applications of Dielectric Materials (ICPADM) 2024. Held from August 4 to 7, 2024, and organised by King Mongkut's Institute of Technology Ladkrabang, the conference brought together leading experts in the field of dielectrics.

Assoc. Prof. Dr. Lau participated not only as a presenter but also served as one of the session chairs. Assoc. Prof. Dr. Lau was also awarded one of the Best Presenter Awards, recognised for his outstanding research presentation, underscoring his expertise in high voltage insulation and dielectric materials.

ICPADM 2024 featured two prominent keynote speeches. The Liu Ziyu Memorial Lecture Award was delivered by Prof. Toshikatsu Tanaka of the IPS Research Center, Waseda University, Japan, while Prof. Yao Zhou from Xi'an Jiaotong University, China, addressed attendees as the recipient of the IEEE DEIS Steven A. Boggs Young Professional Achievement Award.

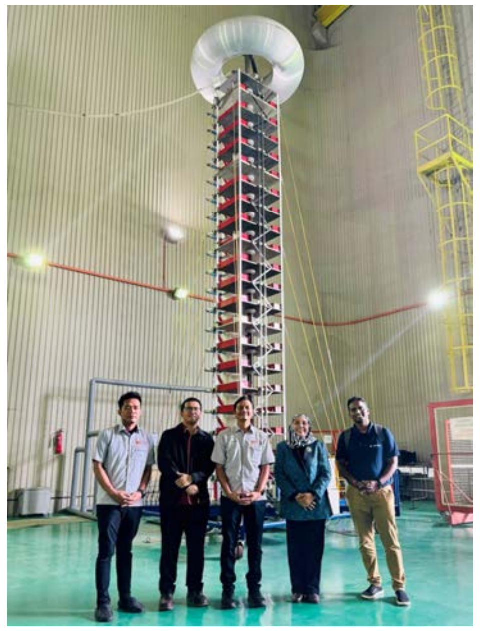
The conference provided a rich platform for discussions on critical topics, including high voltage condition monitoring, electrical insulation, dielectric phenomena, general dielectrics, advanced dielectrics, and applications in superconducting materials. Assoc. Prof. Dr. Lau's attendance highlighted IVAT's commitment to advancing research in these areas and engaging with the international dielectric materials community.

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

IVAT Engages with Potential Industry Collaborators

JOHOR BAHRU, 20 August 2024 – On August 19, 2024, IVAT successfully hosted an engagement session with potential industry collaborators from Haefely Switzerland and Orion Ventures Sdn. Bhd. The meeting was attended by Mr. Arunkumar Ragunathan, a representative of Haefely, a renowned Swiss company specialising in high voltage testing and measurement solutions, as well as Dato' Rozilah and her team from Orion Ventures Sdn. Bhd. Their visit provided a valuable opportunity to explore potential collaborative efforts aimed at driving excellence in high voltage research, testing, and industrial applications.

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



Group photo at IVAT

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IVAT Prihatin: Bersama Kita Kuat

JOHOR BAHRU, 28 Mac 2025 – Banjir yang melanda baru-baru ini telah meninggalkan kesan yang mendalam kepada ramai keluarga, termasuk salah seorang warga IVAT, En. Mohd Azrul bin Othman. Dalam sekelip mata, kediaman beliau sekeluarga terjejas, harta benda rosak, dan kehidupan seharian berubah. Bagi kita yang melihat dari jauh, mungkin sukar membayangkan kepayahan itu tetapi bagi mereka yang melaluinya, setiap hari adalah perjuangan untuk bangkit semula.

Melihat situasi ini, warga IVAT tidak berdiam diri. Dengan rasa empati dan keikhlasan, satu inisiatif sumbangan telah digerakkan untuk membantu meringankan beban En. Mohd Azrul. Hasil daripada sokongan semua, sumbangan telah berjaya disalurkan, membawa sedikit sinar harapan kepada beliau dan keluarga. Walaupun bantuan ini mungkin tidak dapat menghapuskan semua kesusahan, ia menjadi tanda bahawa beliau tidak menghadapi dugaan ini sendirian.

Setiap ringgit, setiap kata semangat, dan setiap doa yang dihulurkan adalah bukti bahawa keluarga IVAT sentiasa bersatu hati. Di sebalik angka dan jumlah sumbangan, tersimpan nilai kemanusiaan yang tiada tolok bandingnya. Nilai yang menjadikan kita bukan sekadar rakan sekerja, tetapi sebuah komuniti yang saling menguatkan.

En. Mohd Azrul (kiri) bersama Pengarat IVAT Ts. Dr. Zulkarnain Ahmad Noorden

Pihak IVAT ingin merakamkan setinggi-tinggi penghargaan kepada semua yang telah menyumbang, baik secara langsung mahupun tidak langsung. Keprihatinan anda bukan sahaja meringankan beban keluarga yang ditimpa musibah, tetapi juga menjadi inspirasi bahawa kebaikan sentiasa wujud walaupun dalam saat yang paling sukar.

Semoga usaha ini menjadi pembakar semangat untuk kita semua terus mengekalkan budaya saling membantu, kerana di saat ujian datang, tangan yang menghulur bantuan adalah sinar yang menyalakan harapan. Bersama, kita kuat .

Mr. Abdul Syafiq Abdullah Shuhaimi, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

Other Happenings

IVAT Colloquium, 17 February 2025

Pengauditan Anugerah Keselamatan dan Kesihatan Pekerjaan 2024, 13 May 2025,

Usaha Kelestarian Gaya Hidup Sihat, 26 April 2025

Majlis Tautan Ukhwah Syawal 1446H, 10 April 2025

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Other Happenings


IVAT Management Review Meeting (Testing Laboratory), 26 February 2025


IVAT Strategic Planning Workshop, 12 February 2025

Successful Grant Application, 15 November 2024


IVAT Family Day, 12 February 2025

Successful Grant Application, 01 September 2024

IVAT Appreciation Ceremony, 27 November 2024

Successful Grant Application, 01 August 2024

Dr. Mohd Hafizi Ahmad Promoted to Associate Professor, 08 July 2024


IVAT Colloquium, 17 July 2024

Engagement with University Laboratory Management Centre, 02 July 2024


Engagement with Bursary Office, 22 July 2024

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Welcome to IVAT

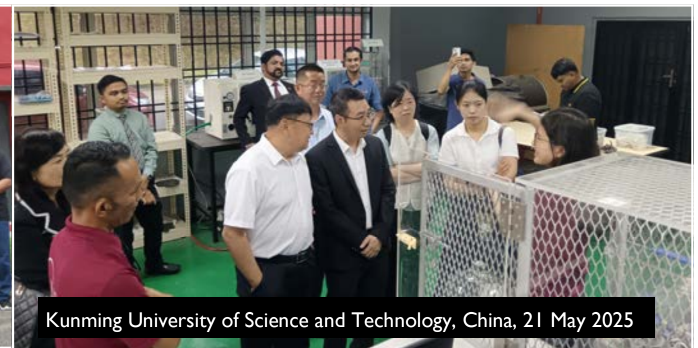
IVAT, Universiti Teknologi Malaysia (UTM), is committed to entertain visits by delegates from not only its own university, but also as far as overseas. The main aim for IVAT organising visits is to share their research, services and consultancy experience to as many people as they could, especially in 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.


Singapore Polytechnic, 10 June 2025


Kunming University of Science and Technology, China, 21 May 2025


Tashkent State Technical University, Uzbekistan, 10 June 2025


TNB Research & TNB Distribution Network Division, 26 March 2025


Universitas Brawijaya, Indonesia, 23 September 2024


ETD Makmur, 12 September 2024


Politeknik Tun Syed Nasir Syed Ismail , 11 September 2024


Institut Teknologi Bandung (ITB), Indonesia, 09 September 2024

IVAT Fosters Collaborations Via Technical Visit

NEGERI SEMBILAN, 27 August 2024 – On 26 August 2024, delegates from IVAT conducted a technical visit to EPE Switchgear (M) Sdn. Bhd., High Voltage Test Lab Sdn. Bhd. (HVTL), and Universiti Putra Malaysia (UPM). The visit aimed to explore advanced facilities, foster collaboration, and discuss future opportunities in high voltage engineering.

At EPE Switchgear, the team was welcomed by Ir. Nazary Ahmad and toured the production line, gaining valuable insights into switchgear manufacturing processes. At HVTL, Dr. Syahmi Abd Rahman presented the lab's high voltage testing services, followed by a tour of its facilities. The afternoon session at UPM, liaised by Assoc. Prof. Ir. Dr. Norhafiz Azis focused on potential collaborations in teaching, research and service activities with both parties expressing strong interest in advancing technology and strengthening industry-academia partnerships.

The visit provided IVAT with deeper understanding of industry capabilities and academic expertise in high voltage engineering.

Dr. Nur Aqilah Mohamad, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.

Group photo with Ir. Nazary (sixth from left) at EPE Switchgear

Group photo with Dr. Syahmi (sixth from right) at HVTL

Group photo with Assoc. Prof. Ir. Dr. Norhafiz (5th from right) at UPM

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. Since 2013, IVAT has been accredited with the on-site calibration and the scope of calibration has been extended up to 180 kV AC (alternating current), 180 kV DC (direct current) and 140 kV impulse. Beginning 2015, IVAT has been accredited with power cable AC voltage withstand test. Recently in 2020, IVAT has successfully migrated to the latest MS ISO/IEC 17025:2017 standard.