

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).

INSIDE THIS ISSUE

Page 2

IVAT Director's remarks

Page 3

Training with Behr Bircher Cellpack Malaysia

Page 5

Visit from Perusahaan Listrik Negara and Institut Teknologi Bandung

Page 7

IVAT Strengthens Collaboration

Page 12

Mini Symposium for High Voltage Technology

Page 13

Benchmarking Visit from University College of Technology Sarawak

Page 16

IVAT welcomes visitors

Short Course on High Voltage Engineering Successfully Organised



Discussion during Short Course on High Voltage Engineering.

JOHOR BAHRU, 07 March 2018 – The Institute of High Voltage and High Current (IVAT) successfully organised the Short Course on High Voltage Engineering for the participants from the University College of Technology Sarawak (UCTS) from 25 February to 1 March 2018. Through the short course, the participants were exposed to the concept and theory

of gaseous, liquid and solid insulation breakdown. The participants also learned the key principles of high voltage technology as well as insulation testing, including the generation and measurement of high voltage, with appropriate safety considerations. The participants also had hands-on experience to construct and conduct (continued on page 2...)

High Voltage Research Talk Successfully Held



Prof. Dr. Zulkurnain delivering his talk.

JOHOR BAHRU, 26 April 2018 – The Faculty of Electrical Engineering (FKE), Universiti Teknologi Malaysia (UTM), in collaboration with the IEEE Dielectrics and Electrical Insulation Society (DEIS) Malaysia Chapter, IEEE Power and Energy Society (PES) Malaysia Chapter and IEEE UTM Student Branch, successfully organised a talk on High Voltage Research on 24 April 2018 at FKE, UTM Johor Bahru. Around 150 undergraduate students undertaking the High Voltage Technology and Final Year Project courses attended the talk delivered by Prof. Dr. Zulkurnain Abdul Malek,

(continued on page 10...)

IVAT Director's Remarks



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

It feels good to meet again in my usual column of IVAT's Newsletter. Since the last issue, IVAT has been actively involved in services (test and calibration), consultancy and training activities, apart from day-to-day teaching and learning as well as research work. For the past one year, IVAT has proudly achieved the followings:

- Carried out restructuring of IVAT with the introduction of a Deputy Director of Service, Consultancy and Training (SCT) and a Deputy Director of Research, Networking and Commercialisation (RNC). An office renovation project to properly accommodate two newly appointed Quality Managers and one Research Division Head had also been completed
 - Appointed a Product Development Engineer to assist IVAT in developing prototypes, obtaining intellectual property rights, and commercialising research products
 - Synergised with Kelab Kebajikan Staf IVAT to organize several successful functions involving active participations of IVAT staff and postgraduate students
 - Won a total of 9 awards during the Faculty of Electrical Engineering's 2018 Staff Excellence Award Ceremony
- To IVAT's staff, may this year be another successful year for IVAT in all areas. To our customers, I would like to thank you for your continuous supports and we are very eager to serve you better in the future.
- Played an active role in Malaysian High Voltage Network (MyHVnet) and IEEE Dielectrics and Electrical Insulation Society (DEIS) Malaysia Chapter with co-organization of several activities including the distinguished lecturer programme and various technical talks
 - Successfully prepared the documentations and is ready for MS ISO/IEC 17025:2017 migration for both its calibration and test laboratories
 - Performed excellently in Malaysia Research Assessment (MyRA) Audit for 2017 and successfully submitted its application for Higher Institution Centre of Excellence (HICoE) status

(... continued from page 1)

experiments relevant to high voltage engineering. In addition, the participants also had the opportunity to have a complete tour of the laboratory and equipment at IVAT and understand the daily operational needs of the high voltage laboratory at IVAT. A fruitful discussion session on potential collaborations between IVAT and UCTS was also carried out, where IVAT and UCTS are expected to strengthen their tie on high voltage related matters in the future. The facilitators of the short course, Assoc. Prof. Dr. Mohamed Afendi Mohamed Piah, Dr. Noor Azlinda Ahmad and Ir. Dr. Lau Kwan Yiew, wish to thank the participants for their keen interest and ac-



Laboratory hands-on session.

tive participation during the short course. IVAT sincerely hopes that the five-day short course equips the participants with the appropriate knowledge on high voltage engineering and helps the participants on future matters relevant to high voltage engineering.

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

Editorial Board

Advisor:

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Editor & Designer:

Ir. Dr. Lau Kwan Yiew

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Training on Plug-in Separable Cable Joint with Behr Bircher Cellpack Malaysia

JOHOR BAHRU, 9 November 2017 – IVAT continued to work closely with the industry through the training series with Behr Bircher Cellpack Malaysia Sdn. Bhd. (BBCMY). This time, 3 academic members and 2 assistant engineers of IVAT learned from BBCMY a different module of training, namely, "Research and Testing Collaborations on Plug-in Termination for Polymeric Cables up to 24 kV". The training started at 9:00 am on the 1st of November 2017, welcomed by the BBCMY's Managing Director, Mr. Hanspeter Ritzmann, and facilitated by two experienced engineers from the company, Mr. Sapto Endar Djuniarso (Technical Engineer) and Mr. Dody Ismoyo (Application Technology Engineer).

The training project consisted of 5 modules. The theoretical part included the following modules: (i) Introduction to Cellpack products, (ii) Single core cable construction, and (iii) Cellplux plug-in product introduction. Meanwhile, the practical part consisted another 2 modules: (i) Plug-in installation steps using T-form separable connector for single core polymeric cables up to 24 kV as well as termination points, and (ii) Laboratory testing. Four of the modules were conducted as a 1-day training and hands-on sessions at the BBCMY factory in Gelang Patah, Johor, while the other module will be carried out as a 2-day laboratory testing work at IVAT in coming weeks.

During the 1-day training session, the participants were theoretically and practically exposed to the construction, component selection, and installation steps for the joint point using T-Form separable connector especially for switchgear termination point. All the processes were demonstrated in detail by both the facilitators. The training session concluded at 5:30 pm with a brief speech by BBC Managing Director, Mr. Ritzmann and some fruitful discussion between the two parties.

IVAT sincerely thanks BBCMY for providing such a meaningful platform to bridge the knowledge gap between academia and industry. IVAT is glad that all the attended staff gained valuable knowledge during the training and hopes for more strategic collaborations between IVAT and BBCMY in the future..

Dr. Mona Riza Mohd Esa, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.



Photos during training.

IVAT's Staff Won Several Awards

JOHOR BAHRU, 13 May 2018 - IVAT's staff won a total of nine awards at the Faculty of Electrical Engineering's 2018 Staff Excellence Award Ceremony, which was held at Universiti Teknologi Malaysia's Alumni Hall. The event was organised by the faculty to recognise its staff for their excellent contributions in the year 2017.

There were a total of 17 award's categories that had been presented to the winners among both academic and non-academic staff. IVAT's Director won 3 awards, i.e., Best Consultation Award, Best Indexed Journal (ISI and Scopus) Award and Best Research Award. The Best Research Grant (International) Award was won by Assoc. Prof. Dr. Zolkafle Buntat and Dr. Mohd Hafizi Ahmad. Assoc. Prof. Dr. Mohamaed Afendi Mohamed Piah, Dr. Zulkarnain and Mr. Azrul won the Excellent Service Award while the Special Award for Performance Improvement for the POWER department was won by Dr. Zuraimy Adzis.

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



Certificates and plaques won by IVAT's staff.

IVAT Welcomes Visiting Researcher (Publication), Visiting Lecturer and Product Development Engineer

JOHOR BAHRU, 15 May 2018 – IVAT welcomes Dr. Amirreza Naderipour, who has just completed his PhD at the Department of Electrical Power Engineering (POWER), Faculty of Electrical Engineering (FKE), Universiti Teknologi Malaysia (UTM), as a Visiting Researcher (Publication) at IVAT from 1 February 2018 – 31 July 2018. Dr Amirreza is currently under Prof. Dr. Zulkurnain Abdul Malek’s supervision but all staff are encouraged to work closely with Dr. Amirreza on publication related matters. His office is at P06-215. IVAT also welcomes back Dr. Muhammad Abu Bakar Sidik from Universitas Sriwijaya (UNSRI) as a Visiting Lecturer for another year from 1 March 2018 – 28 February 2019. Dr. Abu Bakar will regularly visit IVAT for collaborative work between IVAT and UNSRI. In addition, IVAT also welcomes Mr. Shah Ridzwan Sahrom as a Product Development Engineer to assist IVAT in developing prototypes, obtaining intellectual property rights, and commercialising research products.



Dr. Amirreza



Dr. Abu Bakar

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

Room and Equipment Rental at IVAT

IVAT offers the following rooms and equipment for rental. For other facilities/services or more details, please e-mail us: ivat@fke.utm.my



IVAT's Seminar Room can accommodate up to 30 persons (with tables) or 100 persons (without tables). The daily rental rate is RM 350.00 (standard rate), RM 227.50 (for UTM's staff) or RM 175.00 (for UTM's students)



IVAT's Meeting Room can accommodate up to 15 persons. The daily rental rate is RM 300.00 (standard rate), RM 276.00 (for UTM's staff) or RM 246.00 (for UTM's students)

INSTITUTE OF HIGH VOLTAGE AND HIGH CURRENT (IVAT)	
TENTATIVE PRICES FOR EQUIPMENT RENTAL*	
FOR RESEARCH STUDENTS / INDUSTRIES / OTHER INSTITUTIONS	
ITEM	PRICE
IMPULSE MEASURING SYSTEM	RM 250/DAY
HVAC MEASURING SYSTEM	RM 300/DAY
HVDC MEASURING SYSTEM	RM 300/DAY
CLIMATIC CHAMBER	RM 300/DAY
SOIL RESISTIVITY MEASUREMENT	RM 200/DAY
SOIL RESISTANCE MEASUREMENT	RM 100/DAY
PEARSON CURRENT MONITOR	RM 100/DAY
IMPULSE GENERATOR	RM 500/DAY
IR CAMERA SYSTEM	RM 200/DAY
HIGH VOLTAGE LABORATORY	
For development test only	RM 8000/DAY
For research student from other institutions	RM 1000/DAY

*Terms and conditions apply. Subject to the approval from IVAT's Director.
For other facilities/services or more details, please e-mail us: ivat@fke.utm.my

Congratulations to IVAT's Staff



Prof. Dr. Zolkafle Buntat Ir. Dr. Lau Kwan Yiew

JOHOR BAHRU, 31 May 2018 – IVAT wishes to congratulate Dr. Zolkafle Buntat for being promoted to the position of Professor at Universiti Teknologi Malaysia. IVAT also wishes to congratulate Ir. Dr. Lau Kwan Yiew for being re-appointed as the Chairman of the IEEE Dielectrics and Electrical Insulation Society (DEIS) Malaysia Chapter in 2018 (more information about the IEEE DEIS Malaysia Chapter can be found on <http://deis.ieeemy.org/>). IVAT wishes Prof. Dr. Zolkafle and Ir. Dr. Lau all the best and is looking forward to their continued contributions especially in the field of high voltage engineering.

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

Visit from Perusahaan Listrik Negara and Institut Teknologi Bandung

JOHOR BAHRU, 30 March 2018 – In conjunction with the Workshop on Future Research in Energy Management conducted at Universiti Teknologi Malaysia (UTM), delegates from PT Perusahaan Listrik Negara (PLN), and Institut Teknologi Bandung (ITB), Indonesia, visited the Institute of High Voltage and High Current (IVAT), Faculty of Electrical Engineering (FKE), UTM, on 6 March 2018. The delegates were welcomed by the Director of IVAT, Prof. Dr. Zulkurnain Abdul Malek. During the visit, the delegates



Laboratory tour.



Laboratory tour.

were introduced about IVAT – a centre of excellence at UTM that carries out research, services and consultancies in high voltage engineering. The delegates also visited the laboratory of IVAT and were exposed to various facilities at IVAT. Many potential collaborations among PT PLN, ITB and IVAT were also discussed during the visit. The Director of IVAT wishes to thank PT PLN and ITB for their visit to IVAT and hopes the visit opens the door of collaborations among PT PLN, ITB and IVAT.

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



Group photo.

IVAT's Staff Successfully Passed SEDA-OGPV Competency Design Course

JOHOR BAHRU, 26 February 2018 – Dr. Zulkarnain Ahmad Noorden successfully passed the off-grid photovoltaic (OGPV) competency design course organised by Sustainable Energy Development Authority (SEDA) Malaysia. The 10-day design course, which was held at Green Energy Research Centre, Universiti Teknologi MARA, Shah Alam, from 15 to 26 January 2018, is one of the renewable energy related competency courses organised by SEDA for system designers, chargemen and wiremen.

With the review of basic electricity and solar engineering at the beginning, the course comprehensively covered on OGPV system design such as its principles, components selection and sizing, installation, testing, commissioning and acceptance test. The course ended with theoretical and practical competency examination sessions. To be successfully awarded as a competent

OGPV system designer, participants were compulsorily required to pass both examinations.

The design course was partially sponsored by IVAT as its continual practices of encouraging its staff to attend such career-related courses. IVAT wishes Dr. Zulkarnain all the best and hopes he would contribute more on renewable energy related activity to the institute as well as the community.

More information about the SEDA courses can be found at <http://www.seda.gov.my>.

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



Dr. Zulkarnain (leftmost) with the participants during the practical OGPV session of testing and commissioning.



Group photo with the Director of Renewable Energy Technology of SEDA, Mrs. Azah Ahmad (seventh from left) and the trainers during the design course.

IVAT Strengthens Collaboration with UNSRI Through Research MOA

JOHOR BAHRU, 7 February 2018 – The relationship between Universiti Teknologi Malaysia (UTM) and Universitas Sriwijaya (UNSRI) started since the last two decades leading to an MOU signed on 10 August 2011. The aim of the MoU was to promote research collaboration and staff exchange between both universities. Among collaboration activities that has been carried out was the invitation of UTM's staff by UNSRI to deliver invited speeches at departments and faculties in UNSRI.

To further strengthen the relationship between UTM and UNSRI, a more specific collaborative effort through a MOA was recently initiated through Institut Voltan dan Arus (IVAT), UTM and Laboratorium Teknik Tegangan Tinggi dan Pengukuran Listrik (LTTPL), UNSRI on 7 February 2018. The main aim of the MOA is to enhance the professional relationship through research collaboration. A total of RM114,252.00 funding has been awarded by UNSRI to 6 researchers from IVAT through the MOA.

The MOA signing ceremony, which held at Main Meeting Room, UTM Johor Bahru, was represented by UNSRI's Rector, Prof. Dr. Ir. Anis Saggaff and Vice Chancellor of UTM, Prof. Datuk Ir. Dr. Wahid Omar. The Rector Representative I (Academic) of UNSRI, Prof. Ir. Zainuddin Nawawi and the Dean of the Faculty of Electrical Engineering, UTM were also attended the ceremony as the witnesses.

The idea of signing the MOA between IVAT and LTTPL started as a result of the discussion between researchers from both parties to collaborate in the field of lightning and its protection, high voltage insulation and ozone based technology. Both parties hope that the collaboration will enhance research activities and collaborative supervision for Masters and PhD programs as well as other related areas between both parties.

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



Photos taken during the MOA signing ceremony

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)

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

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

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



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

Contact details :

Dr. Zulkurnain Abdul Malek
Professor / Director
E-mail: zulkurnain@utm.my

Dr. Zolkafle Buntat
Professor / Deputy Director
(Research, Networking and Commercialisation)
E-mail: zolkafle@utm.my

Dr. Noor Azlinda Ahmad
Senior Lecturer / Deputy Director
(Service, Consultancy and Training)
E-mail: noorazlinda@utm.my

Dr. Zuraimy Adzis
Senior Lecturer / Head of Division
(Lightning Research and Safety)
E-mail: zuraimy@utm.my

Dr. Mona Riza Mohd Esa
Senior Lecturer / Laboratory Head
E-mail: monariza@utm.my

Dr. Mohamed Afendi Mohamed Piah
Associate Professor / Head of Department
(Electrical Power Engineering)
E-mail: fendi@utm.my

Ir. Dr. Lau Kwan Yiew
Senior Lecturer / Quality Manager
(Calibration)
E-mail: kwanyiew@utm.my

Dr. Zulkarnain Ahmad Noorden
Senior Lecturer / Quality Manager
(Testing)
E-mail: zulkarnain-an@utm.my

Dr. Mohd Hafizi Ahmad
Senior Lecturer / Head of Division
(Dielectrics, Diagnostics and Discharges)
E-mail: mohdhafizi@utm.my

Office Phone:
+607 553 5615

Official Website:
ivat.utm.my

Address:

Institute of High Voltage and High Current, Block P06, Faculty of Electrical Engineering,
Universiti Teknologi Malaysia, 81310 Johor Bahru, Malaysia.

(... continued from page 1)

the Director of the Institute of High Voltage and High Current (IVAT), UTM. Various interesting research topics and findings on high voltage engineering, including lightning phenomena and dielectric materials, were delivered by Prof. Dr. Zulkurnain during the talk. Prof. Dr. Zulkurnain also shared with the students the high voltage research activities carried out at IVAT, and potential research areas that ones can ventured into for research purposes. Through the seminar, it is hoped that the undergraduate students are aware of the latest research and networking relevant to high voltage engineering



Prof. Dr. Zulkurnain with the audience.

apart from obtaining their knowledge through classroom lectures and textbooks. This would allow the students to enhance learning through research information, in line with UTM's effort to enrich the nexus between research, learning and teaching. The seminar coordinators, Dr. Noor Azlinda Ahmad and Ir. Dr. Lau Kwan Yiew, sincerely thank Prof. Dr. Zulkurnain for voluntarily delivering the talk to the undergraduate students.

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

Electrical@UTM

"The excellent pathway to secure a bright future"



The Bachelor of Engineering (Electrical) programme, codenamed SKEE, is one of the undergraduate programmes offered by the Department of Electrical Power Engineering (POWER), Faculty of Electrical Engineering, Universiti Teknologi Malaysia, to prepare graduates for positions as electrical engineers. The SKEE programme has been designed to emphasise not only on the understanding and acquisition of basic principles and skills in the field of electrical engineering, but also on a wide range of subareas including electronics, control systems, instrumentation, signal processing, telecommunications and power systems. The department also offers the Master of Engineering (Electrical Power) programme, codenamed MKEP, for those interested to pursue a postgraduate degree (by taught course). For more information, please visit POWER's webpage at <http://www.fke.utm.my/power/> [Picture courtesy of the Department of Electrical Power Engineering, Universiti Teknologi Malaysia]

Pursue Your Postgraduate Studies at UTM IVAT

The Institute of High Voltage and High Current (IVAT), Universiti Teknologi Malaysia (UTM), welcomes applications for Doctor of Philosophy (PhD) and Master of Philosophy (MPhil) studies to undertake research projects at IVAT. The themes of the projects include:

- Lightning characterisation, monitoring and detection
- Electromagnetic compatibility and interference
- Partial discharge detection and measurements
- Plasma and ozone generation applications
- Supercapacitors in high voltage applications
- Dielectrics and electrical insulating materials

Admission Requirements:

- **PhD:**
Entry to the programme requires a Master degree in Electrical Engineering or equivalent from UTM or other Institution of Higher Learning recognised by UTM. First-class Bachelor graduates (CGPA \geq 3.67/4.00) may apply for a fast-track PhD (terms & conditions apply)
- **MPhil:**
Entry to the programme requires a Bachelor degree in Electrical Engineering or equivalent from a tertiary institution recognised by UTM, with a minimum CGPA of 3.00/4.00 for fresh graduates, or a minimum of 2.50/4.00 with four (4) years experience as an Electrical Engineering practitioner
- **English Requirement for International Students:**
All international students must have a valid two-year old TOEFL or IELTS certificate with a TOEFL score of 550 (or 79 IBT) or an IELTS Band 6

Why Study at IVAT?

- Our field of electrical and electronic engineering is ranked Top 100 in the world (according to QS World Ranking by Faculty 2017)
- Our high voltage laboratory is the largest in Malaysia
- We have well-equipped high voltage facilities
- We have widely experienced supervisors working on a variety of high voltage related research and development
- We have dedicated student working areas for office and laboratory work

To Apply:

- Please send your resume with academic qualifications, transcripts and research proposal to the Director of IVAT, Prof. Dr. Zulkurnain Abdul Malek at zulkurnain@utm.my anytime throughout the year. You may also directly contact the respective project supervisors at IVAT.

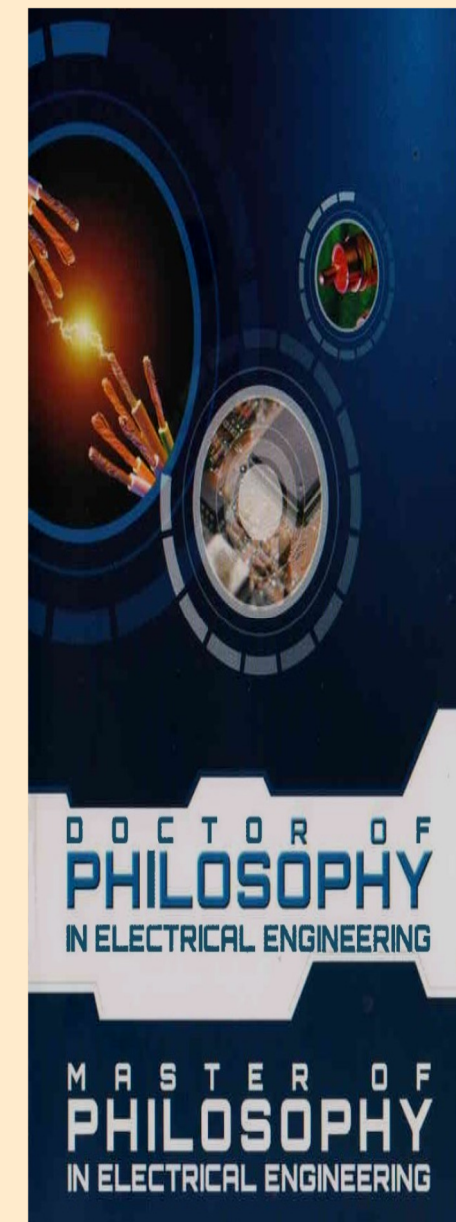
For more information about IVAT, please visit: <http://ivat.utm.my/>

For more information about UTM's postgraduate programmes, please visit: <http://admission.utm.my/>



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Institute of High Voltage and High Current
IVAT



Mini Symposium for High Voltage Technology

JOHOR BAHRU, 28 May 2018 – A mini symposium for the third year students of SKEE4463 High Voltage Technology was held at the Institute of High Voltage and High Current's (IVAT), Faculty of Electrical Engineering, Universiti Teknologi Malaysia, on 27 May 2018. The seminar was arranged for the students to present the outcome of their research-based assignment which covered several topics learned from the subject of High Voltage Technology, such as insulation coordination, lightning, breakdown theory and generation of high current and high voltage impulse. It was also done to fulfil the requirement of the Teaching-Research Nexus element as stated in the course outline of SKEE4463. About 150 students in groups of 3-5 students was given 8 minutes for the poster presentation and they were evaluated by the academic panels from IVAT. Overall, the mini symposium was successfully carried out and IVAT hopes that the students gained useful experience from their assignments and the mini symposium.

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



Various scenes during mini symposium.



IEEE DEIS Sponsored Event and Other High Voltage News

JOHOR BAHRU, 01 May 2018 – A distinguished lecturer programme sponsored by the IEEE Dielectrics and Electrical Insulation Society (DEIS) was successfully conducted by Professor Toshikatsu Tanaka of Waseda University, Japan, at IVAT, on 07 November 2017. News of the programme can be found in IEEE Electrical Insulation Magazine via the following links:

<https://ieeexplore.ieee.org/document/8300446/>
<https://ieeexplore.ieee.org/document/8300447/>

Meanwhile, a lot of other high voltage related news can be found in Issue 3 of MyHVnet Newsletter (published in January 2018) that can be accessed via the following link:

<http://ivat.utm.my/myhvnet/news/>



Professor Tanaka at IVAT.



MyHVnet Newsletter.

IVAT's Laboratory Induction Session

JOHOR BAHRU, 25 October 2017 – On 24 October 2017, the Institute of High Voltage and High Current (IVAT) organised a laboratory induction session for its undergraduate and postgraduate students needing access to the high voltage laboratory.

In line with UTM's aspiration to have a safe and healthy workspace for its students, the 2-hour induction session intended to raise the awareness of the students on safety, health and environmental issues when carrying out their works in the high voltage laboratory. These include the need to obtain the necessary permission prior to accessing the laboratory, take appropriate measures to prevent hazards in the laboratory, use appropriate personal protective equipment for different tasks, and understand emergency response procedures.

Through the induction session, the Director of IVAT, Professor Dr. Zulkurnain Abdul Malek, hopes that issues related to safety and health in the laboratory can be appropriately addressed to and practised by the students.



IVAT's Assistant Engineer, Mr. Zamri, explaining on the health and safety procedures.

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

Benchmarking Visit from University College of Technology Sarawak

JOHOR BAHRU, 14 August 2017 – The Department of Electrical Power Engineering and the Institute of High Voltage and High Current of the Faculty of Electrical Engineering, Universiti Teknologi Malaysia (UTM), received a benchmarking visit from the staff and students of the School of Engineering and Technology, University College of Technology Sarawak (UCTS). The visitors, led by Assoc. Prof. Ir. Dr. Abdul Razak Yaacob (Head of Undergraduate Programme at UCTS), wished to understand more about the undergraduate programmes offered by FKE, in particular, the Bachelor of Engineering (Electrical) programme, so that the well-established undergraduate programme at UTM could serve as a benchmark for UCTS' recently established Bachelor of Electrical Engineering programme.

During the visit, the delegate from UCTS were informed of how the Bachelor of Engineering (Electrical) programme at UTM was run to fulfill the criteria set out by the Engineering Accreditation Council (EAC), Malaysia. They were also briefed on recent changes to the programme to adopt the con-

cept of Industry 4.0 in addressing the latest industrial needs. They also had a chance to visit the High Voltage Laboratory at UTM to understand the operation of the laboratory in fulfilling students' classroom and project needs in addition to research and development activities relevant to high voltage. Meanwhile, the delegate from UCTS briefed on their university's aspiration and undergraduate programmes and looks forward to establish close ties with UTM in future academic-related matters.

Lots of information exchange relevant to academic matters took place during the visit. The Head of the Department of Electrical Power Engineering, UTM, Assoc. Prof. Dr. Mohamed Afendi Mohamed Piah, wishes to extend his gratitude to the delegate from UCTS and the staff from UTM for the fruitful visit.

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



Group photo.

IVAT's Final Year Project Student Won Several Awards in Electrical Engineering Student Symposium 2018

JOHOR BAHRU, 31 May 2018 – The closing ceremony of Electrical Engineering Student Symposium (EESS) 2018 was conducted at P19a-BKT6, Faculty of Electrical Engineering, Universiti Teknologi Malaysia, on 27th May 2018. There were several category awards contested in EESS 2018, which involved students from different fields of electrical engineering, including High Voltage. One of the Final Year Project's students from the Institute of High Voltage and High Current, namely, Norhafezaidi Mat Saman, supervised by Prof. Dr. Zolkafle Buntat won four awards, which consisted of Consolation for Best Paper Award, Best Project Award for High Voltage Track, Excellence Award and Best of the Best Project Award.

The title of final year project was "Performance Study of Non-Thermal Plasma Chamber to Remove NOx from Diesel Engine Vehicle". One of the main sources of pollutants is the release of nitrogen oxide (NOx) from diesel engine vehicle. Non-thermal plasma (NTP) treatment is a process of removing the NOx release from the incomplete combustion of diesel engines. The concept of high voltage used to generate non-thermal plasma in the project was dielectric barrier discharge (DBD). A non-thermal plasma chamber is an exhaust chamber that has the capability to remove the emission of NOx spe-

cies. The non-thermal plasma chamber provides oxidation treatment process inside the chamber, known as the non-thermal plasma treatment. The NOx species experiences oxidation process, and then converted to produce nitrogen dioxide (NO2). In the project, a simulation study of the geometric properties of the exhaust chamber was conducted in order to obtain the most effective NTP chamber that could help the process of NOx removal to become more efficient. NTP chamber was then fabricate based on the result obtained from the simulation in order to verify the result based on the actual experiment setup of NTP treatment. The non-thermal plasma generator was develop by using high intensity discharge (HID) ballast with 23 kV AC striking voltage. The effectiveness of NOx removal was determined by taking in count the percentage reduction of NOx.

IVAT congratulates Norhafezaidi on his excellent achievement through his Final Year Project and wishes him the best in his future undertakings.

Prof. Dr. Zolkafle Buntat, Institute of High Voltage and High Current, Universiti Teknologi Malaysia.



Prof. Dr. Zolkafle with Norhafezaidi (right)

IVAT's Researcher Invited to Product Showcase during the 2018 Mandate Ceremony of the Ministry of Education

JOHOR BAHRU, 13 January 2018 – In conjunction with the 2018 Mandate Ceremony by the Minister of Education, Dato' Seri Haji Idris Jusoh, Universiti Teknologi Malaysia's Innovation and Commercialisation Centre (UTM ICC) invited IVAT's researcher, Dr. Zulkarnain Ahmad Noorden and his colleague, Dr. Jasrul Jamani Jamian to showcase their recently completed project and product, namely "Eco-Balai Rawatan in Kampung Orang Asli Pucur (100% Solar-Powered)" and "PVedukit", respectively. The ceremony was held at the Putrajaya International Convention Centre (PICC), Putrajaya, on 11th January 2018. Dr. Zulkarnain and Dr. Jasrul involved in the 1-day showcase, promoting the institute, faculty, project and research. They also took the opportunity to strengthen UTM's network with other universities since the showcase event also involved many other public and private universities. They also had the chance to personally meet and share their recent project to the Deputy Minister of Education, YB Datuk Dr. Mary Yap Kain Ching, during her visit to UTM's booth.

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



Dr. Zulkarnain presenting his community project's outcome, a module entitled "Garis Panduan Mudah Penyelenggaraan Sistem Tenaga Elektrik Solar Terasing", to YB Datuk Dr. Mary Yap Kain Ching during her visit to the booth.



UTM representatives with the UTM's Pro Chancellor, YBhg. Tan Sri Datin Paduka Siti Sadiyah Sheikh Bakir (fifth from left).

Welcome to IVAT

The Institute of High Voltage and High Current (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 sus-

tainable 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 visits to IVAT.



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Published by:

**Institute of High Voltage and High Current
(IVAT)**

Block P06

Universiti Teknologi Malaysia
81310 Johor Bahru, Johor
Malaysia

Phone: +60 7 553 5615

Fax: +60 7 557 8150

E-mail: zulkurnain@utm.my

Website: ivat.utm.my

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.