

MyHVnet

Newsletter

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MyHVnet

is the abbreviated name for Malaysian High Voltage Network – a networking group for high voltage engineering in Malaysia.

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2023 MyHVnet AGM

KAJANG 16 January 2023 – The 2023 Annual General Meeting (AGM) of Malaysian High Voltage Network (MyHVnet) was held on January 16, 2023 at TNB Research (TNBR) Sdn. Bhd. in Kajang, Selangor. The meeting was attended by about 50 members of MyHVnet from various institutions, government and private sectors alike. The meeting

was held in a hybrid mode, whereby most of the attendees were able to attend face to face, and some of them attended remotely (online).

At 9.00 am, all attendees arrived at TNBR, and breakfast was served. At 9.15 am, the 2023 MyHVnet AGM started, chaired by

(continued on page 5...)



Group photo during 2023 MyHVnet's AGM.

Technical Visit to TNB Research

KAJANG, 16 January 2023 - Malaysian High Voltage Network (MyHVnet) in collaboration with the IEEE Dielectrics and Electrical Insulation Society (DEIS) Malaysia Chapter and TNB Research Sdn. Bhd. successfully organised a technical visit to several laboratories at TNB Research on 16 January 2023. The visit was attended by 30 participants from local universities and industries with backgrounds in high voltage engineering. The main objective of the visit was to showcase current research projects and facilities available at laboratories at TNB



TNBR's representative (right) explaining about the facility.

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MyHVnet 2023-2024 Chairman's Remarks



Ir. Ts. Dr. Mohd Aizam Talib,
TNB Research Sdn. Bhd.

First of all, sincere thanks to members of Malaysian High Voltage Network (MyHVnet) to put trust in me by selecting me as the new Chairman of MyHVnet. I am delighted that the 2023 Annual General Meeting has been successfully held at TNB Research on 16 January 2023. The establishment of MyHVnet since 2015 has been to provide a platform for academicians from universities and industry practitioners in Malaysia to share their knowledge and experience in the field of high voltage engineering research and applications as well as power system studies.

I would like to take this opportunity to thank Assoc. Prof. Ts. Dr. Hidayat Zainuddin, the former MyHVnet Chairman, and

also to all past Chairmen on their leaderships, commitments and enthusiasms that led to the present achievements of MyHVnet. Over the next two years, it is my turn to take up the responsibility to draw up a strategy to bring MyHVnet to the next level for the benefits of its members. With the continuous support from the MyHVnet committee and members, I believe all the activities and programmes that have been planned can be well organised and executed.

A synergistic collaboration between the academia and the industry is the best mechanism to discover new knowledge, solve technical problems and produce innovative products. In this modern world, one cannot work alone and needs to have strategic partnerships to succeed. I believe MyHVnet is an excellent platform that can make all collaborative effort a success. Lastly, I wish all the best to MyHVnet members and look forward to meet all of you in upcoming events.

MyHVnet 2021-2022 Chairman's Remarks



Assoc. Prof. Ts. Dr. Hidayat Zainuddin,
Universiti Teknikal Malaysia Melaka.

I am pleased that the 2022 Annual General Meeting (AGM) of Malaysian High Voltage Network (MyHVnet) was successfully held at TNB Research Sdn. Bhd. with around 40 MyHVnet members attended. It has been an honour to be given an opportunity to serve MyHVnet for two years, from 2021 until 2022. Definitely, it was a unique and challenging experience especially during the COVID-19 pandemic where many situations became uncertain and all of us needed to adapt to the new normal.

Despite all the challenges, we kept promoting MyHVnet to the academia and industries. We managed to setup the LinkedIn account for MyHVnet and promote our activities through the networking platform. Until today, we have about 160 connections. We also successfully organised the 4th MyHVnet Colloquium (our biennial event) in February 2022 in a hybrid mode

(face-to-face and online) following the concerns of the COVID-19 pandemic. It is also interesting to highlight that we are under progress in developing a new website of MyHVnet. Hopefully, the website will be available to be accessed by the public soon. There were also many activities conducted throughout 2021 and 2022, including seminars, technical talks and industrial visits, all made possible with the help of MyHVnet members.

I hope that MyHVnet can continue to be a platform for academia and industries within the area of high voltage engineering to develop networks, to exchange knowledge, ideas and experience and to collaborate. These can only be materialised through the support and strong engagement among the members. I would like to take this opportunity to thank all MyHVnet members for their contributions towards our shared achievements and successes. Lastly, congratulations to our newly appointed Chairman of MyHVnet, Ir. Ts. Dr. Mohd Aizam Talib of TNB Research. I wish you all the best!

MyHVnet Newsletter's Editorial Board

Advisers: Prof. Dr. Zulkurnain Abdul Malek (Universiti Teknologi Malaysia); Assoc. Prof. Ts. Dr. Hidayat Zainuddin (Universiti Teknikal Malaysia Melaka)

Editor-in-Chief: Assoc. Prof. Eur. Ing. Ir. Ts. Dr. Lau Kwan Yiew (Universiti Teknologi Malaysia)

Editor: Ir. Ts. Dr. Wooi Chin Leong (Universiti Malaysia Perlis)

Contributors: Members of MyHVnet

2022 MyHVnet Colloquium Successfully Held

MELAKA, 14 February 2022 – The 2022 MyHVnet Colloquium, a biennial event for all Malaysian High Voltage Network (MyHVnet) members was successfully held at the Faculty of Electrical Engineering, Universiti Teknikal Malaysia Melaka (UTeM) on 14 February 2022. The 4th MyHVnet Colloquium was organised in collaboration with the IEEE Dielectrics and Electrical Insulation Society (DEIS) Malaysia Chapter. Despite the challenges in organising the colloquium due to strict adherence to the Covid-19 standard operating procedures, this 4th meeting of its series had seen a strong presence of physical and online participants from all over Malaysia. There were about 80 registered participants of whom 56 were presenters.

There were 6 technical tracks, which were Insulation and Electrical Discharges, Transformers, Lightning, Electromagnetic Compatibility, Conductors and Grounding Systems, and

other High Voltage Related Issues. Discussion Corner slots were delivered by 2 invited speakers, namely, Prof. Dr. Normiza Mohamad Nor from Multimedia University with her speech entitled "Grounding System under High Impulse Currents by Field Measurements" and Ir. Ts. Ganesh Kumar Balakrishnan from Tenaga Nasional Berhad with his speech entitled "Distribution Network Substation Digitalisation towards Smart Utility".

MyHVnet would like to thank all the reviewers, participants and organising committee members for their contributions in making the colloquium a success.

Assoc. Prof. Ts. Dr. Hidayat Zainuddin Universiti Teknikal Malaysia Melaka.



Photos taken spontaneously during 2022 MyHVnet Colloquium.

About IEEE DEIS Malaysia Chapter

MALAYSIA, 01 January 2023 – The IEEE Dielectrics and Electrical Insulation Society (DEIS) Malaysia Chapter was established in Malaysia in May 2015 with the aims to enhance networking and stimulate research and development in the field of dielectrics and electrical insulation in Malaysia. Its field of interest is in line with that of DEIS, i.e., the study and application of dielectric phenomena and behavior and the development, characterization and application of all gaseous, liquid and solid electrical insulating materials and systems utilized in electrical and electronic equipment. Through committees, IEEE DEIS Malaysia Chapter hopes to promote the close cooperation and exchange of technical information among its members.

Those joining DEIS will have the possibility of networking with a large number of experts worldwide, including Malaysia (through IEEE DEIS Malaysia Chapter), to show the results of their research activity or remain informed in the latest developments in their field. For more information, please visit:

<http://deis.ieeemy.org/> (IEEE DEIS Malaysia Chapter)

<http://www.ieeedeis.org/> (IEEE DEIS)

News on MyHVnet

In case you missed the previous news on Malaysian High Voltage Network (MyHVnet), Issues 1 to 5 of MyHVnet Newsletter (an initiative for the dissemination of high voltage related news, with particular emphasis on MyHVnet's activities) can be downloaded from the following link:

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



IEEE DEIS Malaysia Chapter

About IEEE DEIS Malaysia Chapter

- > The Institute of Electrical and Electronics Engineers (IEEE) Dielectrics and Electrical Insulation Society (DEIS) Malaysia Chapter was established in Malaysia in 2015.
- > IEEE DEIS Malaysia Chapter's establishment stems from the need of the dielectrics community in Malaysia to enhance networking and stimulate research and development in the field of dielectrics and electrical insulation.

About DEIS

- > DEIS is interested in the study and application of dielectrics from the molecular level, through nano-structured materials, to insulation systems in industrial, commercial, and power system equipment, to emerging applications such as those at high power levels and in biological and other small-scale systems.
- > DEIS supports the entire scope of the field from advancing the basic science, to enhancing the ability of practicing engineers to use emerging dielectric materials, to the development of standards for the prudent application of existing and new insulation systems.



All kind of dielectrics are dealt within DEIS scope: solid, liquid and gaseous dielectrics

Picture courtesy of DEIS

- > The field of interest of DEIS shall be the study and application of dielectric phenomena and behavior and the development, characterization and application of all gaseous, liquid and solid electrical insulating materials and systems utilized in electrical and electronic equipment.
- > DEIS is also involved in the creation of voluntary engineering standards and the recommended practices related thereto.
- > DEIS promotes the close cooperation and exchange of technical information among its members and to this end holds meetings for the presentation of papers and their discussion.
- > Through committees DEIS stimulates research, develops appropriate studies and standards, and sponsors periodic and special publications in the field of dielectrics and electrical insulation.

DEIS Membership

- > Joining IEEE DEIS will offer you the possibility of networking with a large number of experts to show the results of your research activity or remain informed in the latest developments in your field.
- > For more information, please visit:
<http://deis.ieeemy.org/> (IEEE DEIS Malaysia Chapter)
<http://www.ieeedeis.org/> (IEEE DEIS)

MyHVnet 2023/2024 Committee

(...continued from page 1)

Assoc. Prof. Dr. Hidayat Zainuddin from Universiti Teknikal Malaysia Melaka (UTeM). The meeting started with the welcoming speech from the chairman, followed by a report on previous activities, and a financial report from the treasurer. Upon dissolution of the then committee, a new committee was to be appointed, where Ir. Mohd Aizam Talib was tasked with the role of the acting chairman. After the election process, the new MyHVnet committee was formed, as follows:

Chairman

- Ir. Dr. Mohd Aizam Talib (TNB Research Sdn. Bhd.)

Co-chairman

- Assoc. Prof. Ir. Dr. Fairouz bin Mohd. Yousof (Universiti Tun Hussein Onn Malaysia)

Secretary I

- Dr. Noradlina Abdullah (TNB Research Sdn. Bhd.)

Secretary II

- Assoc. Prof. Ir. Ts. Dr. Muhammad Saufi Kamarudin (Universiti Tun Hussein Onn Malaysia)

Treasurer

- Assoc. Prof. Ir. Dr. Rahisham Abd. Rahman (Universiti Tun Hussein Onn Malaysia)

EXCOMM Members (Specific Portfolio)

Industrial Relations and Industrial Visit:

- Assoc. Prof. Ir. Dr. Mohamad Kamarol Mohd Jamil (Universiti Sains Malaysia)
- Ir. Ts. Dr. Wooi Chin Leong (Universiti Malaysia Perlis)
- Huzainie Shafi Abd Halim (TNB Research Sdn. Bhd.)

Newsletter:

- Assoc. Prof. Eur. Ing. Ir. Ts. Dr. Lau Kwan Yiew (Universiti Teknologi Malaysia)
- Dr. Nur Fadilah Ab Aziz (Universiti Tenaga Nasional)
- Dr. Wan Fatinhamamah Wan Ahmad (Universiti Putra Malaysia)

Database and Website:

- Ir. Ts. Dr. Raymond Wong Jee Keen (Universiti Malaya)
- Ir. Dr. Sharin bin Ab Ghani (Universiti Teknikal Malaysia Melaka)
- Dr. Nik Hakimi Nik Ali (Universiti Teknologi Mara)

General:

- Assoc. Prof. Dr. Ramizi Mohamed (Universiti Kebangsaan Malaysia)
- Dr. Noor Syazwani Mansor (Universiti Sains Malaysia)
- Dr. Thien Yee Von (Tunku Abdul Rahman University of Management and Technology)
- Ir. Imran Sutan Chairul (Universiti Teknikal Malaysia Melaka)
- Mohamad Azfar Wajdi Zahari (Keretapi Tanah Melayu Berhad)

After the formation of the new MyHVnet committee, a meeting on the planning of the 2023 activities was discussed. There were many suggestions, which include industrial visits, technical talks, and technical webinars, among others.

A technical visit around TNBR facilities was then carried out. All participants were briefed with the research activities carried out within TNBR's scope, which include lightning tests, partial discharge, gas research, underground cable simulation, high voltage diagnostics, and many others. The AGM was adjourned around 1.00 pm with a group photo session.

Assoc. Prof. Ir. Ts. Dr. Muhammad Saufi bin Kamarudin, Universiti Tun Hussein Onn Malaysia.



Photos during 2023 MyHVnet's AGM.

Staff and Student Exchange between UTeM and HsH

MELAKA, 16 November 2022 – Recently, Faculty of Electrical Engineering, Universiti Teknikal Malaysia Melaka (UTeM) received an academic visit by two professors from the Hanover University of Applied Sciences and Art Hannover (HsH), Germany. The visit that took place from 11 to 16 November 2022 was part of staff exchange activity between both universities. One of the professors, Prof. Dr. Dieter Stolle delivered a lecture in an Engineering Seminar course slot, entitled "Power Cable Technology" to the final year undergraduate electrical engineering students. Meanwhile, Prof. Ruediger Kutzner conducted lectures and laboratory sessions on "Modern Control System Engineering with MATLAB/Simulink" in the Control System Engineering course slot for the 3rd year undergraduate mechatronics engineering students.

Earlier, from 11 to 23 October 2022, three UTeM lecturers went to Hannover for the staff exchange activity. One

of the lecturers was Assoc. Prof. Dr. Hidayat Zainuddin, who is also the member of MyHVnet. In Hanover, Dr. Hidayat delivered a lecture entitled "High Voltage Insulation" to the electrical engineering students at HsH. This activity of staff exchange or staff mobility between UTeM and HsH has started since 2016 following the MoU and good relationship between both universities. In fact, this collaboration also involves student mobility programme whereby, currently, a total of four UTeM students are studying at HsH and four HsH students are studying at UTeM for a period of one semester. Hopefully this collaboration will benefit both universities especially for students' exposure and development.

Assoc. Prof. Ts. Dr. Hidayat Zainuddin Universiti Teknikal Malaysia Melaka.



Photos during staff exchange activities between UTeM and HOH.

Networking with TNB Research

(...continued from page 1)

Research. The laboratories visited were the substation, cable and high voltage laboratories. The substation laboratory personnel presented their main research on the condition monitoring of gas insulated switchgears and the method to safely dispose of sulfur hexafluoride (SF_6) gas. The cable laboratory personnel presented their projects on fault and partial discharge detections of overhead and underground cables. The high voltage laboratory personnel demonstrated their high voltage AC, DC and impulse facilities and the partial discharge chamber. Both the participants and the researchers from TNBR showed interest to collaborate in future research projects. It is the organisers' aim that this technical visit could strengthen the cooperation between the industries and the academia.

Assoc. Prof. Ir. Dr. Mohd Fairouz Bin Mohd Yousof, Universiti Tuh Hussein Onn Malaysia.



TNBR's representative (right) explaining research at TNBR.

DEIS Malaysia's Presence at 2022 MyHVnet Colloquium

MELAKA, 15 February 2022 – The 2022 Malaysian High Voltage Network (MyHVnet) Colloquium was successfully held at Universiti Teknikal Malaysia Melaka (UTeM), on 14 February 2022. The colloquium was held in hybrid mode with a physical session in UTeM and an online session via Webex platform.

The colloquium, co-organised by IEEE Dielectrics and Electrical Insulation Society (DEIS) Malaysia Chapter and MyHVnet, has seen a strong presence of the high voltage community in Malaysia, as well as members of the DEIS Malaysia Chapter.

In the 2022 MyHVnet Colloquium, the topics of interest included lightning, electromagnetic compatibility, insulation

and electrical discharges, conductors and grounding systems, transformers, and other high voltage-related issues. The colloquium, which consisted of 2 keynote speeches and about 60 paper presentations, was an excellent opportunity for researchers and engineers to present and discuss their latest findings. More details about MyHVnet Colloquium are available at <https://ivat.utm.my/myhvnet/news/>

The DEIS Malaysia Chapter wishes to thank all committee members and participants for making the colloquium a success. The DEIS Malaysia Chapter looks forward to engaging in more events like this.

Ir. Ts. Dr. Raymond Wong Jee Keen, Universiti Malaya.



Group photos

Technical Visit to UKM High Voltage Laboratory

BANGI, 18 February 2022 – A technical visit to the high voltage laboratory of Universiti Kebangsaan Malaysia (UKM) was conducted on 17 February 2022. The main purpose of the visit was to provide advice on the suitable locations for the high



Photo during discussion.

voltage unit installation. Assoc. Prof. Ir. Dr. Norhafiz Azis, Prof. Ir. Dr. Mohd Zainal Abidin Kadir, Assoc. Prof. Dr. Jasronita Jasni and En. Farizal Muzammil from Universiti Putra Malaysia as well as Ir. Dr. Aizam Talib from TNB Labs Sdn. Bhd. visited UKM. The UKM representatives were Assoc.



Photo during laboratory visit.

Prof. Dr. Ramizi Mohamed, Dr. Syahirah Abd Halim, Dr. Nor Azwan Mohamed Kamari and Dr. Yushazad Yusof .

Assoc. Prof. Ir. Dr. Norhafiz Azis, Universiti Putra Malaysia.

Discussion Corner: Negative Corona Discharge from Protrusion on Parallel Plane Electrodes in Gas Insulation

Utilization of gas-insulated switchgears (GIS) in urban substations are becoming popular due to their compactness and high reliability. Unfortunately, failure in the insulation, which is mainly caused by foreign metal particles, is the primary reason of GIS apparatus malfunction. The metal particle, particularly a wire shape, has a unique motion behaviour in the GIS under DC stress. It could stand on the enclosure body inside the GIS and acts as a protrusion to generate negative corona discharges. Since the existing works mostly conducted the investigation through an experimental approach, we investigated this phenomena by developing a simulation model using Finite Element Method (FEM). Our work could provide a better understanding about corona discharge characteristics generated from this configuration.

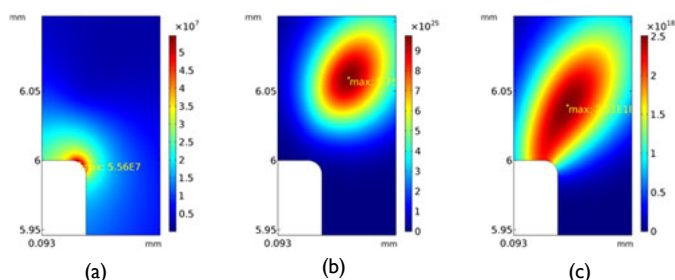


Figure 1. Spatial distribution of the a) electric field (V/m), b) ionization rate ($1/m^3s$) and c) positive ions density ($1/m^3$) at different times (A = 7.299 μs , B = 7.382 μs and C = 7.827

Our model employed three drift-diffusion equations to investigate charged species (electrons, positive ions, and negative ions) transport process and Poisson equation to analyse the electric field distribution in the gap. In our work, we investigated the spatial distribution of the electric field, ionisation rate, electrons, positive ions and negative ions in the gap at the start of the pulse development, peak of the pulse and the decay process. It is found that due to the difference in the physical geometry compared to the needle plane configuration, the distribution of the observed parameters in the wire particle grows diagonally, as depicted in Figure 1.

In addition, we also investigated the effect of wire particle geometries such as the length, diameter size and tip of the particle on the pulse characteristics. We discovered that the particle length and diameter have influence on the pulse characteristics but variation of the particle tip radius does not show a very significant effect.



Daniar Fahmi
Universiti Malaysia



Hazlee Azil Ilias
Universiti Malaysia

2023 IEEE DEIS Malaysia Chapter AGM

KAJANG, 16 January 2023 – The 2023 Annual General Meeting (AGM) of the Institute of Electrical and Electronics Engineers (IEEE) Dielectrics and Electrical Insulation Society (DEIS) Malaysia Chapter was successfully held on 16 January 2023 at TNB Lab Sdn. Bhd. physically and Microsoft Teams online concurrently. The meeting was attended by active members of the IEEE DEIS Malaysia Chapter and chaired by the Chapter Chair Assoc. Prof. Ir. Dr. Nor Asiah Muhamad.

The meeting began with an opening remark by Assoc. Prof. Ir. Dr. Nor Asiah, followed by the endorsement of the 2022 AGM minutes and the presentation of the chapter's activities. Next, the Treasurer Dr. Amir Izzani Mohamed presented account matters. Prior to the dissolution of the 2022 committee, Assoc. Prof. Ir. Dr. Nor Asiah thanked all the committee members and DEIS members for their voluntary contribution to ensure the success of the DEIS Malaysia Chapter.

The meeting continued with the election of the 2023/2024 committee members of the DEIS Malaysia Chapter, with the list of committee members summarised as follows:

Chair

- Assoc. Prof. Ir. Dr. Hazlee Azil Ilias (Universiti Malaya)

Past Chair

- Assoc. Prof. Ir. Dr. Nor Asiah Muhamad (Universiti Sains Malaysia)

Vice Chair

- Assoc. Prof. Ir. Dr. Norhafiz Azis (Universiti Pura Malaysia)

Secretary

- Ir. Ts. Dr. Wooi Chin Leong (Universiti Malaysia Perlis)

Treasurer

- Ts. Dr. Nik Hakimi Nik Ali (Universiti Teknologi MARA)

Executive Committee

- Assoc. Prof. Ir. Dr. Mohd Fairouz Mohd Yusof (Universiti Tun Hussein Onn Malaysia)
- Assoc. Prof. Ir. Ts. Dr. Muhammad Saufi Kamarudin (Universiti Tun Hussein Onn Malaysia)
- Ir. Ts. Dr. Wong Jee Keen Raymond (Universiti Malaya)
- Ts. Dr. Mohd Shahril Ahmad Khair (Universiti Teknikal Malaysia Melaka)
- Dr. Kuan Tze Mei (Universiti Tenaga Nasional)
- Dr. Thien Yee Von (Tunku Abdul Rahman University of Management and Technology)

The new Chapter Chair, Assoc. Prof. Ir. Dr. Hazlee Azil Ilias, later delivered his welcoming speech to the new committee line-up and made a brief planning for the activities in 2023. Assoc. Prof. Ir. Dr. Hazlee is hopeful that the DEIS Malaysia Chapter will continue to contribute actively in the field of dielectrics and electrical insulation and looking forward to lead the DEIS Malaysia Chapter to a greater height.

Ir. Ts. Dr. Wooi Chin Leong, Universiti Malaysia Perlis.



Group photo during 2023 DEIS Malaysia Chapter's AGM.

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



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 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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Universiti Teknologi Malaysia, 81310 Johor Bahru, Malaysia.

DEIS Malaysia' Presence at Research and Innovation Engineering Day 2022

MELAKA, 16 June 2022 – The Research and Innovation Engineering Day 2022 (RADIATE 2022) was organized by the Faculty of Electrical Engineering (FKE), Universiti Teknikal Malaysia Melaka (UTeM) on 15 June 2022. The IEEE Dielectrics and Electrical Insulation Society (DEIS) Malaysia Chapter's committee members would like to congratulate Group SI-1 on receiving the "Anugerah Khas Industri" sponsored by the IEEE DEIS Malaysia Chapter during RADIATE 2022. Ts. Dr. Mohd Shahril Ahmad Khair represented the IEEE DEIS Malaysia Chapter to present the "Anugerah Khas Industri" to the representative from Group SI-1 IDP during the event.



Ts. Dr. Mohd Shahril (right) presenting the "Anugerah Khas Industri" award.

Ts. Dr. Mohd Shahril Ahmad Khair , Universiti Teknikal Malaysia Melaka.

Utilising Nanoparticles for Liquid Insulation Applications

KUALA LUMPUR, 23 September 2022 – A research talk entitled "Utilising nanoparticles for liquid insulation applications" was delivered by Dr. Mohamad Zul Hilmey Makmud, from Universiti Malaysia Sabah (UMS), on 22nd September 2022. The talk was part of the research visit activities by Dr. Zul Hilmey at the Universiti Malaya High Voltage Laboratory (UMHVL) at the Department of Electrical Engineering, Faculty of Engineering, Universiti Malaya.



Dr. Zul Hilmey delivering his talk.

Ir. Ts. Dr. Raymond Wong Jee Keen, Universiti Malaya.



Group photo.

Technical Visit to Universiti Malaya High Voltage Laboratory

KUALA LUMPUR, 12 January 2022 – On 11 January 2022, three academic staffs from Universiti Kebangsaan Malaysia (UKM) visited the Universiti Malaya High Voltage Laboratory (UMHVL) at the Department of Electrical Engineering, Faculty of Engineering, Universiti Malaya. The purposes of the visit were to obtain more information regarding setting up a new high voltage laboratory and to seek advice on laboratory safety requirements.

During the visit, the Head of UMHVL, Assoc. Prof. Ir. Dr. Hazlee Azil Ilias, who is also the Vice Chair of IEEE Dielectrics and Electrical Insulation Society (DEIS) Malaysia Chapter and the Counselor of IEEE Universiti Malaya Student Branch, introduced the facilities available at UMHVL and explained the activities carried out at the laboratory and the laboratory safety requirements. After that, the delegates visited UMHVL to gain a better insight into the laboratory.



Group photo.

Assoc. Prof. Ir. Dr. Hazlee Azil Ilias, Universiti Malaya.

High Voltage Engineering: From Theory to Practice

SHAH ALAM, 27 January 2022 – On 26 January 2022, a webinar was organised by the School of Electrical Engineering, College of Engineering, Universiti Teknologi MARA (UiTM) Shah Alam entitled "High Voltage Engineering: From Theory to Practice". The webinar was conducted over the Webex online platform with Assoc. Prof. Ir. Ts. Dr. Azrul Mohd Ariffin from Universiti Tenaga Nasional (UNITEN), who is also an Executive

Committee Member of the IEEE Dielectrics and Electrical Insulation Society (DEIS) Malaysia Chapter, serving as the invited speaker. The programme aimed to give insights into the fundamentals of high voltage engineering and its applications in the real world. Around 33 participants joined the webinar, mostly third-year electrical engineering students taking the high voltage course. The webinar also served as a platform for the DEIS Malaysia Chapter to promote about

the DEIS society and its activities, in order to encourage more memberships from students and those interested in the areas of dielectrics and electrical insulation for high voltage applications. It is hoped that more programmes of this nature will be organised in the future

Ir. Ts. Dr. Raymond Wong Jee Keen, Universiti Malaya.

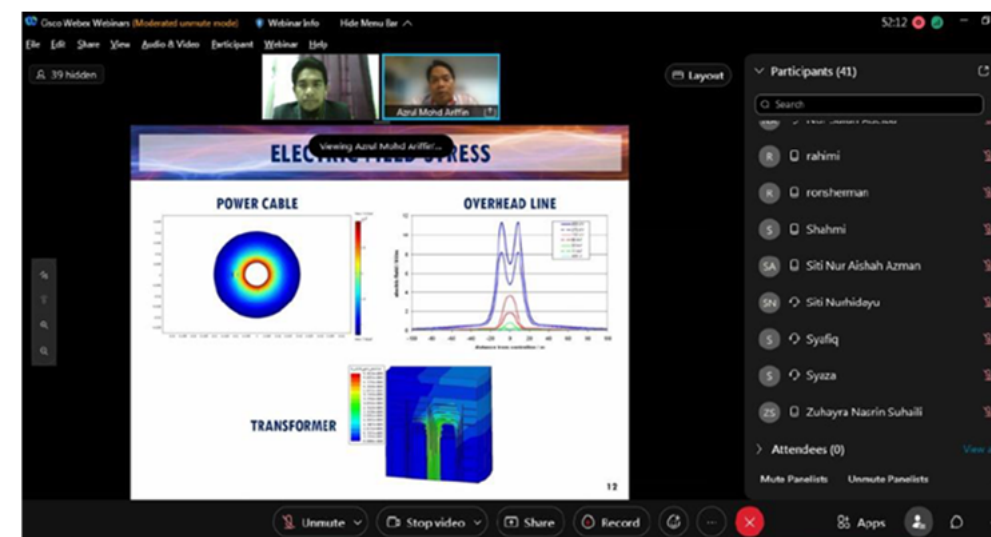


Photo during webinar.

Discussion Corner: Explosion Proof Protection Technology for High Voltage Electrical Equipment

Hazardous atmosphere classified areas are those where there is a risk of fire or explosion owing to the presence of volatile gases or dust. Hazardous area classifications are a categorisation system that identifies the danger associated with certain volatile compounds and calculates the proper safeguards required to limit the risk.

Oil and gas rigs, processing refineries, chemical production facilities, flammable liquids storage facilities, fuel transportation, gas stations, paint and paper manufacturing facilities, and other locations are frequently included in this list, though it is not all-inclusive and many new locations may be designated as hazardous. An area has a hazardous environment when there are high concentrations of explosive or flammable gases, dusts, or vapours in the air. A fire or explosion is likely in such an atmosphere when three crucial conditions are met, namely, source of ignition, oxygen and combustible materials.

To protect facilities from a potential explosion, a method of assessing and recognising a potentially dangerous region is required. In order to prevent an explosion and ensure human safety, correct equipment selection and installation are required. The methods used to categorise an installation differ depending on where in the world it resides. There are two primary categories. This is referred to as zoning in nations that follow the International Electrotechnical Commission (IEC) ideology. In North America, however, installations are categorised by classes, divisions, and groups to determine the necessary level of safety.

Explosion-proof does not always imply that anything can resist an explosion from the outside. A product, such as an explosion resistant junction box, must be able to contain any explosion that begins inside the housing due to any internal sparks and prevent igniting vapours, gases, dust, or fibres in the air around it in order to be considered explosion proof.

When storing equipment in hazardous regions, it is critical to utilise high-quality, certified explosion-proof equipment to decrease the danger of explosions and fires to employees and industrial properties. When dealing with explosion-proof equipment, there are two certifications, namely, the potentially explosive ("Ex") atmospheres (abbreviated as ATEX in French words "ATmosphères EXplosibles") and the IEC System for Certification to Standards Relating to Equipment for Use in Explosive Atmospheres (IECEx).

The zone classification for gas and dust according to ATEX is shown in Table 1. The most common applied types of protection according to the IEC 60079 standard are shown in Table 2.

Table 1. Zone classification for gas and dust according to ATEX

Gas Atmosphere	
Zone 0	A location where explosive gas mixture is constantly present (ex. the inside of a fuel tank).
Zone 1	A location where explosive gas mixtures could exist while the plant is operating normally.
Zone 2	A spot where the explosive gas mixture is occasionally found but is not regularly present.
Dust Atmosphere	
Zone 20	A location where the explosive powder combination is constantly present (ex. the inside of fuel tank).
Zone 21	A location where explosive powder may be present when the facility is operating normally.
Zone 22	A place where the explosive powder mixture is occasionally but temporarily present, but not regularly there.

Table 2. Type of protection according to IEC 60079

Type	Ex Marking	IEC Code
General rules		EN-60079-0
Oil immersed	Ex "o"	EN-60079-6
Pressurization	Ex "p"	EN-60079-2
Power filling	Ex "q"	EN-60079-5
Flameproof enclosure	Ex "d"	EN-60079-1
Increased safety	Ex "e"	EN-60079-7
Intrinsic safety	Ex "i"	EN-60079-11
Non sparking	Ex "n"	EN-60079-15
Encapsulation	Ex "m"	EN-60079-18

For the conclusion, explosion proof equipment is critical, especially when working with potentially dangerous applications or settings. By ensuring that the equipment is appropriately certified, it can be certain that the safety of employees and the facilities is well protected. As a result, it is critical for equipment, particularly electrical and electronic equipment, operating in an atmosphere that does not reduce a spark that might ignite the gases, resulting in an explosion. Explosion-proof technologies ensure that equipment will never produce enough energy to trigger an explosion.

Mohamad Syafiq Masri, Devan A/L Karuppanan, Muhammad Saufi Kamarudin, Universiti Tun Hussein Onn Malaysia.

PhD Opportunities: University of Malaya High Voltage Research Group



Greetings,

We are pleased to invite applications for PhD study at University of Malaya High Voltage Research Group (UMHVRG). The scopes of the projects include but are not limited to:

- Partial discharge measurement and simulation
- Dielectric material characterisations
- Artificial intelligence techniques in condition monitoring
- Optimisation techniques in high voltage equipment parameters' estimation
- Other high voltage engineering studies

STUDY MODE: Full-time research (Minimum 2 years, maximum 4 years)

REQUIREMENT:

- Academic qualification:
 - ♦ [Bachelor's Degree in Electrical Engineering with CGPA \geq 3.7 or equivalent] OR;
 - ♦ [Bachelor's Degree in Electrical Engineering with CGPA \geq 3.0 or equivalent] AND [Master by research in Engineering OR Master by Coursework in Engineering with CGPA \geq 3.00]
- Self-funded or sponsored
- Proficient in English language (written and spoken)
- Pleasant personality, hardworking and self-motivated
- Ability to carry out research work independently, quickly and efficiently
- Willing to write review and research papers

Advantages of pursuing PhD in UMHVRG:

- Widely experienced supervisors
- Great high voltage laboratory facilities
- Excellent working environment
- Friendly and helpful colleagues
- Top-class facilities in University of Malaya
- Become a Graduate Research Assistant with a salary up to RM 3,200 per month

Interested candidate please send your resume with academic transcripts and research proposal to Associate Professor Ir. Dr. Hazlee Illias at h.illias@um.edu.my anytime throughout the year.

For more information about University of Malaya High Voltage Laboratory, please visit <http://umhvl.um.edu.my>

For more information about the application of PhD study at the University of Malaya, please visit <https://www.um.edu.my/doctorate>

Thank you.

Knowledge Sharing on Lightning Safety and Understanding to Local Community

PADANG BESAR, 22 July 2022 – The Faculty of Electric Engineering and Technology (FTKE), Universiti Malaysia Perlis (UniMAP), in collaboration with the IEEE Dielectrics and Electrical Insulation Society (DEIS) Malaysia Chapter and the IEEE Region 10, successfully organised a knowledge sharing session entitled “Lightning: Safety and Understanding” with a village community of Padang Besar.



Interviews with villagers.

The knowledge transfer programme was funded through the “Reaching Local Initiatives” grant supported by the IEEE Region 10 Educational Activities Committee. A total of 5

lecturers from FKTE UniMAP, namely Ir. Ts. Dr. Wooi Chin Leong, Assoc. Prof. Ir. Ts. Dr. Syahrin Nizam Md Arshad @ hashim, Prof. Ir. Ts. Dr. Muzamir Isa, Ts. Dr. Muzaidi Othman and Ir. Ts. Dr. Ahmad Zaidi Abdullah, participated as committee members for the activity. The main objectives of the activity were to provide some basic knowledge about lightning and ways to avoid lightning strike during thunderstorm.

The programme was attended by 50 local residents. Most of the villagers showed interests on lightning and some of them were amazed on how lightning could be generated by thunderclouds. They also showed better understanding on the lightning safety and the importance of its basic protection.

The programme was the first of its kind about lightning safety and understanding organised for the local community there. The programme was inspired by the fact that the village community live nearby paddy fields and is highly exposed to lightning threat. The community, however, is lacked of knowledge in lightning safety and protection. With the explanation on lightning safety and protection, the community is hoped to be able to understand the importance of lightning protection and preventive measures that can be taken during thunderstorms.

Ir. Ts. Dr. Wooi Chin Leong, Universiti Malaysia Perlis.



Photos during knowledge sharing session.

UNIMAS Technical Visit to UMHVL

KUALA LUMPUR, 10 June 2022 – On 9th June 2022, three academic staffs from Universiti Malaysia Sarawak (UNIMAS) visited the Universiti Malaya High Voltage Laboratory (UMHVL) at the Department of Electrical Engineering, Faculty of Engineering, Universiti Malaya. The purposes of the visit were to obtain more information regarding setting up a new high voltage laboratory and to seek advice on the laboratory safety requirements.

During the visit, the Head of UMHVL, Assoc. Prof. Ir. Dr. Hazlee Azil Illias, who is also the Vice Chair of IEEE Dielectrics and Electrical Insulation Society (DEIS) Malaysia Chapter and the Counselor of IEEE Universiti Malaya Student Branch, introduced the facilities available at UMHVL and explained the activities carried out at the laboratory and the laboratory safety requirements. After that, the delegates visited UMHVL to gain a better insight into the laboratory.



Group photo.

Ir. Ts. Dr. Raymond Wong Jee Keen, Universiti Malaya.

IEEE DEIS Malaysia Chapter 2022 Annual General Meeting

MELAKA, 15 February 2022 – The 2022 Annual General Meeting (AGM) of the Dielectrics and Electrical Insulation Society (DEIS) Malaysia Chapter was successfully held on 14 February 2022 at Universiti Teknikal Malaysia Melaka (UTeM) and Webex Online concurrently. The meeting was attended by active members of the IEEE DEIS Malaysia

Chapter and chaired by the Chapter Vice Chair Assoc. Prof. Ir. Dr. Hazlee Azil Illias.

The meeting began with an opening remark by Assoc. Prof. Ir. Dr. Hazlee Azil Illias, followed by the endorsement of the 2021 AGM minutes and the presentation of the chapter’s activities. Next the treasurer Dr Amir presented account matters. Lastly, a brief planning for the activities in 2022 was discussed.



Group photo.

Ir. Ts. Dr. Raymond Wong Jee Keen, Universiti Malaya.

Knowledge Sharing from Industry

ARAU, 17 June 2022 – On 17 June 2022, the IEEE Dielectrics and Electrical Insulation Society (DEIS) Malaysia Chapter and Malaysian High Voltage Network (MyHVnet) organised a knowledge sharing webinar by industry experts to-



Photo taken during the webinar.

gether with University Malaysia Perlis. The webinar was moderated by Ir. Ts. Dr. Wooi Chin Leong, who is a committee member of the IEEE DEIS Malaysia Chapter and MyHVnet. A total of 82 participants attended the webinar. The participants came from various backgrounds including industry and academic as well as students. There were 2 speakers from industry, namely, Ir. Wong Tian Seng and Ir. Baharin Chik, sharing their experience during the webinar. Both of them had more than 20 years' experience in the industry. They shared the topic regarding the introduction to consultancy services in construction industry and power system study using commercial engineering software. The webinar ended with an interesting questions-and-answers session.

Ir. Ts. Dr. Wooi Chin Leong, Universiti Malaysia Perlis.

Welcome to UTM Institute of High Voltage and High Current

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

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 visits to IVAT.

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 IELTS certificate an IELTS Band 6.0

Why Study at IVAT?

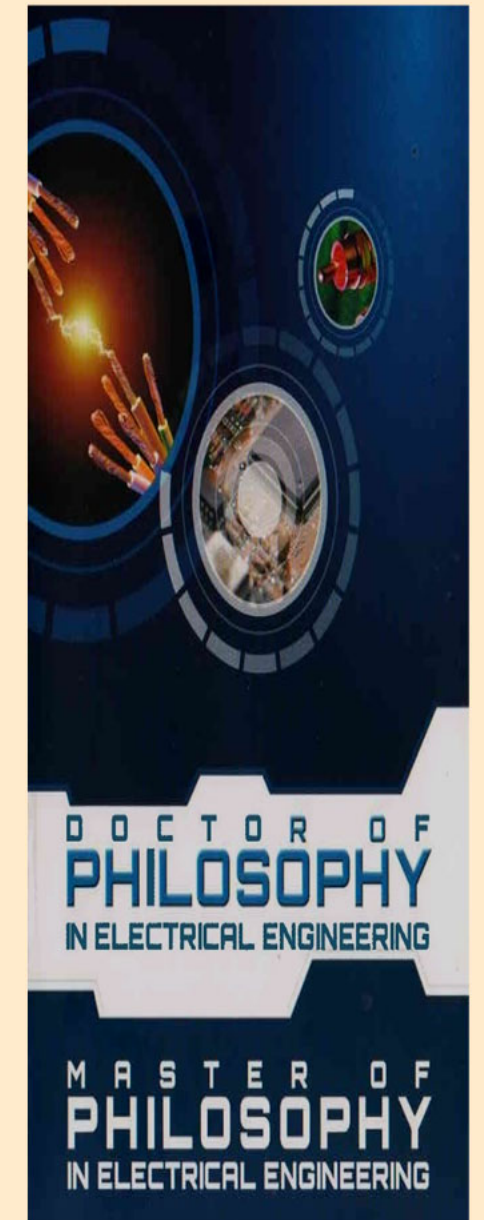
- Our field of electrical and electronic engineering is ranked Top 100 in the world (according to QS World University Rankings by Subject 2022)
- Our high voltage laboratory is the largest in Malaysia
- We have well-equipped high voltage facilities
- We have widely experienced supervisors working on 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 ivat@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/>



About MyHVnet

High voltage research and development activities continue to prosper in Malaysia due to rapid urbanisation across the country. Each year, an enormous amount of expenditure is allocated for the development of high voltage infrastructure and its relevant expertise to ensure its sustainability. This indirectly leads to an increasing number of players, both at the university and industry levels. While this certainly brings positive impact to the field of high voltage engineering, it can, sometimes, be difficult for interested parties to approach the right experts in a specific high voltage related area, e.g., lightning protection, condition monitoring and diagnosis, and insulation design. Consequently, more effective research and development activities related to high voltage engineering may have been hindered.

To address the above issue, the possibility of setting up an informal networking group relevant to high voltage engineering has been looked into. This leads to the idea of the estab-

lishment of Malaysian High Voltage Network (MyHVnet) in 2014. MyHVnet will hopefully serve as a “one-stop” platform for members from various organisations (universities and industries) across Malaysia for the effective communication of high voltage related research and development.

The main objectives of the establishment of MyHVnet are:

- i) To serve as a platform for the discussion of high voltage related research and development among member organisations.
- ii) To raise the awareness of the research and development capabilities of member organisations to high voltage related industries.
- iii) To lobby for high voltage related research funding.



Happy faces at 2023 MyHVnet's Annual General Meeting.

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