

ENERGY1 Asia - Virtual instructor-led Training (Online)

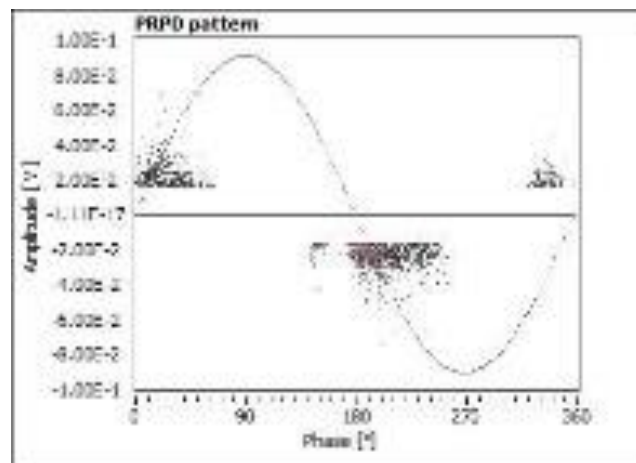
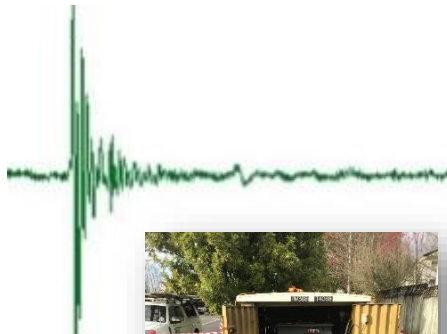
Due to the recent developments with COVID-19 we have, for the health and safety of our speakers and attendees, our selected multi-day courses will be delivered live online led by experience practitioners. This will enable you to experience a similar engagement experience to our successful traditional classroom setting which includes exercises, answering your question and provide feedback – all without having to travel anywhere!

Partial Discharge Assessment

(Measurement, Data Analysis & Interpretation)

Learn about how to evaluate the conditions of the medium and high voltage electrical assets by performing Partial Discharge test and analysis. (Cables, Switchgear, Transformer and Rotating Machines)

10th – 13th Jan 2022 | 09:00 – 13:30 (GMT+8) | Online Virtual instructor-led Training



Partial Discharge Assessment (4 Days) Virtual instructor-led Training

These 4 days **Virtual instructor-led Training** will describe from the technical point of view the existing techniques and the assessment procedure for each individual asset (from cables, switchgear, Transformer, and rotating machines), how to evaluate the data and how to decide what to do (based on the asset tested and test result).

In-depth Partial Discharge and measurement techniques

The training will begin with partial discharge phenomena, from the definition, the physical process behind it and the representation used. This will expand into the Internal Pd phenomena using the physical laws which will help participant better understand the shape of the graphs. Participant will have complete understanding of the partial discharge phenomena and why they are triggered within insulation systems.

The instructor will further explain how to do the measurement, type of sensors, position, procedure for the different asset type and type of Pd measurement. Participant will learn how to properly perform the measurement and evaluate the test results.

Data analysis and interpretation: (Cables, Switchgear, Transformer and Rotating Machines) – 3 Days

One of the most difficult tasks is interpreting the PD data and determining the time an insulation system may remain in service before damaging and costly failure can occur. The instructor will show and explain the principles of data analysis for each asset (**such as cables, switchgear, Transformer, and rotating machines**) and type of test (**online and offline**).

Real PD data in form of PDPattern (graph analysed to study the partial discharge phenomena) eg: simplified drawings will be used to explain the data interpretation. Examples of PD maps will be shown to explain how to interpret the result. With this participant will be able to evaluate the condition of the asset tested, thus perform the proper follow up action.

Participant will be able to apply the principles and the ways of interpreting the data to any technology (instrument) even if different technology has different software as the principles is still the same. At the end of the training, the attendees will be able to select the right technology based on the asset/test they want to perform. The instructor will also further discuss any particular instrument attendees are using.

The objective of the training is to improve existing knowledge or provide a different approach in case there are focus on a single PD technology, data acquisition procedure with a step by step guidelines and best practices.

Advance your knowledge and learn about:

- Physical knowledge of partial discharge phenomena.
- PD Pattern analysis.
- Partial discharge measurement techniques and measurement limitations.
- Capability of selecting the right PD Acquisition unit based on the type of PD test to be done.
- Capability of selecting the right PD sensor based on the type of asset and acquisition unit.
- PD Data analysis principles for each asset / test.
- How PD Map is built and how to interpret the results
- Assessment of the asset based on the PD data analysis results.
- Capability of selecting the right following action based on the assessment results.

This program is intended for:

This comprehensive course will be valuable to all levels of engineers and managers dealing with condition assessment of medium and high voltage electrical assets who work in the power industry from generator companies to transmission and distribution system operators. Engineers working in oil and gas industry who are involved in performing PD measurement in Critical MV assets such as Motors, distribution transformers, cables and switchgears will gain from the course.

- Electrical engineers: to learn about partial discharge and gain knowledge.
- Engineers interested on PD data analysis and interpretation.
- Asset managers: to evaluate the condition of their assets.
- Project engineer/ manager involved in new project who want to have a clear idea of what is needed and how to evaluate the different solutions available in the market.
- Maintenance engineers/technicians: to perform condition assessment test and/or re-commissioning after repair.
- Engineering and maintenance personnel who are involved in condition assessments of electrical assets.
- Company who employed 3rd party to perform partial discharge testing: will learn what information to look for in order to do the correct analysis based on the asset/test performed. This will help to evaluate the test reports provided by third party contractors and in selecting the right test follow up action.
- Any industries/engineers involved with: **Cables (MV: 6kV – 35kV / High and Extra HV: 66kV – 500kV), Switchgear (AIS 6kV – 35kV / GIS: 35kV – 500kV), Transformers (MV: 6kV – 35kV/ HV and EHV: 66kV – 500kV), Motors (6.6kV – 11kV / 17.5kV) and Generators (6.6 – 30kV).**

Partial Discharge Assessment (4 Days) Virtual instructor-led Training

DAY 1 (4 Hours)

In-depth Partial discharge & Measurement

Definition of Partial discharge

- Standard definition
- Graphical representation

Partial discharge classification

- Type of partial discharge phenomena

Partial discharge process

- Physical explanation for inception of partial discharge in internal voids
- Partial discharge process explanation
- Representation of the ideal process under AC voltage

Partial discharge phenomenon representation

- Phase Resolved PD Pattern

Partial discharge first identification based on Phase Resolved PD Pattern

- PD Pattern analysis for the basic types of partial Discharge

Partial discharge apparent charge measurement

- PD apparent charge
- PD measurement principle and limitation
- PD measurement limitations mitigation
- Type of PD detectors
- PD measurement applications
 - Factory tests
 - Field tests

Partial discharge detection principles

- Type of measurement circuits

Type of PD sensors

- Conductive sensors
- Inductive sensors
- Antenna sensors
- Acoustic sensors

Delivered values and limitations

Partial discharge assessment on Cables & Switchgears Cables

Cable systems

- Signal propagation principle
- Measurement limitations

Online PD measurement

- Test setup
- Types of PD sensors used
- Generic test procedure

PD data interpretation principle

What to do if PD is detected

- PD Data analysis
- Cable assessment flow chart based on Online PD measurement result

Case Study: 33kV cable system – PD in a transition joint Online exercise on data interpretation

DAY 2 (4 Hours)

Partial discharge assessment on Cables & Switchgears Cables

Offline PD measurement

- Test setup
- Types of High voltage generator used
- Types of PD sensors used
- Generic test procedure for VLF PD test

PD data interpretation principle for VLF PD test

What to do if PD is detected

- PD Data analysis
- Cable assessment flow chart based on Offline PD measurement result

Case Study: 11kV cable system assessment Online exercise on data interpretation

Comparison Online vs Offline

Air / Gas Insulated switchgear system

Online PD measurement

- Test setup
- Types of PD sensors used
- Generic test procedure

PD data interpretation principle

What to do if PD is detected

- PD Data analysis
- Switchgear assessment flow chart based on Online PD measurement result

Case Study: 33kV Switchgear – PD on cable box Online exercise on data interpretation

Offline PD measurement

- Test setup
- Type of High voltage generator used
- Types of PD sensors used
- Generic test procedure

PD data interpretation principle

What to do if PD is detected

- PD Data analysis
- Switchgear assessment flow chart based on Offline PD measurement result

Case Study: 33kV Switchgear – PD on components surfaces Online exercise on data interpretation

Comparison Online vs Offline

Partial Discharge Assessment (4 Days) Virtual instructor-led Training

DAY 3 (4 Hours)

Partial discharge assessment on Oil Filled & Dry Type Transformers

Oil Filled Transformers & Dry Type Transformers:

- Signal detection principles
- Measurement limitations

Online PD measurement

- Test setup
- Types of PD sensors used
- Generic test procedure

PD data interpretation principle

What to do if PD is detected

- PD Data interpretation
- Transformer assessment flow chart based on Online PD measurement result

Case Study: 11/0.4kV Oil Filled transformer – PD in the tank

Offline PD measurement

- Test setup
- Types of High voltage generator used
- Types of PD sensors used
- Generic test procedure
- PD measurement outcomes and information required for a correct analysis

PD data interpretation principle

What to do if PD is detected

- PD Data interpretation
- Transformer assessment flow chart based on Offline PD measurement result

Case Study: 25/0.75kV Oil Filled transformer – PD in the tank

Online exercise on data interpretation

Comparison Online vs Offline

CERTIFIED COMPETENCY CERTIFICATE

Having the ability to be competent in conducting Partial Discharge once you are back at your workplace is crucial for every participant.

This 4-day online VILT on partial discharge assessment will come with a certificate to certify your competency in conducting partial discharge assessment.

5 different levels of competency certificate are provided according to the exam result and training session followed

Successful participant will be certified as competent in the following:

- PD measurement principles
- Detection techniques
- PD assessment strategies on "Asset"

DAY 4 (4 Hours)

Partial discharge assessment on Rotating machines:

Main assets characteristics and classification

- Insulation system characteristics
- Rotating machines classification

Partial discharge phenomena in High voltage rotating machines:

- Type of PD Phenomena
- Signal detection principles
- Measurement limitations

Online PD measurement

- Test setup for detecting the PD phenomena in the different Rotating Machines
- Types of PD sensors used
- Generic test procedure
- PD measurement outcomes and information required for a correct analysis

PD data interpretation principle

- PD signal identification
- PD signal amplitude comparison
- PD signal trend analysis

What to do if PD is detected

- Hydro Generator assessment flow chart based on Online PD measurement result
- Air cooled Generator assessment flow chart based on Online PD measurement result
- Hydrogen cooled Generator assessment flow chart based on Online PD measurement result
- Motor assessment flow chart based on Online PD measurement result

Case Study: 11kV Motor – PD in the motor leads

Offline PD measurement

- High Frequency PD measurement
- Low Frequency PD measurement
- Test setup for detecting the PD phenomena in the different Rotating Machines
- Types of High voltage generator used
- Types of PD sensors used
- Generic test procedure
- PD measurement outcomes and information required for a correct analysis

PD data interpretation principle

- PD signal identification
- PD signal amplitude trend

Case Study: 11kV Motor – PD in the cable box and winding

Online exercise on data interpretation

Comparison Online vs Offline

Registration Form

Partial Discharge Assessment (4 Days) Online Virtual instructor-led Training

Attend full 4 days or choice of Electrical Assets (From Cables, Switchgear, Transformers, Rotating Machines)

In-depth PD and measurement techniques / PD assessment on Cables and switchgear (2 Days)	PD assessment on Transformers (Oil / Dry) (1 Day)	PD assessment on Rotating Electrical Machines (1 Day)	PROGRAM DETAILS ONLINE Virtual instructor-led Training Date: 10 th – 13 th Jan 2022 Time: 09:00 – 13:30 (GMT+8)
USD 1099 ()	USD 599 ()	USD 599 ()	STEPS TO REGISTER: Simply fill up the registration form and email it to: Email to : registration@petro1.com.my Call us : +603 7727 3952 Mobile /Whatsapp: +6012 568 4696 (Harn)
Full 4 days (**Recommended)		USD 1799 ()	
<ul style="list-style-type: none">The above investment price is for Per Delegate.This course is limited to 15 attendees to ensure that the course can remain interactive.Please note the Online Virtual instructor-led Training time zone will be as "Malaysia / Singapore" time zone (GMT+8).			
If you or your company is facing travel restrictions, we may be able to arrange the training at your preferred location for remote participation or conduct the training in-house with minimum 10 pax. Please contact intraining@petro1.com.my to discuss this possibility.			

Delegates Details

1. Name: _____ Mr Mrs Ms Dr

Job Title: _____

Email : _____

Contact No: _____

Department: _____

2. Name: _____ Mr Mrs Ms Dr

Job Title: _____

Email : _____

Contact No: _____

Department: _____

3. Name: _____ Mr Mrs Ms Dr

Job Title: _____

Email : _____

Contact No: _____

Department: _____

Head of Department: _____

Invoice Details

Invoice Attention to: _____

Company: _____

Industry: _____

Address: _____

Postcode: _____ Country: _____

Telephone: _____ Fax: _____

Email: _____

Authorized Signature : _____

Payment Method

By Direct Transfer: Please quote invoice numbers on remittance advice.

ACCOUNT NAME : PETRO1 SDN BHD

BANK : United Overseas Bank (Malaysia) BHD

ACCOUNT NO : 2609008514 (USD)

All bank charges to be borne by payers. Please ensure that PETRO1 SDN BHD received the full invoice amount.

CREDIT CARD PAYMENT

Credit card payment will include a charge 3%.

Payment Policy: Upon receipt of a completed registration form, it confirms that the organization is registering for the seat(s) of the participant(s) to attend the conference or training workshop. Payment is required with registration and must be received prior to the event to guarantee the seat. Payment has to be received 7 working days prior to the event date to confirm registration.

DATA PROTECTION

The information you provide will be safeguarded by Petro1 that may be used to keep you informed of relevant products and services. We take it seriously when it comes to protection of our client data.

TIME ZONE:

All our Online Virtual instructor-led Training time zone will be as "Malaysia / Singapore" time zone (GMT+8).

Cancellation & Substitutions:

Should you be unable to attend, substitutes are always welcome anytime at no additional cost. Please inform us as early as possible. Payment is non-refundable if cancellation occurs 7 working days prior to event commencement. However, delegates will receive a 100% credit on the amount paid which can be used in another PETRO1 SDN BHD training course for up to one year from the date of issuance. The credit is transferable to other persons in the same company and applicable against any future PETRO1 SDN BHD public course/ Online Live Webinar. If cancellation occurs 7 working days prior to the registration date and there is no substitute, the organizer reserves the right to charge 50% of the total investment from your organization.

In the event that, PETRO1 SDN BHD, postpones or cancels a course, delegate payments at the date of cancellation or postponement will be credited to a future PETRO1 SDN BHD course. This credit will be available for up to one year from the date of issuance, and it is transferable to other persons in the same company and applicable against any future PETRO1 SDN BHD public course.

PETRO1 SDN BHD is not responsible for any loss or damage as a result of a substitution, alteration or cancellation/postponement of an event. PETRO1 SDN BHD shall assume no liability whatsoever in the event this training course is cancelled, rescheduled or postponed due to a fortuitous event, Act of God, war, fire, labor strike, extreme weather or other emergency.

Program Change policy:

The organizer reserves the right to make any amendments and/or changes to the webinar, Date/ time, facilitator replacements and/or modules if warranted by circumstances beyond its control.

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