

# Advanced Solution to Transformer Life Cycle Management

Optimize your transformers life time cycle from spec. to scrap through implementation of life management and life extension strategies

6<sup>th</sup> – 8<sup>th</sup> November 2017 | Kuala Lumpur, Malaysia



**\*Don't trust your Lab's data**

**\*Don't trust your standards**

**\*Trust only the logic and the physical truth**

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In collaboration:

# Advanced Solution to Transformer Life Cycle Management (3 Days)

This 3-day workshop aims to provide a thorough understanding of transformer life management and life extension strategies. Understanding of transformer characterization and working principle will be the essential foundation before proceeding with development of management strategies. Overview of transformer design and mechanical construction will also be presented to give comprehensive representation of transformer's features. The trainer will also focus on the cycle from purchasing to commissioning of a new transformer as this will ensure the correct design and quality from beginning.

Following that, various implementations of new diagnostic techniques will be presented. Systematic and detailed studies on each diagnostic technique along with appropriate interpretation of these studies will lead to early detection of transformer failure. Subsequently, a certain degree of preventive actions can be implemented for such condition. This workshop will also include a study of "Substance assessment of transformer". **The relation of the technical assessment and financial assessment will also be covered in this training as engineers nowadays have to look after the financial point.**

Delegates will have an opportunity to learn useful methods to assess transformer's useful lifetime strength. Furthermore, acquisition of latest practical knowledge and application with regards to transformer optimization, i.e. "Optimized Asset Exploitation (OAE)" will also be one of the highlights of this workshop. **The course facilitator will attend to specific queries and provide practical recommendations for particular transformer condition.** Overall, this workshop will serve as a platform as an advanced course to answer the needs for optimized transformer operation in various industries.

## **MASTER the necessary knowledge and complexities of:**

- **UNDERSTANDING** basics knowledge about transformer design, variations, and types in order to understand the specific background.
- Critical evaluation measurement results for condition assessment
- **MAINTENANCE** strategies time base, event based, condition based in connection to the above the actual ageing condition will be clarified and the ageing behavior of transformers discussed.
- **How to understand and deal** with ageing behavior with preservation schemes and residual life time calculations.
- **ECONOMICS versus ECOLOGY** will be discussed in order to give the attendees also the necessary knowledge to defend the minor investment in monitoring and preservation as necessary effort in order to prevent their company from bigger losses by unforeseen break downs or even fatal catastrophes.
- **IMPROVE** life extension strategies and treatment ageing of transformer
- **EXAMPLE:** There will show on base of examples and case studies what is possible, what can be done and last not least, what is the profit of a well-planned Transformer population management.

**DURING THE 3 DAY SEMINAR** the trainer will be focusing on 5 crucial topics:

- Don't trust! Be able to understand right from wrong - (Be able to have your own judgment!)
- Really understanding your transformers condition - (Be on same level, as your partners from the OEM side)
- Optimize the maintenance - (Focus your maintenance on the real important things!)
- Avoid unnecessary actions - (Avoid Aimless activism)
- Focus on the real facts - (Believe is a forbidden word in engineering)

## **This program is intended for:**

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This workshop is specially designed for those who are involved in developing and implementing life maintenance strategies of transformers in their plant. These include:

- Maintenance Managers/ Supervisors/ Engineers
- Facilities Managers/ Supervisors/ Engineers
- Utility Managers/ Supervisors/ Engineers
- Plant Maintenance Head
- Plant Supervisors/ Managers/ Engineers
- Electrical Maintenance Managers/ Engineers
- Electrical and Test Managers/ Engineers
- Head of Engineering
- Manufacturing and Production Managers/Supervisors/Engineers
- Operations Managers/ Supervisors/ Engineers

# Advanced Solution to Transformer Life Cycle Management (3 Days)

## DAY 1

### Transformer life cycle management

- How to specify a transformer
- Cooling systems
- The new transformer a risk
- Transformer basics
- Transformer design.

### Purchasing transformers:

- Factory audit for prospective manufacturers
- Control points at manufacturing
  - Design control
  - Parts before active part completion
  - Pre-tanking inspection
  - FAT with fingerprints SFRA + FDS

### At and after commissioning:

- Control measurements including SFRA + FDS
- Control of gassing behavior
- Control of temperature behavior

## DAY 2

### Transformers in service and maintenance strategies:

#### Time based versus condition based maintenance:

- Understanding ageing condition and ageing accelerators like DGA and oil condition development under ageing conditions.
- Don't trust your Lab
- Understanding measurement results
- Dealing with the ageing accelerators
  - Improving of the life time and the reliability
- Transformer Maintenance
- Transformer treatments

### Mapping vs. Assessment

- Corrosive Sulphur PAS
- Water in Transformers
- Oxygen in transformers
- DP profiles
- Critical view on standards and limit values

## DAY 3

The case studies are focused on giving examples to the above discussed topics. On real examples will be shown, how wrongly understood limit values can produce false alarms on the one hand and wrongly maintained transformers will give harmless data, even they are found in critical condition.

- Several case studies focusing on the discussions in the first two days.
  - CO/CO2 cellulose destruction – no problem
  - Auxiliary transformers in several Power plants- life time evaluation/extension
  - Transformer failure root cause investigation -how to deal with the other identical units
  - GSU transformer failure understanding defending in front of insurance
  - Power plant auxiliaries health care planning
  - GSU transformers improving life time
  - Grid transformer which method for health care
  - Understanding condition of GSU transformers
- How to manage a transformer population
- EOL (End – of Life) conditions
- Tools and life time improvements
- Final discussion of issues from the attendees

### Conclusion



Energy1 is a sub-division of PETRO1 focus on provide trainings & technical Consultancy services. We help decision makers apply high level technical expertise to their daily task and strategic issues across a host of industries and disciplines including energy, manufacturing, maritime, defense, Aviation, Water treatment and chemicals. With this, we had successfully made impact to Energy professional mainly the Top 50 Energy players in the Asia Pacific Region

- |   |                                       |                              |
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| ▪ Metropolitan Waterworks Authority Thailand. | ▪ Star Energy Geothermal              | • Sandisk Storage            |
| ▪ Tenaga nasional berhad.                     | ▪ Perbadanan bekalan air pulau pinang | • Muehlbauer                 |
| ▪ San Fernando Electric Light & Power co, Inc | ▪ Aliran ihsan resources berhad       | • Dominant OPTO Technologies |
| ▪ Sarawak Energy                              | ▪ Visayan Electrical company          | • Finisar Malaysia           |
| ▪ SP Powergrid ltd.                           | ▪ Glow Company                        | • Sanmina System             |
| ▪ Power Seraya                                | ▪ Suruhanjaya Tenaga                  | • Bose System                |
| ▪ SMT Technologies                            | ▪ Indah Water Konsortium              | • Amkor Technology           |
|   | ▪ Jimah O&M                           | • EDMI Electronics           |
|   | ▪ Renesas Semiconductor               | • AUO SUNPOWER               |



### Georg's expertise

- Veteran expert with over 30 years of working in the transformers sector.
- Pioneer in the field of overaged transformers.
- Area of strength covers specifically in transformers conservation, life assessment, TPM, condition assessment, failure assessment, Root-cause assessment, refurbishment, manufacture audit, DP profile, Residual lifetime management, lifetime extension, lifecycle assessment, Maintenance improvement programme and many more.
- Worked with full range from small distribution transformers 6-20/0.4kV 400-3000 kVA to big transformer 220-800kV up to 800MVA in all applications.
- Previously work for some of the major transformer manufacturing company such as Maschinenfabrik Reinhausen, Siemens, and ABB.

Georg Daemisch has over 30 years of experiences in dealing with transformer management. Currently the Owner and Managing Director of DIDE GmbH (Daemisch Industriedienstleistungen GmbH) and DTC (Daemisch Transformer Consult) in Germany, he has successful track record in providing transformer consultancy all around the globe. His consultancy services exclusively specialize in the areas of condition assessment, ageing behavior, life enhancement and substance evaluation of medium to very large transformers. For each consultancy service, he conducts specific condition assessment to develop customized life management strategies suitable for the transformer. In various countries, he has provided consultancy services to a large number of transformer fleet owners. Through his roles in these major companies, he has gained comprehensive knowledge on different types of transformer, ranging from small to large power transformers.

### Eurotechcon

Being a renowned author in this field, Georg has published numerous papers in view of transformer life management. Some of his outstanding works are "The Aged Transformer Diagnosis, Treatment and Life Management, 2003-2004", "Ageing behavior, substance evaluation and conservation of power transformers, 2005", as well as "Transformer population Management (TPM), 2006." He has also been a regular presenter in various prestigious workshop and conferences in this industry, such as Eurotechcon 2009, CIGRE 2009, and many more.

### Early Days:

Georg was a graduate from Karlsruhe University, Germany as Dipl. Ing. In Electrical Power Engineering. His educational background had supported him in his early career stage and gave him opportunities to be lead sales engineer in major transformer manufacturing companies, such as Maschinenfabrik Reinhausen, Siemens, and ABB.

After working for several renowned manufacturers on generally international missions, he decided in the 90s of the previous century to pioneer the field of overaged transformers. Based on the general problem of moisture-logging in overaged oil-cellulose systems, he was instrumental in developing an understanding of the entire complex ageing process of these systems and for continuing the development towards a holistic population management. The experience gained from these projects are continuously added to the overall expertise and developed further for the customer's benefit.

**Georg Involvement in vary type of transformers application:** GSU, Rectif+ Feeder, Grid Coupler, Step up Eolic Parc, Substation, Grid, Furnance, Aux, Distribution, Rect, Distribution industrial, interbus couplet, traction, Power plant auxilleries, Rectifier, CHP, Power plant, Single phase banks, Auto and etc.

### **Companies which have benefited from his expertise include:**

**Europe:** ABB, Germany - Pechiney, Greece - Siemens, Germany - Solvay, Belgium - Vattenfall, Germany.

**Middle East and Africa:** ALBA Aluminum, Bahrain - BABCO, Bahrain - Div. El Companies, Egypt - EON Hydropower - Israel Electric Corporation, Israel - Khousestan Steel, Iran - Khuzistan Water and Power Authority (KWPA) Power Plants, Iran - Ministry of Electricity and Water, Dubai - Mobarakeh Steel Plant, Iran - Saudi Electricity Company, Saudi Arabia - Suweihat Power Plant, Abu Dhabi - TAVANIR, Iran

**Asia:** India Div. Power stations + substation transfers - Malakoff, Malaysia - PT April asia Sumatra, Indonesia - PT International Nickel Indonesia Tbk, Indonesia - Tenaga Nasional Berhad, Malaysia - Tuticorin, India.

# Registration Form

Advanced Solution to Transformer Life cycle management	Per Person	2 or more	<p><b>PROGRAM DETAILS</b>                  Venue: Kuala Lumpur                  Date: 6<sup>th</sup> – 8<sup>th</sup> November 2017</p> <p><b>REGISTER NOW</b>                  CONTACT: Kelvin                  MAIN: +603 7727 3952                  FAX: +603 7727 5278                  Email: registration@petro1.com.my</p>
Full 3 Days	SGD 2967 ( )	SGD 2437 ( )	
<ul style="list-style-type: none"> <li>Please note that all registrations must be made at the same time to qualify.</li> <li>The above price is inclusive of 6% GST.</li> </ul>			
( ) I would like to organize this training on-site and <b>save at least 25%</b> on the total course Fees! Please call +603 7727 3952 for more about our in-house training or email <a href="mailto:iht@petro1.com.my">iht@petro1.com.my</a> (Terms & Conditions apply)			

## Delegate 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 : \_\_\_\_\_

## Credit card Payment

**Please Debit my credit card:**

VISA     MASTERCARD

Card Number: \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_

Security Code:        Expiry Date:

Named printed on card: \_\_\_\_\_

Signature: \_\_\_\_\_

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

**GST input Tax claim**  
 Organization who have register under GST is allow to claim on any GST Incurred (Known as input tax) on their purchase to the business.

ACCOUNT NAME : PETRO1 SDN BHD  
 BANK : United Overseas Bank (Malaysia) BHD  
 ACCOUNT NO : 202 - 900 - 319 -1 (SGD)  
 SWIFT CODE : UOVBMKYL

**All bank charges to be borne by payers. Please ensure that PETRO1 SDN BHD received the full invoice amount.**  
**\* Credit card payment will include a charges 2.8%**

**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.

**Venue:** All of our training courses are held in 4 – 5 star venues. The course fee does not include accommodation or travel cost. It's recommended to book the hotel room early as there are only limited room available at the discounted corporate rate.

**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 come s to protection of our client data.

**Cancellation & Substitutions:** 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. Should you be unable to attend, substitutes are always welcome 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 a substitute is welcome at no additional charges. If cancellation occurs 5 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.

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.

**Walk in Registration:** Walk-in participants with payment will only be admitted on the basis of seat availability at the event and with immediate full payment.

**Program Change policy:** The organizer reserves the right to make any amendments and/or changes to the workshop, venue, facilitator replacements and/or modules if warranted by circumstances beyond its control.