IN-HOUSE WORKSHOP on

ENERGY AUDIT OF ELECTRICAL AND MECHANICAL SYSTEMS

Optimise

OPTIMAL SYSTEMS ENGINEERING SDN BHD

ENGINEERING SUSTAINABILITY

MyHS00015/22-E002

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01 WORKSHOP OVERVIEW

Technical energy audit involved detailed analysis and performance evaluation of energy systems and equipment within a facility, using a systematic approach, benchmarked against design standards or industry best practices. This in-house workshop aims to equip IOI Acid Chem personnel with the ability to conduct technical energy audits for electrical and mechanical energy systems. Participants will gain insights into electricity tariff selection, power factor improvement and electrical load management, as well as strategies to enhance energy efficiency for lighting, motors, transformers, pumps, and chillers.

02 WORKSHOP LEARNING OUTCOMES

By the end of this workshop, participants are expected to be able to:

- Analyse electricity load profile and assess cost-saving potentials through power factor improvement and load management.
- Identify energy efficiency improvement potentials for lighting, motors and transformers.
- Understand pump and chiller operation fundamentals, system characteristics, and scope for energy efficiency improvement.
- Apply measures for energy and cost savings based on industry best practices.

03 TARGET PARTICIPANTS

- Energy managers.
- Facility/maintenance managers or engineers.
- Industry personnel working on electrical and mechanical energy systems.

04 COURSE SCHEDULE

DAY 1		
DAY 1	**TIME**	**TOPIC**
DATE: TBC	8.30 am – 9.00 am	Registration
	9.00 am – 10.00 am	Electricity Tariff and Electrical Load Management
	10.00 am – 10.30 am	Tea Break
	10.30 am – 11.00 am	Electricity Tariff and Electrical Load Management
	11.00 am – 12.00 pm	Power Factor Correction
	12.00 pm – 1.00 pm	Energy Saving Potential for Electric Motors
	1.00 pm – 2.00 pm	Lunch Break
	2.00 pm – 2.30 pm	Energy Saving Potential for Electric Motors
	2.30 pm – 3.00 pm	Energy Saving Potential for Transformers
	3.00 pm – 4.00 pm	Energy Saving Potential for Lighting Systems
	4.00 pm – 5.00 pm	Electrical Energy Audit Methodology & Case Study

DAY 2		
DAY 2	**TIME**	**TOPIC**
DATE: TBC	8.30 am – 9.00 am	Registration
	9.00 am – 10.00 am	Chiller Fundamentals & Chiller System's Heat Loops
	10.00 am – 10.30 am	Tea Break
	10.30 am – 11.30 am	Performance Assessment and Audit of Chillers
	11.30 am – 1.00 pm	Energy Efficiency Opportunities for Chillers
	1.00 pm – 2.00 pm	Lunch Break
	2.00 pm – 2.30 pm	Fundamentals of Pumps
	2.30 pm – 3.00 pm	Pump Characteristics
	3.00 pm – 4.00 pm	Performance Assessment and Audit of Pumps
	4.00 pm – 5.00 pm	Energy Efficiency Opportunities for Pumps

05 TRAINERS' PROFILES

TRAINER 1

ASSOC. PROFESSOR IR. TS. DR DALILA MAT SAID

Ir. Ts. Dr. Dalila Mat Said is an Associate Professor at the Faculty of Electrical Engineering, Universiti Teknologi Malaysia (UTM) and Chair of the Resource Sustainability Research Alliance. She is a certified electrical trainer, Professional Engineer (BEM), Registered Energy Manager - Type 2 (Energy Commission), Certified Professional in Measurement and Verification, and Certified Energy Manager (AEMAS). With over 15 years of experience in power quality consultancy, electrical energy audit consultancy and training, she specialises in electrical energy management and system optimisation. Dr. Dalila holds B.Eng, M.Eng, and PhD degrees in Electrical Engineering from UTM. She is a Senior Member of IEEE (SMIEEE), an IEM graduate member, and a Professional Technologist (MBOT). Her research focuses on power quality, power system measurement, electrical energy management, renewable energy and smart agriculture technologies.

TRAINER 2

IR. DR. HAYATI ABDULLAH

Ir. Dr. Hayati Abdullah specializes in Thermodynamics, particular in the energy management and improvement of chiller and air conditioning systems and mechanical systems such as pumps, compressors, blowers and fans. She was trained in Energy Management in Sweden and is a Registered Energy Manager (REM) and a Certified Professional in Measurement and Verification (CPMV). Ir. Dr. Hayati is a Professional Engineer with Practicing Certificate (PEPC) registered with The Board of Engineers Malaysia, Chartered Engineer registered with The Engineering Council United Kingdom, Member of The Institute of Electrical & Electronics Engineering, USA and Past Chairman of The Institution of Engineers, Malaysia (Southern Branch). She has experience working as an Energy Management consultant for over 25 years & has worked in National Energy Conservation & Auditing projects including with international consultants such as ADEME from France.

OPTIMISE Energy Audit, GHG Accounting and EnMS Track Records

- Led UTM to be globally ranked 1st on SDG 7 - Affordable and Clean Energy
- Co-developer of ASEAN EMGS Energy Management System Standards with MGTC.
- Led UTM to win the ASEAN Energy Award and EMGS 3 Star EMGS Gold Standard.
- Involved in certification of energy managers and energy end users for 15 years.
- Developer of award-winning energy audit and energy monitoring software.
- Led UTM to achieve over RM 30 million energy savings between 2011-2023.
- Over 20 years experience in energy audit and optimisation consultancy, R&D and professional training for over 500 national/multinational companies.
- Certified trainer, auditors & centre for training & certification of energy managers.

Selected References

- Shell, Middle Distillate Synthesis
- BP – Amoco
- MLNG
- Felda Proctor and Gamble
- MIMOS Semiconductor
- Riau Pulp and Paper Mill
- Qatar LNG
- Pertamina Engineering Group
- PT Titan Petrokimia Interindo
- Pan Century, IOI Oleochemicals
- BASF – Petronas
- MTBE (Petronas)
- Huntsman Tioxide
- Malaysia Newsprint Industries
- Malaysia Palm Oil Board
- Malaysia Energy Commission
- Technip (M) Sdn Bhd
- PT Chandra Asri
- Petronas Penapisan (M) Sdn Bhd
- Petronas Gas Sdn Bhd
- Kaneka Malaysia
- UKM, UPM, USM, UM, MICET

20+

Years Experience in Energy Audit and Optimisation

#1

Global Rank in R&D on 'Heat Exchanger. Retrofitting and Design' Elsevier Scival 2014

500+

National & Multinational Companies Benefitted from our Energy Training Workshops

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