AC Motor and Variable Speed Drives - Principles, Maintenance, Troubleshooting, Electric Energy Saving With Online Demonstration Sessions

Training Programme
by
Faculty of Engineering
Multimedia University

Overview

This course is structured specifically to provide knowledge of induction motor and variable speed drives (VSD). More than 80% of the machines in industry run with the induction motor. For two reasons, starters are used for the motor, one for protection of people and second for protection of the motor itself. Even at this moment, there are still many motors running with electromechanical starters such as direct on line, star- delta etc. But recently, due to the rising concern in electric energy and the craving need for electric energy saving and better performance, VSD is gradually replacing electromechanical starters. In this course, the participants will be first given a thorough explanation on the induction motor to appreciate the importance of VSD. Secondly, the concept of VSD will be explained together with the sizing and selection procedures. The advantages and limitations of the VSD will be clearly explained. Last but not least, new problems found in power systems with VSD installed will be explained with their effect and mitigation issues. Practical sessions on setting up of VSD system, parameter setting, and troubleshooting and many more are included in this workshop.

Objective

1. To be able to troubleshoot and maintain the induction motor drives system.

2. To be able to improve efficiency of the induction motor system.

3. To be able to integrate and commission variable speed drives for induction motors.

Target Audience

Engineers, Technicians and Supervisors who are involved in the design, operation and maintenance of the induction motor and inverter. Recommended also for those who are fresh and interested to gain knowledge on inverters for induction motors.

Prerequisite

None.

Training Methodology

Online Classroom, Case studies, Online Practical Demonstration Using real Industrial Motor Drives and Pump System.

Course Duration

2 days (4 Hours Per Day).

Content/Outline

DAY 1

THE CONCEPT OF INDUCTION MOTORS

How does an induction motor work? What are the types of induction motors and where can we use them? How do you interpret speed torque characteristics? What are the techniques to control speed and torque?

PRINCIPLE OF VSD

The concept of frequency drives, Rectifier, Controlled Rectifier-Soft Starter, DC LINK, DC Link Capacitors- Ride Through Capabilities, Inverter, Braking Resistor, Converter Packages. Recent Developments in frequency inverter technology (Voltage/frequency, Flux vector control and Direct Torque Control) and their advantages and disadvantages. Harmonic Issues and mitigations. Sizing of Motor and VSD

DAY 2

ELECTRIC ENERGY MONITORING

How do you review energy consumption at your workplace? Calculation of Loading factor and Efficiency. How do you show reduction in electric energy saving by numerical values? How do you determine the payback period for a VSD system? How do you calculate the distorted power factor due to harmonics? Can a soft starter save electric energy? How does an inverter save electric energy?

TROUBLESHOOTING AND MAINTENANCE

What are the signs of failures in Induction motors and their remedies? How do you perform routine and periodic maintenance of the induction motors system? What are the new problems created with VSD based motor systems and ways to remedy them? How do you monitor the condition of an induction motor system? Minimum VSD Start up Procedure, identify fault in bridge rectifier, identify short-circuit fault in DC bus, identify fault in inverter bridge, test power transistor (IGBT), interpreting fault display.

Course Instructors

Ir. Dr. Gobbi Ramasamy

R. Gobbi received the Bachelor degree in electrical engineering from University of Technology, Malaysia, and the Master degree in technology management from the National University of Malaysia, and the Ph.D. degree in the area of torque control of switched reluctance motors from Multimedia University, Malaysia. He has been associated with technical education for more than fifth teen years. He was an electrician and R&D Engineer before becoming a Lecturer in electrical and electronics engineering. He has supervised many research projects on power electronics, variable-speed drives, automation, and domestic electrical installations. He is a project leader and member of various government research projects related to electric motors and drives systems. He is a consultant providing solutions for many problems associated with electric motors and drives systems for various industries. He has completed many energy auditing projects in industries. He has published more than 60 technical papers in international journals, conferences and magazines. He is an associate professor in the Faculty of Engineering, Multimedia University, Malaysia. His research interests are in reliability of electric motors, power electronics applications in energy industries, switched reluctance motor drives system and solar power application. Dr. Gobbi is a corporate member of the Institution of Engineers Malaysia, a professional engineer with a practicing certificate registered to Board of Engineers, Malaysia, Electric Energy Manager Registered to Energy Commission, Malaysia, and a Senior Member of Institute of Electrical and Electronics Engineers, US.

Administrative Details

Programme Logistics

Duration: 2 days

Date:
Please refer to the updated dates at https://www.mmu.edu.my/foe/short-courses/

Registration deadline:
Please refer to the updated dates at https://www.mmu.edu.my/foe/short-courses/

Your Investment

Condition		Price per Pax
Regular Fee	Students / MMU Alumni	RM350
	Public	RM450
	Public (Group >5 pax)	RM350
Early Bird Fee	Students / MMU Alumni	RM300
	Public	RM400
	Public (Group >5 pax)	RM300

Method of Payment

Please make payment via bank transfer only. Account details is as below:

Account name: Unitele Multimedia Sdn Bhd
Account number: 86-0090180-2
Bank: CIMB Islamic Bank Berhad

Payment must be made by the registration deadline.

Refund and Cancellation

Any refunds will be processed in 60 days. Should there be any cancellation, it may be due to the organizer not getting the minimum participants or the participant failing to attend the workshop due to unavoidable reason.

Disclaimer

Faculty of Engineering, Multimedia University reserves the right to change the instructors, date and to vary/cancel the programme should unavoidable circumstances arise. All effort will be taken to inform participants of the changes. Upon submission of the registration form, you are deemed to have read and accepted the terms.

Enquiries

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Registration Form

To register, please visit this link: https://forms.gle/UHy8Biz3zFKSBQjw5